

Recommendations and Best Practices to Develop a 2050 Pathway / Long- Term Low-carbon and Climate Resilient Strategy (LTS) for Jordan

FINAL FOR DISCUSSION



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Abbreviations

Abbreviation	Definition
AFD	Agence Française de Développement
AFOLU	Agriculture, Forestry, and Other Land Use
AJYC	We Are All Jordan Youth Authority
BAU	Business-as-Usual
BBB	Build Back Better
BRT	Bus Rapid Transit
BUR	Biennial Update Report
CAP	Climate Action Plan
CBA	Cost-Benefit Analysis
CCICD	Climate Change and International Cooperation Division (of Fiji)
ccGAP	Climate Change Gender Action Plan
CCS	Carbon Capture and Storage
CCD	Directorate of Climate Change or Climate Change Directorate
CE	Citizen Engagement
CNTE	Council for the Energy Transition
COP	Conference of Parties (of the UNFCCC)
CSO	Civil Society Organisation
EDP	Economic Development Plan
EE	Energy Efficiency
ENPEP-BALANCE	Energy and Power Evaluation Program (Model)
ESIA	Environmental and Social Impact Assessment
ETF	Enhanced Transparency Framework
EU	European Union
EV	Electric Vehicle
FAO	Food and Agriculture Organisation (of the United Nations)
GACMO	Greenhouse Gas Abatement Cost Model
GAM	Greater Amman Municipality
GAMMA	Gender Assessment Method for Mitigation and Adaptation
GAP	Gender Action Plan
GC	Government Council
GCF	Green Climate Fund

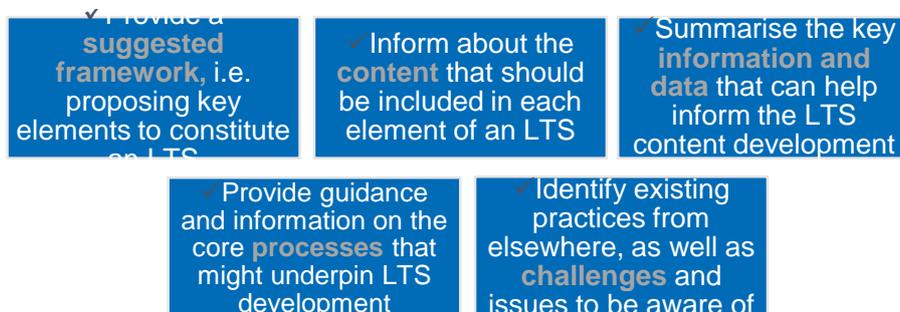
GDP	Gross Domestic Product
GEF	Global Environment Facility
GG-NAP	Green Growth National Action Plans
GHG	Greenhouse Gas
GIEP	Government Indicative Executive Plan
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IMC	The Inter-Ministerial Committee for Women's Empowerment
INC	Initial National Communication
INDC	Intended Nationally Determined Contributions
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Processes and Product Use
IRENA	International Renewable Energy Agency
IUCN	International Union for Conservation of Nature
JD	Jordanian Dinar (currency)
JEF	Jordan Environment Fund
JEGP	Jordan Economic Growth Plan
JHCO	Jordan Hashemite Charity Organization
JNCW	Jordanian National Commission for Women
JREEEF	Jordan Renewable Energy & Energy Efficiency Fund
JRP	Jordan Response Plan
LEAP	Low Emissions Analysis Platform
LT-LEDS	Long-Term Low Emissions Development Strategy (synonymous with LTS)
LTMS	Long-Term Mitigation Scenarios
LTS	Long-Term Low-Carbon and Climate Resilient Strategy (synonymous with LEDS)
LULUCF	Land Use, Land Use Change, and Forestry
LWGP	Lima Work Programme on Gender
MEMR	Ministry of Energy and Mineral Resources
MENA	Middle East and North Africa
MIT	Ministry of Industry and Trade
MoA	Ministry of Agriculture
MoE / MoEnv	Ministry of Environment
MoH	Ministry of Health

MoT	Ministry of Transport
MoPIC	Ministry of Planning and International Cooperation
MoLA	Ministry of Local Administration
MRV	Monitoring, Reporting and Verification
NCCC	National Committee on Climate Change
NCCRP	National Climate Change Response Policy
NDC	Nationally Determined Contributions
NGGP	National Green Growth Plan
NGO	Non-Governmental Organisation
OECD	Organisation for Economic Co-operation and Development
PB	Participatory Budgeting
PMR	Partnership for Market Readiness
PMU	Project Management Unit
PPP	Public Private Partnership
QA	Quality Assurance
RCP	Representative Concentration Pathway
R&D	Research and Development
RE	Renewable Energy
RICCAR	Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region
RMI	Republic of the Marshall Islands
RSS	Royal Scientific Society of Jordan
RWH	Rainwater Harvesting
SDGs	Sustainable Development Goals
SE-CAP	Sustainable Energy and Climate Action Plan
SMART	Specific, Measurable, Achievable, Realistic, and Timebound
TCCA	Transparency, Completeness, Comparability, Consistency, and Accuracy
TIMES	Integrated MARKAL-EFOM System Model
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization

USAID	United States Agency for International Development
USD	United States Dollar
WAJ	Water Authority of Jordan
WHO	World Health Organisation
WRI	World Resources Institute

About this document

This document is intended as a reference guide to support the government of Jordan and its partners in the LTS development process. The roadmap provides guidance and recommendations in the following ways:



The Roadmap is intended to be a **starting point from which to develop Jordan's LTS** providing guidance on the process and suggestions on the content. It is not intended to be seen as the only way to develop an LTS, nor as prescriptive guidelines for Jordan's LTS' development process or content.

Structure of the Roadmap

The Roadmap is divided in 3 main parts which the reader can consult depending on their needs. Hyperlinks have been embedded for ease of access. These are:

INTRODUCTION: An LTS in the context of Jordan

The Introduction provides a summary of Long Term Strategies in the Jordanian context, including:

[The international context](#), explaining the recommendation to develop a LTS, common elements and alignment with other climate change commitments and strategies.

[An LTS in the context of Jordan](#), summarising the key challenges and opportunities for an LTS

PART A: For recommendations on the *content* of the LTS

Provides recommendations on the content of the LTS (i.e. its different elements and the content of these elements). It is structured to align with key elements of a LTS:

[National Circumstances](#), including relevant background information and context to develop this section

[Long-Term Vision](#), including a summary of existing visions, suggested structure and vision statement

[Long-Term Adaptation and Mitigation Strategy](#), including a suggested approach to structuring the strategy in light of key mitigation and adaptation needs arising from the analysis

PART B: For recommendations on the *processes* to develop the LTS

Provides recommendations on key processes underpinning the development of the LTS, specifically:

[Institutional arrangements](#) needed to develop the LTS and recommended structures and functions

[Citizen engagement](#) needs and opportunities, and recommended approaches

[Stakeholder engagement](#) needs and recommendations for stakeholders to engage

[Implementation of the roadmap](#), including a summary of the phasing of activities for LTS development, including timeline and resources needed

Notes on the structure

To simplify the organization of this roadmap, the **development needs** (Part B) have been separated from the technical inputs and **content** (Part A). Part A mirrors the main contents of an LTS for ease of use, whereas the elements presented in Part B cut across the entire development process. However, there are two important considerations for LTS develop using this roadmap:

Firstly, there is important interplay between these section which is important to note in the development of the LTS. For example, modelling and scenario development will be informed by national priorities, and, depending on who leads or is engaged in the analytical work, different priorities, policies, and solutions may take precedent. To the extent possible, **it is therefore advisable that the technical process remains transparent and that all affected stakeholders have the opportunity to engage either in the process itself or at least in the results.**

Secondly, **there are important cross-cutting elements which have not been presented in a standalone section due to their integrated nature.** These include, for example, gender mainstreaming and sustainable development goals. Therefore, **these considerations are integrated throughout the document and not as a standalone section** This is intended to support their mainstreaming into the LTS process.

See below box on gender for specific details of this.

Supporting Annexes:

Annexes to this document also provide more details and background to each of the elements from Parts A and B, namely:

1. An overview of the national circumstances
2. A report on Jordan's long-term vision
3. A preliminary Vulnerability and Risk Assessment
4. Recommendations for modelling tools and mitigation pathways
5. Governance and institutional arrangements
6. A citizen engagement plan
7. Opportunities for gender mainstreaming
8. An MRV system for tracking the implementation of the LTS
9. A stakeholder engagement plan

Gender mainstreaming

Gender is an element critical at all stages and in all processes of the LTS, and as noted above, is **integrated throughout the LTS** (symbol is used to identify this). For example:

- Gender equality remains a **challenge** for Jordan and is this is discussed in section 2.1 [Political economy and existing challenges](#)
- Gender equality is an important element of **national circumstances**, and therefore should be both included within the national circumstances of the LTS, and factored into the development process. Key context is briefly presented in section 3.4.4 [Gender mainstreaming](#)
- Gender mainstreaming is vitally important to the **LTS vision**, and visions and goals from national strategies are included in section 4.4 [Information to develop Jordan's long-term vision](#), forming a key part of the suggested vision themes in section 4.5 [Recommendations for the LTS vision](#)
- Ensuring gender equality and opportunities are promoted and mainstreamed should be a key consideration in the development of the **climate strategy**. The overarching approach integrates gender (see section 5.5.1). Section 5.5.4 [Action criteria and justification for the criteria](#) also fully integrates gender a key element.
- Gender equality is also important as part of the LTS process, including ensuring equal opportunity to participate in **engagement processes**. Gender is therefore a key factor in [Recommendations for the citizen engagement approach](#) (section 8.5)
- Lastly, there is a need for engagement on gender within the LTS development and later implementation as part of the **institutional structure**, therefore section 6.5 [Recommendations for Jordan's institutional and governance arrangements for the development](#) includes information on a gender task force.
- A **standalone annex** on 'Opportunities for gender mainstreaming' is also included (**Annex 7**) which provides a more comprehensive overview.

Navigation

Before each section, a “Navigation” box provides easy access to each sub-component. Throughout the Roadmap, boxes such as the one below will help the reader in directly accessing the information required:

Navigation



Within section of the roadmap, the contents follow the same structure. Using the same structure intends to help reader find to the most relevant section for their needs, and colours and icons are used as follows to easily identify background and guidance, recommendations, Jordan-specific content, and challenges:

1.1. Role of the element in the LTS

- Summarises the purpose of this element within the LTS, why might be important and what it aims to do

1.2. International examples

- Looks at how have other countries have addressed this element, approaches taken and examples that could be drawn upon

1.3. A recommended framework or approach to the LTS element

- Looks at how Jordan could approach this element in the LTS, and the key messages, goals, characteristics or other features that Jordan might want to highlight

1.4. Background or core information relevant to this element for Jordan

- Summarises the key information or data gathered during the LTS roadmap development process that might be relevant for the development of this element

1.5. Recommendations for Jordan

- Provides a summary of the main recommendations or suggestions, for example themes for the vision, or pillars for the climate strategy, based on the reviewed information

1.6. Challenges and bottlenecks to consider

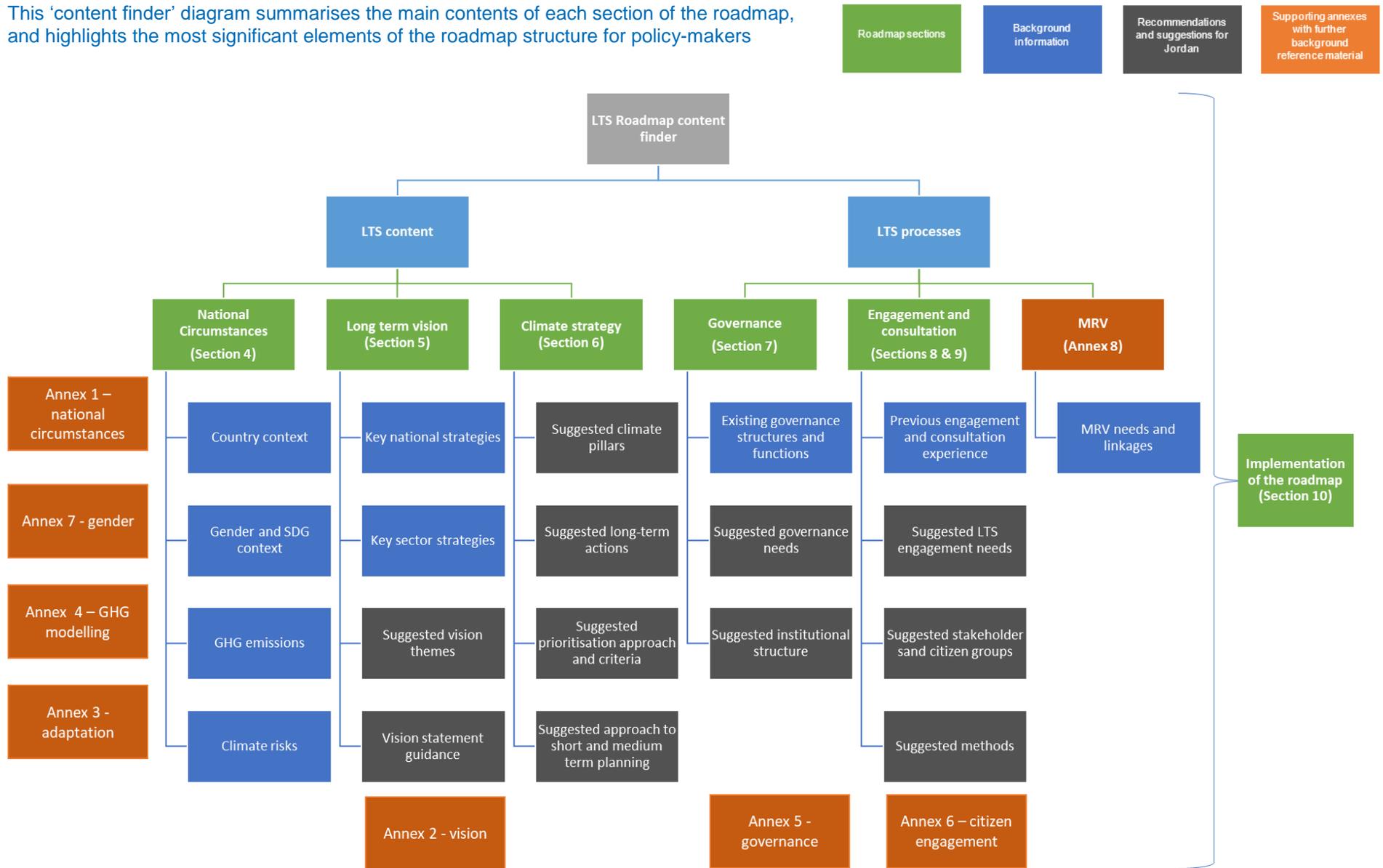
- Summarises the limitations of the work, and potential issues that might be encountered, that will be useful to plan for in the LTS development



Lastly, where there is further information, analysis or details contained in an annex, these are signposted to as follows:

**More information
in Annex X**

This 'content finder' diagram summarises the main contents of each section of the roadmap, and highlights the most significant elements of the roadmap structure for policy-makers



INTRODUCTION: AN LTS IN THE CONTEXT OF JORDAN

Navigation

This section provides a summary of Long Term Strategies and the Jordanian context, including:



Section 1: [The international context](#), provides a summary of Long-Term Strategies under the Paris Agreement explaining the recommendation to develop a LTS, common elements and alignment with other climate change commitments and strategies. It includes:

- [Common elements of LTSs and approaches to date](#)
 - o Country approaches and common LTS elements
- [Aligning the LTS with other climate change activities](#)
 - o Linkages between the LTS, NDC, NAP and national development strategies
- [A living document](#)
 - o Reflections on future update needs

Section 2: [An LTS in the context of Jordan](#), summarising the key challenges, political economy and opportunities for an LTS in Jordan. It includes

- [Political economy and existing challenges](#)
 - o Overview of past and current challenges and pressures relevant to the framing of an LTS
- [Jordan's climate change activities](#)
 - o The history of climate change response in Jordan
- [Role of the LTS in Jordan](#)
 - o The opportunities an LTS might provide for Jordan's long-term policy and planning
- [LTS development](#)
 - o Suggested principles for the LTS development approach and suggested framework and structure

1 Long-Term Strategies – the international context

UNFCCC Decision 1/CP.21 invites countries to communicate, by 2020, a “mid-century, long-term low GHG emission development strategy”. This is enshrined in Art 4.19 which stipulates that all Parties should strive to formulate and communicate long-term low GHG emission development strategies.

These “mid-century long-term low GHG emissions development strategies” (LT-LEDS) also known as a long-term strategy (LTS), are central to achieving the goal of limiting warming and preventing some of the worst impacts of climate change.

Parties should also be “*mindful of Article 2 taking into account their common but differentiated responsibilities and respective capabilities, in the light of different national circumstances*” when preparing their LTS¹. Article 2(b) is concerned with ‘*Increasing the ability to adapt to the*



“Long-Term Strategy” or “LTS” is the term used in this roadmap, particularly in referring to such a strategy for Jordan, encompassing low-emission 2050 pathways, climate resilience and national development goals.

¹ UNFCCC, Communication of Long-Term Strategies <https://unfccc.int/process/the-paris-agreement/long-term-strategies>

adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production’.

LTSs therefore play a key role in the transition toward both climate resilient and low emission economies, that also support national development objectives.

In its First Nationally Determined Contribution (NDC) the Hashemite Kingdom of Jordan proposed to reduce its GHG emissions by a total of 14% by 2030. Alongside this, the Government of Jordan has committed to specific actions on climate change and has proactively introduced NDC priorities into sectoral policies for energy, water, transport, and urban sectors. These actions will support the delivery of the 2030 target. However, there is a need to also consider what actions may be required **over a longer timescale**, as part of Jordan’s transition towards a climate resilient low emissions economy.

Beyond meeting the goals of the Paris Agreement, development of an LTS can also serve a number of valuable domestic purposes. For example:

- An LTS can also act as an **overarching socioeconomic development strategy**, integrating climate change considerations amongst other issues. A meaningful climate strategy needs to ensure it aligns / incorporates a broader development strategy covering the same time period (and vice versa), and so the LTS process provides an opportunity to develop this.
 - ➔ *This broad approach to LTS development is supported by the overall approach recommended in this roadmap: to ensure it aligns to the national circumstances and needs (see section 3); to avoid duplication across country strategies, mainstream climate considerations in a holistic unified approach under a collectively agreed country vision (see section 4); and utilise a ‘climate pillars’ approach to ensure comprehensive coverage and integration of all long-term strategic issues (see section 5).*
- The process of developing an LTS allows the government and its citizens to **collectively decide what future they want** for their country while meeting sustainable development priorities and safeguarding the climate
 - ➔ *The citizen and stakeholder engagement approaches for LTS development provided in this roadmap (see sections 7 and 8) provide suggestions on opportunities for enhancing engagement and decision-making*
- Long-term strategies are crucial to ensuring that countries’ **near-term actions are consistent with their ultimate goals** – an LTS can put short-term actions into context
 - ➔ *The long-term adaptation and mitigation strategy approach suggested in this roadmap (see section 5) provides a suggested framework for defining long-term ‘pillars’ to link to short term actions*
- Focusing only on short- and medium-term targets (such as 2020 or 2030) **could keep countries from making the fundamental changes they need**, and make decarbonization costlier and more difficult over the longer term
 - ➔ *The action criteria approach suggested in this roadmap (see section 5) provides an example framework for ensuring that action impacts and benefits over the long term can be qualitatively or quantitatively assessed to minimise risks*
- Long-term strategies can help governments to **recognise climate-related risks**, both from direct impacts, and from the low-carbon transition itself, which could sharply devalue high-carbon assets.
- Long-term strategies can help countries to unlock new economic opportunities, innovate, and create the jobs of the future. An effective LTS process can point to actions that can achieve the triple dividend of creating jobs and enhancing inclusion in the short and medium term
 - ➔ *The National Circumstances (see section 3) highlights the key challenges currently facing Jordan. The long-term adaptation and mitigation strategy approach and action criteria in this roadmap (see section 5) provides a suggested framework for ensuring benefits can be maximised.*

while strengthening long term sustainability. This is particularly relevant in the context of COVID-19 recovery

The benefits of long-term planning are particularly relevant for Jordan, where most national plans and strategies are focussed on short and medium-term goals. **Therefore, the development of Jordan's LTS represents an opportunity to shift decision-making and strategic thinking to the longer-term perspective.**

1.1 Common elements of LTSs and approaches to date



While all Parties should strive to formulate and communicate their LTS, only 29 Parties have submitted an LTS to the UNFCCC². While UNFCCC Decision 1/CP.21 invites countries to communicate an LTS, it does not define in any detail what the LTS should contain, resulting in varied approaches.

There are no established guidance, best practices or 'one size fits all' approaches to LTSs, hence, it is important that an LTS is country driven.

The structure and length, as well as the content, of LTSs produced to date exhibit significant variation. While many countries choose to detail a singular set of actions they intend to take to reach their 2050 goal, others take alternative approaches, e.g.:

- **Fiji** - provides multiple future emissions scenarios and then details the actions required to achieve each.
- **Costa Rica, Fiji** - link their LTSs to other relevant policies/documents (e.g. NAPs and NDCs) and use the LTS to build upon these policies and enhance their ambition.
- **Norway, Japan** - take a more "off the shelf" approach, where their LTSs are largely just documentation of existing policies framed under a new long-term vision.

The more comprehensive LTSs tend to clearly and thoroughly document the key challenges they expect to face, and the institutional arrangements and governance structures designed to ensure successful implementation.

In line with the agreement to pursue efforts to limit warming to 1.5°C, many countries have defined their LTS around via a quantified mitigation target for 2050 (often net-zero emissions by 2050, or heavily reduced emissions coming close to this goal). However, variety in the national circumstances of different countries means this mitigation-focused approach is not ubiquitous amongst LTSs – some countries with high climate vulnerability (and often relatively low emissions) may choose to prioritise adaptation efforts in their LTS (an "adaptation-first" or "climate resilient" approach, e.g. Uganda). Often, a combination of these two approaches is taken, with countries defining a long-term mitigation target and then linking this target to complementary adaptation efforts (or a national adaptation plan; NAP) and considering the potential for synergies between the two (examples of this approach are provided by the LTSs of Fiji and Costa Rica).

Existing examples of LTSs do not necessarily represent best practice. There are limited examples available so far, and as such, those reviewed and included in this document represent only existing practices (as opposed to 'good' practices).

However, a number of common elements feature in the LTSs that have been prepared by other countries, and in the literature, which can provide inspiration for what Jordan's LTS may include:



² UNFCCC (no year), "Submitted Long-term Strategies": <https://unfccc.int/process/the-paris-agreement/long-term-strategies> last checked:18/06/2021

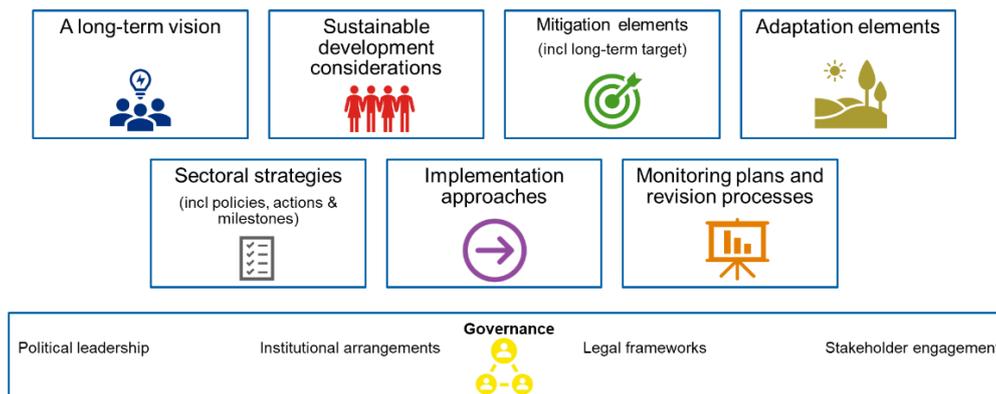


Figure 1-1: Common elements of an LTS

Source: Developed by Ricardo Energy and Environment

1.2 Aligning the LTS with other climate change activities

The LTS is not intended to be an “implementation plan” but a strategic document that guides other national climate and sectoral strategies. By providing the framework for the identification and prioritisation of the necessary actions to deliver the country’s long-term climate change and development vision, **short and medium-term climate change and sectoral plans can ensure actions are aligned to long term objectives.**

Figure 1-2 below, for example, shows how the LTS should ideally interact with the NDC and NAP processes, and also align with the government vision and national development plans. The NDC and NAP processes, implementation plans, and local climate action plans can **provide the vehicle by which implementation of climate action is driven**, and thus reported under the national transparency framework.



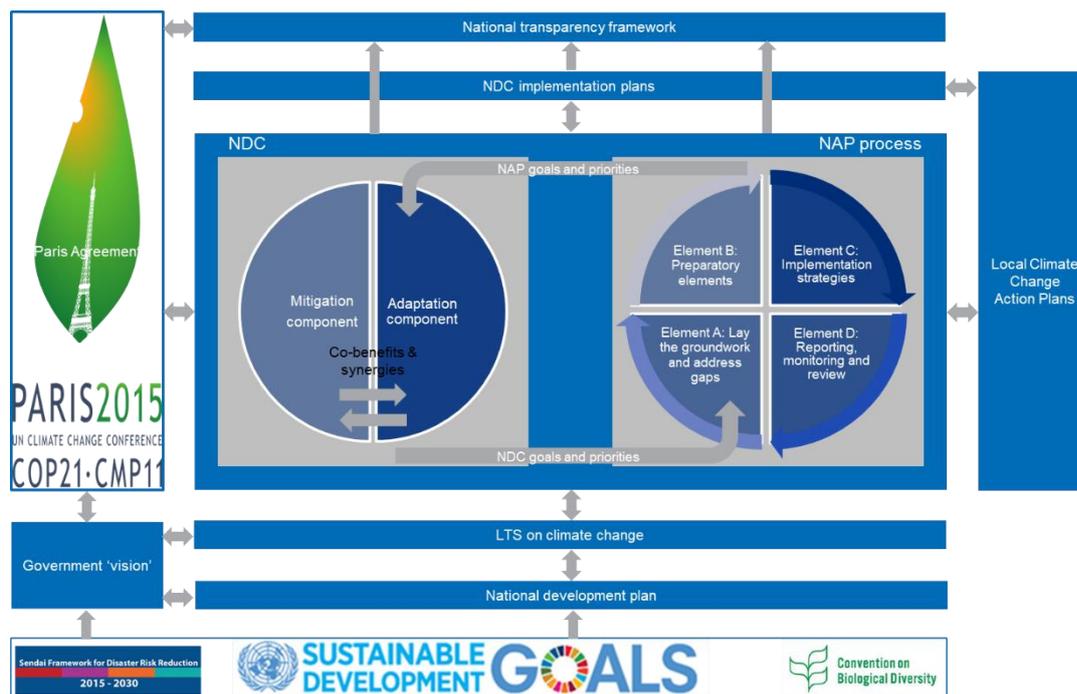


Figure 1-2: Linkages between different country and international climate and development processes

Source: Smithers et al. (2017)³

1.2.1 Nationally Determined Contributions

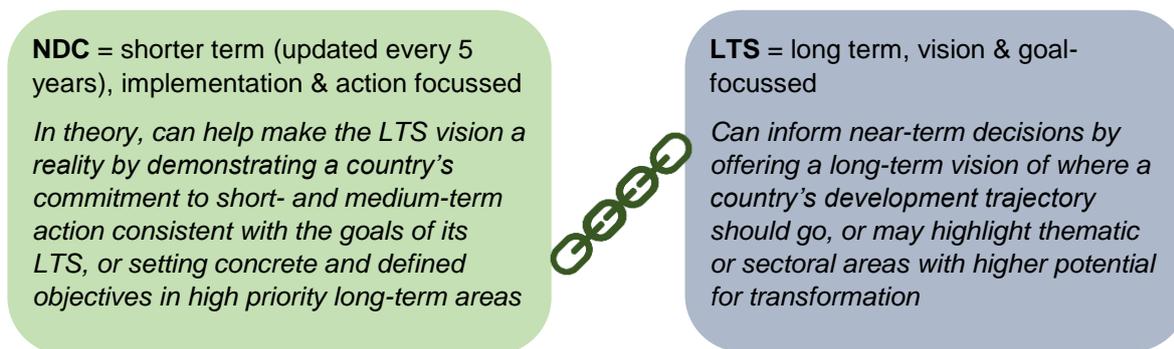
NDCs can be considered the 'implementation plan' to the LTS. NDCs set out countries' medium-term targets, which are aligned to the LTS pathway and therefore ensure the country will achieve its goal. LTSs provide the opportunity to 'go further' than the NDC through their longer time horizon, and ensure there is a clear link between medium-term targets, and actions required to achieve to a longer-term vision and development pathway. However, as NDCs have generally not been considered ambitious enough to achieve the reductions in emissions that science demands is necessary⁴, LTSs are also a crucial opportunity to bring national action in line with the efforts necessary to achieve more ambitious global targets of limiting temperature warming to 1.5 degrees. Setting an ambitious long-term mitigation goal as part of the LTS vision and mitigation strategy is one way to drive this and should inform future NDC updates.

The below figures outline the basic concept on how NDC revision cycles can be informed.

³ Smithers, R.J.; Shabb, K.; Holdaway, E.; Sanchez Ibrahim, N.; Rass, N. and Olivier, J. (2017) *The role of the National Adaptation Plan (NAP) process in translating (Intended) Nationally Determined Contribution, (I)NDC adaptation goals into action*. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Bonn. 84pp. <http://www.adaptationcommunity.net/wp-content/uploads/2017/10/The-Role-of-the-NAP-Process-in-Translating-NDC-Adaptation-Goals-into-Action.-Linking-NAP-processes-and-NDCs.pdf>

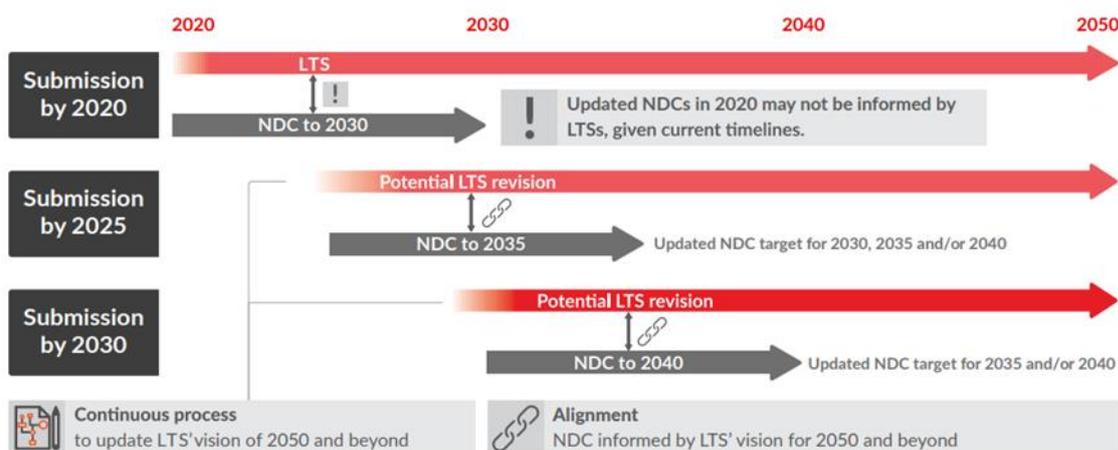
⁴ See for example, analysis here: <https://climateactiontracker.org/global/cat-emissions-gaps/>

Figure 1-3: Roles and linkages between the NDC and LTS



Source: Developed by Ricardo Energy and Environment

Figure 1-4: NDC and LTS process. Aligning interim targets can help ensure coherence



Source: GIZ (2020)⁵

1.2.2 Adaptation in Long Term Strategies

Whilst an LTS is framed by the Paris Agreement as a “mid-century, long-term low greenhouse gas emission development strateg[y]”, predominantly intended to support mitigation goals, countries are encouraged to be “mindful of Article 2 taking into account their common but differentiated responsibilities and respective capabilities”.

There is growing recognition that the LTS should be aligned to national climate priorities, and for many countries the priority is enhancing resilience to climate change. The WRI recommends that LTSs should include adaptation elements, stating that: “Integrating climate change adaptation into long-term planning is key to securing social and economic development, as the impacts of climate change are already affecting development outcomes”. This integration is considered to be “of most interest to developing countries with high (and/or rapidly increasing) emissions and major vulnerabilities. It is perhaps here that mitigation/adaptation integration should *start*.”⁶.

⁵ GIZ (2020), “Making Long-Term Low GHG Emissions Development Strategies a Reality. A guide to policy makers on how to develop an LTS for submission in 2020 and future revision cycles”: https://2050pathways.org/wp-content/uploads/2020/06/GIZ_NewClimate_LTS_GuideForPolicyMakers_2020.pdf

⁶ Simon Anderson (2020), “Choices in the Integration of Climate Adaptation in Long-Term Climate Mitigation Strategies (LTS), and Strengthening National Adaptation Plans”. World Resource Institute. Available at: <https://www.wri.org/climate/expert-perspective/choices-integration-climate-adaptation-long-term-climate-mitigation>. (emphasis was added)

As the integration of mitigation and adaptation is only just starting, there are few examples on which Jordan can rely. As of October 2019, no LTS had set adaptation targets nor considered adaptation actions⁷, and this has not greatly improved.

However, ensuring that adaptation is inherent to an LTS is key to ensure that efforts are undertaken to reduce a country's vulnerability to climate change, as integration in long-term planning will incentivise consideration in short- and medium-term strategies. This is particularly relevant to focus on in vulnerable countries contributing less than 1% of total GHG emissions. Adaptation also ensures that:

- (i) Mitigation efforts will not increase vulnerability in other sectors and lead to maladaptation, as may be the case with some key mitigation actions if considered in isolation (such as through the use of hydraulic energy), and that
- (ii) Mitigation efforts will not be vain, as impacts from climate change may damage energy infrastructure or bring the country's economic and social foundations to a standstill.

Moreover, an LTS also has an objective to sustainable socio-economic development, which cannot occur without adapting to climate change as the impacts on vulnerable sectors and groups exacerbate poverty, and vice versa. For these reasons, countries such as Uganda are currently developing their LTS from an "adaptation-first" perspective⁸.



1.3 A living document

“By making the LTS development an ongoing exercise in creating a vision for the future of a low emissions economy as part of a continuous planning process, policy makers can enhance the LTS’s scope, depth and robustness over time.”

It is important that the LTS is not viewed as a one-time exercise, but as a living document. The Paris Rulebook only reiterates the invitation to communicate an LTS by 2020, without specifying requirements for future updates. However, LTSs should be about the *continuous planning process* for two reasons:

1. The LTS should aim to support integration of a long-term climate goal with existing plans, providing a longer-term pathway and strategic direction. This helps to ensure consistency and robustness of policy making and that short-term responses are aligned to the long-term vision. A continuous planning process can therefore build upon regularly updated analyses and extensive public and private stakeholder engagement to ensure the vision of the LTS is always reflecting priorities and is fit for purpose.
2. A regularly updated strategy offers the opportunity for updates and responses to changing science and national priorities. A one-time submission in 2020 without further revision would dismiss the idea to make an LTS an ongoing exercise in creating a vision for the future of a resilient and low emissions economy *informed by latest science*. Planning for future updates leaves the door open for adoption of new technologies, responding to new challenges, trends, climate impacts, sectoral priorities, or increasing efforts where it is shown this is needed (e.g. international mitigation goals).

⁷ OECD (2019), “Key questions guiding the process of setting up long-term low emissions development strategies”. Available at: <https://www.oecd.org/environment/cc/Key-questions-guiding-the-process-of-setting-up-long-term-low-emissions-development-strategies.pdf>

⁸ Lessons learnt from this process are reflected throughout this Roadmap.

2 An LTS in the context of Jordan

Jordan's LTS will provide an opportunity for the country to collectively identify their goals and priorities in relation to climate change and development. The LTS has the potential to address a number of existing challenges and provide new opportunities, namely:

- Providing an opportunity to engage citizens, stakeholders and decision makers in climate change, building knowledge and awareness around a shared vision.
- Placing climate change on the highest political agenda and providing a framework for adoption and mainstreaming of climate priorities across all sectors and strategies.
- Providing a new, inclusive, participatory, long-term vision and pathway to support other planning and decision-making processes, and in particular ensuring short-term responses remain aligned to long-term goals.
- Bringing together existing work on climate change under one banner, demonstrating linkages between sectoral plans, climate policies, NDCs, NAPs, and long-term priorities.
- Sending a clear signal to investors, businesses, partners and other actors of the direction of the country's future development.

Ensuring the LTS considers the challenges and constraints Jordan faces – outlined below – and identifies Jordan-specific solutions to these will be key.

2.1 Political economy and existing challenges



“By failing to prepare, we are preparing to fail.”

Jordan's recent history and associated policy responses has been shaped by a series of crises – from energy to refugees and now a pandemic. The responses to these crises have by necessity been reactive – identifying ways to manage and respond to these external pressures. Jordan continues to face a number of challenges, driven by demographics, geography, and politics, and these form important context for the LTS.

Socio-economic challenges: Jordan faces several challenges due to the country's demographics, in particular a significant proportion of refugee population relative to its size: Jordan has around 4 million refugees from various origins. Approximately 80% of the Syrian refugees in Jordan live in urban areas in the north of Jordan, while the remaining 20% live in the Za'atari, Mrajeeb al-Fahood, Cyber City, and Al-Azraq camps. This has placed a huge burden on the country's infrastructure, public services, and natural resources. The annual cost of providing for the refugees is roughly USD 2.9 billion (8% of Jordan's GDP), according to government data, of which only 5.5% has been covered by the international community⁹. The arrival of more than 200,000 Syrian workers (around 10% of Jordan's workforce), when combined with the estimated number of foreign workers in Jordan, who are mostly from the region, puts estimates of non-citizens in Jordan at over 5 million—potentially around half of Jordan's total estimated population. It has been suggested that this refugee influx could cause downward pressure on wages¹⁰. However, it is important to note that some studies suggest no negative impacts of refugees on labour market outcomes for locals, including wages¹¹.

The Jordanian economy is one of the smallest economies in the region. The structure of Jordan's economy makes it highly vulnerable to external shocks, as the country is deeply linked to the global economy, importing around 90 percent of its food items and energy requirements and highly dependent on regional exchanges for water. The service sector contributes over 70% of the Gross Domestic Product (GDP) and 75% of jobs, but creates little activity of added value, while the country's industrial

⁹ Jordan's First Biennial Update Report to the United Nations Framework Convention on Climate Change, 2017, https://unfccc.int/files/national_reports/non-annex_i_parties/biennial_update_reports/application/pdf/jordan_bur1.pdf

¹⁰ Correspondence with local partners

¹¹ Fallah, B., Krafft, C. and Wahba, J. (2019), 'The impact of refugees on employment and wages in Jordan', *Journal of Development Economics*, vol.139, pp. 203-216. Accessed from: <https://www.sciencedirect.com/science/article/abs/pii/S0304387818310344>

base remains narrow¹². A lack of natural resources, a high population growth rate, the ongoing regional conflicts, the rising cost of health care, and the growing expectations of people have posed challenges to the country's sustainable social and economic development.

The Syria crisis is having an extended adverse effect on Jordan's economy. The crisis has gravely hit Jordan's fiscal situation. It has put pressure on the delivery of basic services to the people, Jordanian citizens and refugees alike, in a country already suffering from scarcity of natural resources and from pre-existing vulnerabilities in its delivery systems. It has impacted its infrastructure, and has rendered critical the need for a large and ambitious agenda to help the country face the threat of economic and social destabilization. Jordan's response is a developmental one, with a focus on investing in and upgrading the country's structures thus strengthening the country's resilience.

There has been little regional policy-making and cooperation on climate change with neighbouring States. Regionally, it has sought to cooperate with Israel and Syria on water, but both countries have violated agreements and overused water to the detriment of Jordan.

Energy challenges: With energy, Jordan is attempting to diversify its providers of fossil fuels while increasing its domestic production of renewable energies (particularly wind and solar). Acceleration of economic development and rising standards of living have made energy security a top priority. The issue of securing energy is particularly challenging for Jordan, which suffers from scarcity of natural resources, combined with the regional instability and conflicts. Jordan's energy security has been historically linked to its relations with neighbouring countries and is thus vulnerable to external shocks and outside political events. Despite the reform efforts to reduce dependency from imports and some progress in diversifying the energy mix, energy security remains critical: the country imports more than 93% of its energy, which represents approximately 8% of GDP. The growing domestic demand, which increases at a yearly rate of 3%, the fact that further adds to the pressure to envision strategies towards a more sustainable energy sector. These strategies will need to include investment in renewable energy, the reduction of energy consumption via increasing energy efficiency, and also synergic agreements with other countries.

Historically, the repeated sabotage of the Arab Gas Pipeline which supplies Egyptian natural gas to Jordan since 2011, and resulting disruption in gas supplies, has significant macroeconomic implications. Prior to this, Jordan was relying on the Egyptian gas for electricity generation, with 80% of gas imported from Egypt. When the interruptions happened, the government had to switch to heavy fuel oil and diesel for electricity generation, at a cost four times that of natural gas (this cost the country 3.5 million JD a day, and 555 million JD was paid as a subsidy for oil products in 2011). Despite the favorable conditions for solar and wind, Jordan's energy mix is still dominated by imported fossil fuels and natural gas. As such, the country's energy security is vulnerable to international and regional developments, as well as to fluctuations in energy prices. Redefining strategies towards a more sustainable energy sector is at the top of the political agenda in Jordan and the authorities have been envisioning alternative options, but progress has been moderate so far.

The generation capacity of thermal power plants as of the end of September 2019 reached (4,257 MW) and while the generation capacity of renewable energy projects (solar and wind) reached (1,130 MW). Comparatively the maximum peak load for the first half of 2019 was around 3,000 MW. This volume of available generating capacity is large compared to the maximum peak load and even, considering the capacity of conventional generation stations only, exceeds it by 30%. This is in contrast to the internationally recognized practices in this industry, which has limits of 10% -15%, especially in electrical systems that are connected to electric networks similar to the Jordanian network. Again, this causes significant costs for the electrical system since there is a commitment to pay for the cost of capacity for the power stations, even if their operation is suspended, according to the Energy Purchase Agreement which is based on the principle of 'take or pay'. Continuous operation of the power stations is not needed as a result of declining growth rates in electricity demand. A high growth rate for the peak load of 6.2% annually was adopted in the electrical system expansion planning, however, the actual growth rate during the three years of (2017-2019) ranged between (0% - 2%). This was a result of consumers'

¹² ACT Alliance (2018), Enhanced Climate Action in Response to 1.5°C of Global Warming. Scaling Up Nationally Determined Contributions, https://www.preventionweb.net/files/62199_actalliancereport1.5c.pdf

tendency to increase the use of energy-saving technologies, and to expand dependence on self-generation through small and large renewable energy projects, as well as economic growth decline as a result of political conditions in the region. Jordan's energy strategy should be updated and revised every three to five years¹³. Strategy updates are especially useful in under-developed countries such as Jordan, because the impacts of internal and external influences are much greater than in developed countries. Issues of short-sighted politics, dependency, and impediments to research & technology transfer all contribute to energy planning instability. However, the impact of these factors on the energy strategy would be much less dramatic if Jordan would step towards energy independence. This could be done through long term planning, through accessing local oil shale and gas & renewable energies, as opposed to importing Egyptian & Israeli gas and heavy crude oil from Saudi Arabia and Iraq.

Water challenges: Jordan is ranked as the second poorest country in the world in water sources, with less than 100 m³/capita/year of renewable water resources. For most of its surface waters, Jordan is dependent on the transboundary Yarmouk and Jordan Rivers, whose waters both Syria and Israel have overused to the detriment of Jordan. Syria has carried out unilateral water projects in the Upper Yarmouk basin, and Israel has carried out projects in the Upper Jordan River and the Golan. Their actions have violated long-standing agreements, and left Jordan with under 10% of the total flow of the freshwater resources of the Upper Yarmouk and Jordan Rivers. This could cause further destabilisation and conflict in the region. Additionally, the effects of climate change and climate vulnerability will complicate the management of shared resources of water¹⁴. Jordan also faces challenges surrounding the fiscal sustainability of the water sector, and these challenges are likely to be compounded by the COVID-19 pandemic. The recently completed public expenditure review¹⁵ suggests that, before the COVID pandemic, the water sector deficit was JD 310 million (1 percent of GDP) and the accumulated sector debt JD 2,334 million. The total debt from both loans and PPPs is JD 4,086 million (13 percent of GDP). The 2019 national budget estimated that the cost of subsidizing the water agency running costs and charges to the PPPs at JD 229 million and the cost of repaying debt falling due at JD 297 million. Coping with the additional costs associated with COVID, reducing the unsustainable withdrawals of water and substituting them with desalinated water will put considerable additional financial burden on the water sector, with the annual deficit expected to rise to JD 655 million (2 percent of GDP) by 2026. Exploring ways to enhance efficiency in water provision will be key for financial sustainability and building climate resilience.

Gender equality: Women's economic participation in Jordan is one of the lowest globally; Jordan was ranked 131 out of 156 on the 2021 gender gap index, and 133 out of 156 on economic participation and opportunities. In the MENA region, women generate only 18% of GDP, suggesting greater inclusion is a major economic growth opportunity¹⁶. The government of Jordan has set an ambitious target of increasing the female labour force participation to 24% over the next five years and has developed a Women's Economic Empowerment Action Plan¹⁷, closely linked to the development of the National Women Strategy (2020-2025), to identify the broad focus of required actions. However, the unemployment rate in Jordan has reached (23.9%) during the third quarter of 2020; 33.6% for females compared to 21.2% for males. The male unemployed percentage of bachelor-degree holders and higher was 25.2% compared to 77.0% for females, showing there is a very large talent pool of educated females looking for jobs.

From a climate perspective, studies have found that in some cases adaptation actions have led to increased workload and reduced decision-making power for women¹⁸. On the other hand, climate change adaptation and clean energy present an opportunity for increasing women's participation in the labour market, with clean energy and climate change adaptation interventions potentially providing

¹³ <https://library.fes.de/pdf-files/bueros/amman/11188.pdf>

¹⁴ Combaz, E. (2019). Jordan's environmental policies and engagement on climate change. K4D Helpdesk Report. Brighton, UK: Institute of Development Studies. https://assets.publishing.service.gov.uk/media/5d30a131ed915d2ff003b781/619_Jordan_Environment_Policies_and_Engagement.pdf

¹⁵ Information on the recent public expenditure review was provided by local partners

¹⁶ Jordan Energy Strategy

¹⁷ World Bank Group (2019) 'Women's Economic Empowerment Action Plan'

<http://pubdocs.worldbank.org/en/379131574445136942/pdf/Jordan-WEEAP-Jan-19-2019-en.pdf>

¹⁸ Sovacool, B.K. & Linner, B.O. (2016). The political economy of climate change adaptation. New York: Palgrave Macmillan.

a significant opportunity for employment of females particularly when investing in the governorates as an analysis revealed that women choice of employment is highly influenced by having a job in the same area of residency¹⁹. Enhancing women's economic participation through investing in clean energy job creation and preparedness of women and girls to enter these work fields, will help support the national vision of increasing women's economic participation to 24%. Gender mainstreaming has become an increasingly important consideration in Jordan's planning processes, and the LTS therefore presents an opportunity to address gender inequalities. By acknowledging gender differences in the process, efforts can be made to empower women as agents of change and overcome traditional barriers to women's participation in decision making²⁰.

COVID-19 challenges: Jordan has been struggling to minimize the health impact of the COVID-19 crisis. Soon after the outbreak, the Government of Jordan announced a first set of measures and incentives to address immediate liquidity and cost of financing concerns for various sectors/businesses, and measures to protect vulnerable households. Nevertheless, domestic lockdowns, the global economic slowdown, trade disruptions, and the suspension of international travel had a sizable impact on the Jordanian economy. The unprecedented economic shock of COVID-19 has exacerbated existing structural weaknesses in the economy and unresolved social challenges and put pressure on country's fragile macroeconomic stance. Key challenges to Jordan's outlook include the prolonged decline in economic activity from domestic lockdowns, which could escalate high unemployment levels. The speed of economic recovery in the medium-term largely depends on the evolution of the pandemic and whether reforms are put into effect.

Jordan's early response and implementation of several laws and containment policies can be justified given the many challenges facing the country even before the epidemic. Yet the current measures must be understood as merely short-term mitigation measures. The country will soon need to rethink its longer-term situation in the wake of the pandemic. For a country with such social, economic, and environmental stresses, the coronavirus could serve as a wake-up call, triggering the switch from its existing crisis adjustment policy to a robust crisis management and alleviation policy. Such changes can only be implemented through political will—and the risks either way are unavoidably substantial. The COVID-19 crisis and recovery has the potential to be an opportunity for planners and policy makers to take transformative actions towards creating a country that is more just, resilient, and sustainable.

2.2 Jordan's climate change activities



Jordan was the first Non-Annex I country to produce an Initial National Communication (INC) and has been an active member in almost all Climate Change and other UN Conventions' global treaties, partnerships and programmes. As climate change is set to worsen an already difficult environmental, political, economic, and social situation in Jordan, the country has adopted a large number of general and sector-specific climate policies, and actively engaged diverse actors on these issues at domestic, regional, and international levels. It has implemented many measures to adapt to climate change, especially regarding water and energy. However, while it has achieved some successes, important gaps and shortcomings in policy and action remain, due to a mix of legislative, regulatory, institutional, political, and economic factors.

Beside Jordan's overarching 2025 National Vision and Strategy and National Green Growth Plan, the country's major policy on climate change is the National Climate Change Policy and Sector Strategic Guidance Framework, which has now been extended to 2030.

The National Climate Change Policy (2013-2020)²¹ states that the national priorities are adaptation to climate change and mitigation of greenhouse emissions, with emphasis on adaptation as the imperative track. This focus is set to remain, with mitigation being framed as complementary to, or a by-product of, adaptation activities. Jordan also aims to achieve both socio-economic development and environmental

¹⁹ JEDCO, Women entrepreneurship in Jordan (2018), <https://www.gemconsortium.org/report/women-entrepreneurship-in-jordan-2016-2017-women-empowerment>

²⁰ World bank, 2011, Gender and climate change, three things you should know, Washington DC

²¹ Ministry of Environment (2013), "Climate Change Policy 2013-2020":

https://www.jo.undp.org/content/dam/jordan/docs/Publications/Climate%20change%20policy_JO.pdf

resilience. The priority sectors it identifies include water, agriculture, energy, land use, and desertification.

So far, Jordan's efforts on climate change, including on water and energy, have remained limited in ambition and action. Analysis suggests one reason for this is that most policy-makers do not see the issue as a priority (compared to e.g. employment), in part due to a lack of understanding of its implications and costs and of the benefits of action. Another reason is that policy-making on the issue is not unified, with fragmented plans and institutions that lack consistency, comprehensiveness, links, and common purpose²². Climate action at scale is also severely under-funded, and adaptation would require large investments, for example in more efficient infrastructure for water and energy. In addition, implementing adopted policies in specific sectors would push for major changes in people's practices, which could affect the interests or livelihoods of significant parts of the population (e.g. with higher prices on water and electricity). Similarly, population growth, combined with internal migration to cities and the large presence of refugees, has all led to competition for land use and essential goods and services, with difficult policy choices remaining. All this has led government to favour policies and actions that increase supply of scarce resources over ones that decrease demand for them.

Climate action in Jordan has also remained conditional on the availability of financing. While Jordan has committed funds for adaptation and mitigation, the current lack of finance is likely to impede implementation. Given the funding gap between Jordan's climate goals and its public finances, climate action will require a shift in national planning and budgeting (alongside international funding). Jordan needs to become able to allocate domestic resources to mitigation and adaptation. Investors in climate adaptation need planning security and guarantees for their investments, including loan guarantees²³.

In 2016, Jordan submitted its Nationally Determined Contribution (NDC) under the Paris Agreement, committing to reducing GHG emissions by 14% by 2030 compared to business-as-usual (1.5% of which is unconditional, and the other 12.5% of which is conditional on the provision of international support. Jordan's NDC is currently (March 2021) being updated and will provide a basis for updating and extending Jordan's climate policies, as well as an important foundation for the LTS to build upon particularly in terms of medium-term climate change priorities and goals. In particular, any increased ambition, updated projections and new prioritised actions should be taken into account in the mitigation element of the LTS. Additionally, Jordan's second BUR is expected to be published soon, work is about to commence on the Fourth National Communication (which will most likely be a key foundational document for the LTS), to be completed in late 2021 to early 2022, and Jordan's National Adaptation Plan (NAP) is currently in final-draft, and will be a key foundational document for the adaptation aspects of the LTS.

2.3 Role of the LTS in Jordan

Currently in the midst of the COVID-19 pandemic and undertaking updates to key national planning documents (such as the Executive Programme and Jordan 2025 mid-term review), as well as updating the country's NDC, there is much change and uncertainty with regards to the future direction of climate and development priorities in Jordan. The LTS process is coming at a challenging time, and Jordan, along with many countries, is increasingly under pressure to deliver on economic, social, health, as well as environmental challenges.



Undertaking a comprehensive and inclusive longer-term planning process in Jordan is an opportunity for the country to address multiple objectives on climate, development and economic recovery and growth.

- Setting a long-term vision and creating an overarching country strategy to achieve this, with a pathway and key milestones, will help to ensure that future short-term crisis responses and recovery policies can be aligned to a longer-term pathway.

²² Combaz, E. (2019). Jordan's environmental policies and engagement on climate change. K4D Helpdesk Report. Brighton, UK: Institute of Development Studies. https://assets.publishing.service.gov.uk/media/5d30a131ed915d2ff003b781/619_Jordan_Environment_Policies_and_Engage_mt.pdf

²³ ACT Alliance (2018), Enhanced Climate Action in Response to 1.5°C of Global Warming. Scaling Up Nationally Determined Contributions, https://www.preventionweb.net/files/62199_actalliancereport1.5c.pdf

- The LTS can ensure future updates to sectoral strategies and policies are undertaken in a harmonised way, consistent with a common agreed goal. This helps to ensure decision-making and solutions in the short term can be taken with a long-term view, to avoid lock-in to unsustainable or incompatible technologies or policy decisions.
- An inclusive LTS development process can provide the opportunity for new voices to be heard and citizens to shape their country, particularly in light of the current recovery needs.
- If the LTS process can be aligned with parallel recovery and activities for a “green and sustainable recovery”, for example ensuring that bounce-back from COVID-19 is still aligned with the long-term pathway, there can be win-wins. This will also help to ensure that climate change is not de-prioritised as a result of these pressures, provides some longer-term policy and investment certainty, and an international signal of decarbonisation intent to decision makers, businesses, investors and the international community.

Whilst Jordan should seek to align the LTS with ongoing climate change processes, it will not be developed in time to inform the current NDC update. However, using the five-year revision cycles for Parties to submit their NDCs to the UNFCCC is an opportunity to improve future NDC submissions and ensure the alignment of medium-term targets (NDCs) with the LTS vision.

If Jordan ensures that the country’s long-term vision informs subsequent NDC target setting for the medium-term, and incorporate the latest developments in science, policy and technology, then the LTS can be better mainstreamed into policy and implementation planning.

2.4 LTS development



There are no established guidance or best practices on LTS development.

However, some principles for Jordan’s LTS development might be to ensure it is:

- ✓ **Country-led, developed inclusively with stakeholders, citizens and policy makers**
- ✓ **Meeting Jordanian needs and the Jordanian context**
- ✓ **Strategic and long-term, establishing a vision, principles and framing for short- and medium- term national and sectoral policies and plans, that implement the LTS**
- ✓ **Prioritising adaptation to climate change, given the vulnerability of the country**

This report includes reference to some of the early published international LTS examples. Approaches to date have been varied and provide only examples of approaches and not a ‘rulebook’ or template to follow. These published LTSs have been drawn upon only as examples, to illustrate optional approaches and contextualise experiences in practice. These examples have been combined with the limited literature and guidance available, the authors’ experiences, and research and knowledge of the Jordanian context to provide inspiration, suggestions and recommendations for how Jordan should approach its LTS elements. As such, the Table 2-1 expands on the seven common elements that various literature and other LTSs have identified, and uses country examples to describe the contents that might be included in an LTS. These elements can form the basis of an LTS.

Table 2-1: Common elements of an LTS

#	Key elements	Description and examples
1	A long-term vision	The purpose of including a long-term vision in an LTS is so that its development remains focussed and is guided by an overarching end goal that is simple, transparent and easy to communicate. A good example of this is included within Fiji’s LTS ⁶⁰ (F-LTS). It describes how the country aims to reach net zero carbon emissions by 2050 across all sectors of its economy, and how it is underpinned by similar visions contained within its national development frameworks.
2	Sustainable development considerations	Including sustainable development considerations within an LTS can serve to harmonise both near and longer-term sustainable development agendas with those of the Paris Agreement. Research has found that national level implementation of the 2030 Agenda for Sustainable Development and the

		Paris Agreement on climate change can be prone to divergence, despite the opportunities for synergies.
3	Adaptation elements	Including adaptation is considered a key element in an LTS due to the importance of a long-term plan to build resilience to the effects of climate change across the country. The degree of focus between sectors such as agriculture, health and water will vary country by country, as will the strategy's description of its long-term efforts to reduce their vulnerability to climate change impacts. To date, few countries have developed an LTS that includes substantial information on adaptation elements, however Benin's 2016-2025 strategy and Mexico's LTS (amongst others) provide examples of low to middle income countries that have. ^{24, 25}
4	Mitigation elements	Including mitigation elements is key to an LTS in order to demonstrate how the country plans to mitigate its contributions to climate change over the long-term. Typically, this includes a GHG emissions target for 2050, and a scenario that illustrates a potential pathway to achieve that target. Other scenarios may be included, for instance that vary in their conditionality or ambition.
5	Sectoral strategies	Detailing how the LTS will affect different sectors of the economy is central to providing a transparent level of detail. This can include policies and actions for each sector, the milestones to be achieved over time, or information on managing the transition to the long-term goals among others will. An example of this can be seen in Costa Rica's LTS ⁶¹ , where 10 sectoral decarbonisation "axes" are described ²⁶ .
6	Implementation approaches	At LTS is intended as a strategic and long-term document rather than an 'implementation plan'. Sectoral strategies, NDCs and other shorter-term policies should be the main mechanisms for implementation. However, the LTS could reference the mechanisms through which implementation will occur. For instance, highlighting the sectoral strategies that the LTS priorities should be integrated into, referencing how efforts to implement the LTS will be co-ordinated, or any overseas aid or investment that would be required. Some LTSs have chosen to include policies and actions in the adaptation and mitigation chapters, as well as in-country capacity building or technical support. An example of this can be seen in the Marshall Islands LTS, that details its headline recommendations in a chapter on means of implementation ²⁷ .
7	Monitoring plans and revisions processes	A LTS typically extends to the mid-century and so the importance of including how this strategy and its sectoral actions will be monitored, revised and updated is important. Whilst the LTS itself is not intended as an 'operational' document, integrating a process for monitoring updating in future, the institutional and governance arrangements, and any integration into existing national MRV systems are beneficial to include. Fiji's LTS ⁶⁰ provides an example of this in their chapter titled Governance, Monitoring and Evaluation.

²⁴ Stratégie de développement à faible intensité de carbone et résilient aux changements climatiques. Ministère du Cadre de vie et du Développement Durable, AFD, UNDP. https://unfccc.int/files/focus/long-term_strategies/application/pdf/benin_long-term_strategy.pdf

²⁵ Mexico's Climate Change Mid-Century Strategy. Mexico Ministry of Environment and Natural Resources, National Institute of Ecology and Climate Change. https://unfccc.int/files/focus/long-term_strategies/application/pdf/mexico_mcs_final_cop22nov16_red.pdf

²⁶ National Decarbonisation Plan 2018-2050. Government of Costa Rica. <https://unfccc.int/sites/default/files/resource/NationalDecarbonizationPlan.pdf>

²⁷ Tile Til Eo 2050 CLIMATE STRATEGY "Lighting the way". The Republic of the Marshall Islands.

https://unfccc.int/sites/default/files/resource/180924%20rmi%202050%20climate%20strategy%20final_0.pdf

PART A: THE CONTENT OF THE LTS

This section outlines the key content elements of the LTS, outlining the Jordanian context for each of the elements, and proposing an approach to each.

Provides recommendations on the content of the LTS (i.e. its different elements and the content of these elements). It is structured to align with key elements of a LTS:

Navigation



Section 3: National Circumstances

Provides an overview of the role of national circumstances information; international examples of the information included; recommendations for information Jordan should include and sources for this.

Summarises key information on the national context in **two parts**. Firstly, context and priorities including: National objectives, SDGs, Gender mainstreaming, COVID-19. Secondly, information on Jordan's climate change activities to date, including:

- Climate response to date
- GHG emissions context and trends, based on existing data
- Climate risks and vulnerabilities based on assessment of the science and literature

This section is supported by

- **Annex 1** that provides information on Jordan's national circumstances that may be included in the LTS
- **Annex 3** that presents the outcome of the adaptation analysis, including the vulnerability and risk assessment and synthesis of climate scenarios
- **Annex 4** that contains technical guidance on mitigation pathways and modelling approaches
- **Annex 7** that provides analysis of opportunities for gender mainstreaming

Section 4: Long-Term Vision for Jordan

Provides an overview of the importance of the long-term vision, international examples, and provides a framework for Jordan to develop its vision. It outlines the key strategies and existing visions and goals in the country and proposes a set of key themes for the vision and a draft vision statement.

This section is supported by **Annex 2**, which provides a review and assessment of Jordan's visions and strategies.

Section 5: Long-Term Adaptation and Mitigation Strategy

Includes a suggested approach to structuring the strategy in light of key mitigation and adaptation needs arising from the analysis in sections 3 and 4.

It provides a suggested framework for Jordan's climate response, based on a set of 15 integrated pillars and long-term actions, and provides a prioritisation approach and recommendations for integrating into sectoral strategies.

This section is supported by

- **Annex 3** that presents the outcome of the adaptation analysis, including the vulnerability and risk assessment and synthesis of climate scenarios
- **Annex 4** that contains technical guidance on mitigation pathways and modelling approaches

3 National circumstances

Navigation

Regarding the “National circumstances” element of the LTS, this section provides:



- **Role of the “National circumstances” section**
 - o A description of the role and importance of the ‘national circumstances’ section in the LTS.
- **International examples**
 - o Examples of “national circumstances” sections in other LTSs.
- **Framework for Jordan’s “National circumstances” section: what should it include?**
 - o A framework for how this element may be presented in Jordan’s LTS and what it might include.
- **Information to develop the “National Circumstances” sections**
 - o Core information relevant to the content of this element for Jordan. This includes a summary of
 - national development, climate and sector objectives
 - national development goals,
 - gender mainstreaming
 - COVID-19 recovery issues.
- **Information of Jordan’s climate change context**
 - o Information on Jordan’s climate change response to date, emissions context, and adaptation context.

This section is supported by

- **Annex 1** that provides information on Jordan’s national circumstances that may be included in the LTS.
- **Annex 3** that presents the outcome of the adaptation analysis, including the vulnerability and risk assessment and synthesis of climate scenarios
- **Annex 4** that contains technical guidance on mitigation pathways and modelling approaches
- **Annex 7** that provides analysis of opportunities for gender mainstreaming

3.1 Role of the “National circumstances” section



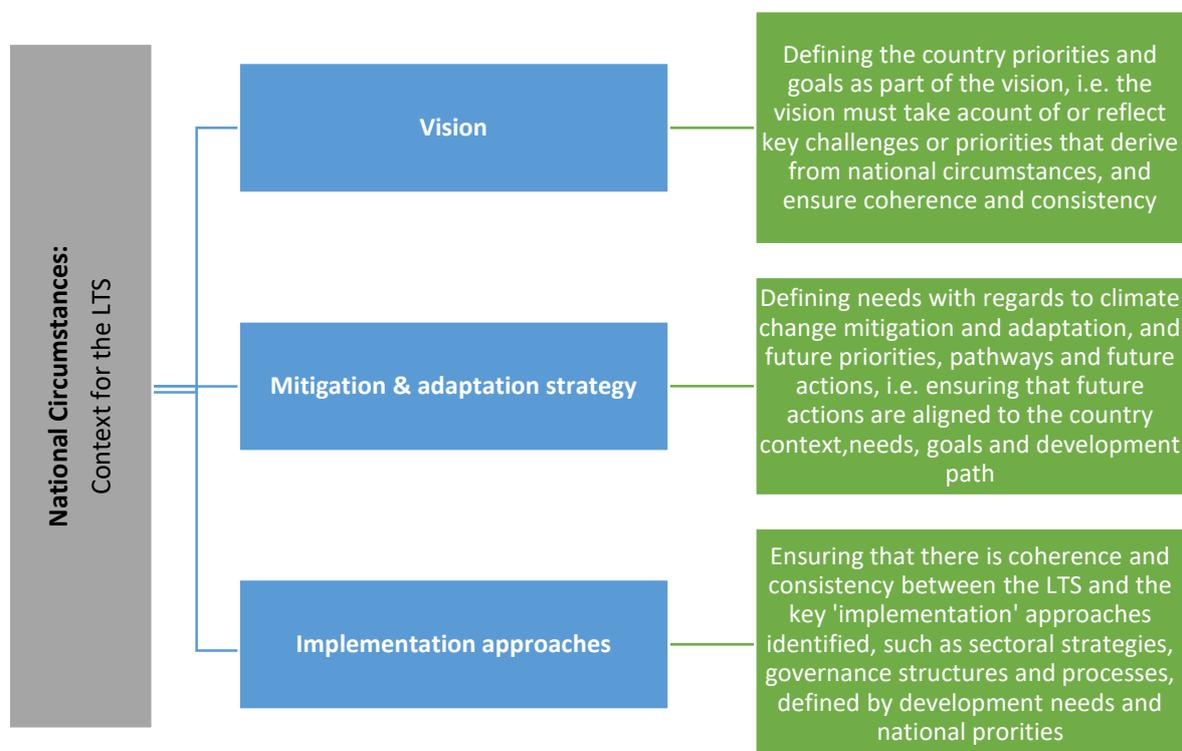
Understanding the national context and the unique circumstances of Jordan is important for framing the LTS. A country’s LTS should take into account *“their common but differentiated responsibilities and respective capabilities, in the light of different national circumstances”* and should therefore be country specific, country driven, reflect country needs and priorities and present country-specific solutions to the common challenges of low carbon and resilient development.

Setting out clearly the key contextual challenges for Jordan is therefore important for framing the content of the LTS. The national context is important not only as standalone content in the LTS document – the ‘National Circumstances’ – but should also be considered as the foundation for defining the vision, strategies and pathways and implementation approaches for example.

This section sets out this context for Jordan, providing information that can feed into and inform the development of the different components of Jordan's LTS (as shown Figure 3-1).

Annex 1 provides a summary of the key features of Jordan's National Circumstances that could be included in the LTS National Circumstances section.

Figure 3-1: National circumstances and interaction with other LTS components



Source: Developed by Ricardo Energy and Environment

3.2 International examples

In many cases, countries have compiled relevant information on national circumstances previously in documents such as National Communications (NCs). For example, the UNFCCC states that NCs shall be prepared in accordance with the guidelines contained in decision 17/CP.8²⁸ and the Annex provides specific details of what these should include (see Box 3-1).



²⁸ Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention https://unfccc.int/sites/default/files/17_cp.8.pdf

Box 3-1 Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention – Annex on information to provide on National Circumstances

Non-Annex I Parties should provide a description of their national and regional development priorities, objectives and circumstances, on the basis of which they will address climate change and its adverse impacts. This description may include information on features of their geography, climate and economy which may affect their ability to deal with mitigating and adapting to climate change, as well as information regarding their specific needs and concerns arising from the adverse effects of climate change and/or the impact of the implementation of response measures, as contained in Article 4, paragraph 8, and, as appropriate, in Article 4, paragraphs 9 and 10, of the Convention. 4. Non-Annex I Parties are encouraged to provide a summary of relevant information regarding their national circumstances, as appropriate, in tabular form. 5. Non-Annex I Parties may provide a description of existing institutional arrangements relevant to the preparation of their national communications on a continuous basis.

An LTS is intended to align with and support existing strategies, and duplication of large amounts of information reported previously is not recommended. Rather, it is recommended that the LTS focus on the pertinent issues of relevance to the country’s development over the *long term*. For example, economic and population trends, pressures and opportunities; geographic constraints and opportunities; climate hazards and risks that will be faced; current emission sources and trends; and key historical, political or socio-cultural factors or events that have or will impact development.

Other countries’ LTSs have included a variety of different elements in their National Circumstances section. These are summarised in [Table 3-1](#) below.

Table 3-1: Comparison of the 'National Circumstances' sections of a selection of submitted LTSs.²⁹

Country	National circumstances section of the LTS
Singapore	Climate Population Water supply (as a key issue/risk) Economy
Fiji	Country context (geography, population, economy) Climate change context (risks, vulnerabilities etc) Role in international climate action National development goals (e.g. achievement of SDGs) Regional context (e.g., SIDS) Legal and institutional frameworks
Republic of the Marshall Islands	Geography Economy History/politics Climate context (e.g. emissions, policies, risks, goals)
Mexico	Socioeconomic and ecological trends Climate risks and vulnerabilities Historical emissions context Legal and institutional framework
South Africa	Economy (by sector) Emissions profile Political landscape

²⁹ The long-term strategies explored here can all be accessed via: <https://unfccc.int/process/the-paris-agreement/long-term-strategies>

3.3 Framework for Jordan’s “National circumstances” section: what should it include?



Jordan’s national circumstances (country context, key development goals (detailed above), strategic priorities etc) are recommended to be included in the LTS. Based on international approaches and best practice, it is recommended that the ‘National Circumstances’ section of Jordan’s LTS details the information included in [Table 3-2](#) below.

Additionally, Jordan might like to integrate either into the sections, or summarise in a standalone item, **specific pressures and challenges facing the country and region**, both short and long term. For example, COVID-19 impacts, refugees, water scarcity and energy security, for example. Some of these challenges were set out in section 2 above. The following approach is proposed for detailing Jordan’s national circumstances in the LTS.

Table 3-2: Proposed framework for the ‘national circumstances’ section of Jordan’s LTS.

Information to include	Key messages / focus	Information source(s)
Country context (geography, history, population, economy, regional context and challenges, socioeconomic and ecological trends)	Provide a summary of the main features of the country with a particular focus on trends and challenges and how they might impact Jordan’s future development. This should aim to provide the key context for readers to understand the priorities and strategies, i.e. flagging the country’s main challenges and opportunities.	Connecting with the 4 th National Communication process to align national circumstances information would be advisable i.e. ensuring consistent data and trends are reported. Additionally, sectoral strategies can be referenced for sector-specific information. Specific sectoral objectives, goals and targets are included below.
National development goals (e.g. achievement of SDGs)	Provide context to the LTS by explaining Jordan’s existing priorities with regards to development and achievement of SDGs. This is also an opportunity to highlight LTS priorities such as gender, inclusive development / ‘leaving no one behind’, youth, vulnerable groups etc.	Vision 2025 & Executive Development Plan
Summary of climate change context (risks, trends, emissions, priorities, actions)	This should provide the context for the LTS, including current emissions and future trends, and current and expected future climate risks and vulnerabilities. In this section, existing climate commitments and objectives can also be outlined including NDC commitments.	Information can be gathered from existing documents such as the BUR2 and NC4 (forthcoming). However, in the LTS process it is likely that new data and analysis will be created which will also need to inform this section
Legal and institutional framework	It is useful to provide a brief overview of the institutional and governance structures and frameworks for the LTS including the lead ministries/departments, steering	The Climate Change Bylaw as well as information contained in this report and developed during the LTS process. Also ensure to

	<p>groups, committees etc. Reference to the Climate Change Bylaw and National Climate Change Committee can be incorporated here to demonstrate how the LTS is embedded and managed – with the added benefit of reinforcing this.</p>	<p>align with the BUR2 and NC4 (forthcoming)</p>
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3.4 Information to develop the “National Circumstances” sections



This section summarises the information that could form the basis of Jordan’s National Circumstances section, and also provides additional context for later sections. This could be adapted for use directly by the LTS development team, as well as used to inform the subsequent LTS elements.

3.4.1 Summary of national objectives and documents, by theme and sector

The table below summarises the main visions, goals and objectives of the country and the strategies these are drawn from, as a quick reference guide.

Sector	Key Goals and Objectives	Relevant Documents
Mitigation	<p>INDC target: 14% GHG reduction (1.5% unconditional / 12.5% conditional)</p> <p>Local SE-CAP targets: Greater Irbid has committed to reduce emissions by at least 40 % below 2015 levels by 2030 (conditional). Aqaba and Karak have also adopted this 40% target, but as a secondary scenario.</p> <p>Amman has committed to net zero emissions by 2050 in the ‘Amman Climate Plan’</p> <p>The National Energy Strategy 2020 – 2030 aims to reduce CO₂ emissions by 10% by 2030.</p>	<p>NDC</p> <p>Local SE-CAPs</p> <p>The Amman Climate Plan</p> <p>National Energy Sector Strategy 2030</p>
Adaptation	<p>Climate Change Policy 2013-2020:</p> <ul style="list-style-type: none"> To build the adaptive capacity of communities and institutions in Jordan, with consideration for gender and addressing the needs of vulnerable groups, to increase the resilience of natural ecosystems and water as well as agricultural resources to climate change, and to optimize mitigation opportunities <p>NAP: Key areas to be targeted in adaptation efforts:</p> <ul style="list-style-type: none"> Water Sector: Agriculture sector Urban sector Socioeconomic Ecosystems and biodiversity Health 	<p>NC3</p> <p>Climate Change Policy 2013-2020</p> <p>National Adaptation Plan</p> <p>Prioritised List of NDC Actions</p> <p>Technology Needs Assessment</p>
Energy Sector	<p>National Energy Sector Strategy:</p> <ul style="list-style-type: none"> To increase self-sufficiency through utilization of domestic natural and renewable resources, as well as expansion of existing energy developments thus reducing reliance on costly foreign fuel imports that burden its economy To improve energy efficiency in all sectors by 9% by 2030 <p>Energy Sector GG-NAP:</p> <ul style="list-style-type: none"> To decrease use of fossil fuels and decrease reliance on fossil fuel imports Enhance innovation and technical capacities in the energy sector. 	<p>National Energy Sector Strategy 2020-2030</p> <p>Energy Sector GG-NAP</p> <p>OECD clean energy</p>
Transport Sector	<p>Long-Term National Transport Strategy:</p> <ul style="list-style-type: none"> MoT vision is to have a developed and sustainable transport sector, distinguished for competency, safety and environmental stability, enhancing the socio-economic development and making Jordan a regional hub for transport <p>Transport Sector GG-NAP:</p> <ul style="list-style-type: none"> Increase access to reliable, affordable, and safe public transport services for all, including women, youth, and rural communities; 	<p>Long-term National Transport Strategy</p> <p>Transport Sector GG-NAP</p>

	<ul style="list-style-type: none"> Promote the use of electric and hybrid vehicles through strengthened regulations and incentives; Promote non-motorized transport modes and provide necessary infrastructure Reduce GHG emissions (CO₂) from the transport sector; Promote the use of climate-resilient infrastructure in transport sector investment planning Increase public funding and private investment in the transport sector 	
Agriculture Sector	<p>National Agricultural Development Plan:</p> <ul style="list-style-type: none"> To digitize and restructuring the sector, and boost its productivity Increase the forest area by 10% by 2025 and expand pasture areas Increase the number of farmers using digital government-run agricultural services by 30% Increase the productivity of food and agricultural manufacturers by 18% by 2025 <p>Agriculture Sector GG-NAP:</p> <ul style="list-style-type: none"> Improve the skills and capacity of farmers, rural communities, youth and women to undertake sustainable agriculture; Increase use of resource efficient technology to reduce consumption and cost of water, energy, and waste management on farms and in agro-processing. Increase use of high-yield, drought and salinity-resistant plant varieties; Develop and implement policy and fiscal tools that encourage the take-up of adaptive techniques and technologies Introduce the concept of climate smart agriculture on farms; Increase carbon sequestration capacity of Jordan's land and forest. 	<p>National Agricultural Development Plan 2020-2025</p> <p>Agriculture Sector GG-NAP</p>
Industrial Sector	<p>JEGP:</p> <ul style="list-style-type: none"> Expanding the industrial manufacturing base, increasing available production capacity, enhancing the competitiveness of service sectors, providing an enabling business environment and creating job opportunities for Jordanians; all through building concrete and effective partnerships with the private sector. <p>Prioritised NDC mitigation actions for the industrial sector:</p> <ul style="list-style-type: none"> Low-carbon technology R&D Incentives for Low-carbon industries Promote EE and RE 	<p>Jordan Economic Growth Plan (JEGP)</p> <p>Prioritised NDC Actions (Mitigation)</p>
Waste Sector	<p>National Municipal Solid Waste Management Strategy</p> <ul style="list-style-type: none"> Expansion of MSW recycling and separation schemes Construction of mechanical and/or biological treatment facilities, and other sophisticated material recovery systems <p>Decentralized Wastewater Management Policy</p> <ul style="list-style-type: none"> Establishing a decentralized wastewater management approach Expand wastewater management by implementing the practice of recycling and reusing water beyond the existing conventional wastewater service system <p>Water Substitution and Re-Use Policy</p> <ul style="list-style-type: none"> More efficient use of water resources through reusing treated wastewater in irrigation that enables freeing fresh water for municipal uses. <p>Waste Sector GG-NAP</p> <ul style="list-style-type: none"> Reduce greenhouse gas emissions from landfills and dumpsites, particularly methane gas resulting from decomposed organic matter. Improve the resilience of waste management and treatment infrastructure to climate-related disasters (such as floods). 	<p>National Municipal Solid Waste Management Strategy 2015-2034</p> <p>Decentralized Wastewater Management Policy 2016</p> <p>Water Substitution and Re-Use Policy 2016</p> <p>Waste Sector GG-NAP</p>

	<ul style="list-style-type: none"> Promote inclusive innovation in technology and processes to leverage waste-to-resource and waste-to-energy potential. Increase the amount of waste diverted from landfills toward recycling and re-use 	
Water Sector	<p>National Water Strategy</p> <ul style="list-style-type: none"> The long-term goal is to achieve water security in the country Proactive and preventive water adaptation approaches in protecting the limited water resources with emphasis in drinking water resources and upgrading drinking water quality management system and surveillance programs. Preparedness and response for natural disasters such as severe weather, flooding and extreme temperatures, and external and internal conflicts <p>Water Sector GG-NAP</p> <ul style="list-style-type: none"> Augmenting water supply for priority economic activities through decentralized infrastructure solutions, such as rain water harvesting (RWH) or reclaimed wastewater; Introducing demand management measures such as efficiency improvements, loss reduction, water reallocation, and incentive structures to save/conservate water; Ensuring equitable, reliable, and affordable access to clean water and sanitation services for all; Building resilience to climate-change related water challenges among vulnerable groups; Increasing water-use efficiency across all sectors including agriculture, industries, and municipal sectors; Reducing water losses and leakages in municipal water services and in conveyance systems to improve their efficiency in delivery; Increasing the quantity of water and wastewater treated for further recycling and reuse. Improve drought resilience by expanding decentralized supply and introducing demand management measures across sectors; Improve flood resilience through flood risk management measures, through appropriate flood mitigation infrastructure and measures to respond effectively to floods; Reducing GHG emissions in the water sector through use of RE and EE in water production and distribution systems. 	<p>National Water Strategy 2016-2025</p> <p>Water for Life 2008-2022</p> <p>Water Sector GG-NAP</p>
Tourism	<p>Tourism Sector GG-NAP:</p> <ul style="list-style-type: none"> Increase public awareness about the value of natural resources and the environment through tourism sector activities; Strengthen availability of data around environmental issues and mainstream the environment into the tourism sector's development planning and management; Reduce the negative impacts of the tourism sector on the natural environment (including biodiversity and at natural heritage sites); Improve the attractiveness of tourism in Jordan to investors and tourists (foreign and domestic); Increase the overall return on tourism sector investments by increasing the quantity and quality of tourism products and services, and enhance innovation in service provision Develop green job opportunities in the tourism sector for all, especially women and youth; Enhance the resilience of critical infrastructure in key tourism areas to natural hazards and climate-related risks; Increase the resilience of the tourism sector 	<p>Tourism Sector GG-NAP</p>
Economy	<p>National Green Growth Plan (NGGP):</p> <ul style="list-style-type: none"> A clear vision for Jordan as a country with an expanding and sustainable economy that creates jobs, income for its citizens, and is resilient to external shocks and instability in the region. A country of economic opportunity for everyone that provides decent work and 	<p>NGGP</p> <p>Jordan 2025</p> <p>Jordan Economic Growth Plan</p>

	<p>living conditions based on an environmentally sustainable economic growth model</p> <p>Jordan 2025: The most important goals that the vision seeks to achieve include:</p> <ul style="list-style-type: none"> • Economic growth, fiscal stability, reduction of financial waste and public debt to safe levels. • Foreign investment by enhancing and increasing business and investment competitiveness. • Development of economic sectors through market creativity and honing the tools and means of high-value-added export-oriented sectors. • Encouragement of small and medium-sized businesses. • Enhancement of the policies governing the labor market. 	Jordan Economic Monitor
Gender and Inclusivity	<p>To identify and develop gender-sensitive strategies to respond to the environmental and humanitarian crises caused by climate change</p> <p>Key SDGs: SDG5 (Gender Equality)</p> <p>Key goals from Jordan 2025:</p> <ul style="list-style-type: none"> • An increment of women's participation in the labor market. • Giving necessary attention to people with special needs. <p>Gender mainstreaming is a key objective of the Local Climate Actions Plans of Deir Alla, Busaira and Ayoun municipalities</p>	<p>Jordan 2025 SDG Review Rural Women and Climate Change in Jordan Local CAPs</p>
COVID-19 Response	<p>The primary vision for Jordan's COVID 19 response is to Build Back Better (BBB)</p>	<p>The Impact of the COVID-19 Pandemic on Enterprises in Jordan</p> <p>Jordan Food Security Update: Implications of COVID-19'</p>

3.4.2 Country context

For brevity, information for the country context is not reproduced here.

More information
in Annex 1

3.4.3 National development goals

In developing the LTS, it will be important to consider the main development goals of Jordan and the strategies or plans that exist to address these. It will also be important to ensure the LTS addresses high priority development goals.

Jordan is classified as a country of high human development and an upper-middle income country. According to a report released by the Department of Statistics in 2019, the population of Jordan has increased from about 586,000 in 1952 to 10.309 million by the end of 2018³⁰ due to forced migration. The annual cost of providing for refugees is roughly USD 2.9 billion (8% of Jordan's GDP), according to the BUR1, of which only 5.5% has been covered by the international community. The arrival of more than 200,000 Syrian workers (around 10% of Jordan's workforce), who are willing to work at below market wages, could cause downward pressure on local wages³¹. However, it is important to note that some studies suggest no negative impacts of refugees on labour market outcomes for locals, including wages³².

³⁰ Jordan Department of statistics, <http://dosweb.dos.gov.jo/publications/>

³¹ Correspondence with local partners

³² Fallah, B., Krafft, C. and Wahba, J. (2019), 'The impact of refugees on employment and wages in Jordan', *Journal of Development Economics*, vol.139, pp. 203-216. Accessed from: <https://www.sciencedirect.com/science/article/abs/pii/S0304387818310344>

The Jordanian economy is one of the smallest economies in the region. The government identified poverty and unemployment as two of the most important challenges facing the country. Jordan is one of the Arab countries with the lowest employment rates for both men and women, among those above the age of 15; the percentage of unemployment is 23.9 in Q3/2020. Of those economically active, the percentage of males was 56.4% of the total labour force in Jordan, compared with 15.4% for females. The employment rate for women rises with their educational level. Only 15.3% of women with less than secondary education were employed in 2018. The World Economic Forum’s 2020 Global Gender Gap Report³³ found that Jordan ranks 138th out of 153 countries for gender equality, with only 15.1% of women actively participating in the workforce compared to 67.4% of men.

A future resilient and prosperous Jordan will require sustained peace and security and safeguarding of development gains. Jordan will also need to address the increased pressures on resources, infrastructure and services across the country, and systematically work to reduce all forms of inequality, including geographic and gender-based disparities, while empowering women and youth. For a resource-poor country like Jordan prosperity can only be achieved by continuing to invest in human resources, beginning with quality education in line with labour market needs, and ensuring the inclusive and sustainable engagement of all, particularly the untapped resources of women who invest in education but this is not reflected in the job market.

The LTS process must ensure it addresses and supports existing and new strategies to deliver on the SDGs and improve equality. Addressing for example, gender equality and economic participation issues is fundamental to achieving the vision set out in Jordan 2025, the basic principles of which include promoting the rule of law and equal opportunities, increasing participatory policy making, achieving fiscal sustainability and strengthening institutions.

The government of Jordan has set an ambitious target of increasing the female labour force participation to 24% over the next five years. The National Strategy for women 2020-2025 and the inclusion of this strategy within the Government Indicative executive plan (GIEP) is promising and shows a commitment to gender mainstreaming and women’s empowerment, additionally, the Mashreq Gender Facility Jordan Country Work Plan and activities referenced in this LTS also shows progress towards enhancing women’s economic participation. More information on gender is found below in section 3.4.4 and **Annex 7**.

Two important references for the national development goals are Jordan 2025, and the First Voluntary National SDG Review – outlined in **Table 3-3** below.

Table 3-3: A summary of Jordan's main development goals (and the documents/strategies they are detailed in), and the importance of these development goals to the LTS.

Document /Strategy	Main development goals detailed	Importance to LTS
Jordan 2025 ³⁴	<p>Boost economic growth, achieve fiscal stability, reduce financial waste, delivery support to those who deserve it and reduce public debt to safe levels.</p> <p>Enhance the business and investment environment and raise the competitiveness to attract local and foreign investment, enhance partnership between public and private sectors and revisit the role of the private sector in terms of size and contribution to development priorities.</p> <p>Development of economic sectors through market creativity and honing the tools and means of high-value-added export-oriented sectors.</p>	<p>Jordan 2025 (also sometimes referred to as ‘Vision 2025’) is the most important document to consider in the development of the Jordan LTS. It is considered the 10-year (2015-2025) blueprint for economic and social development that the government has been following since 2015, and forms the basis of numerous other strategies (e.g. NGGP).</p>

³³ World Economic Forum (2019), “Global Gender Gap Report 2020”: http://www3.weforum.org/docs/WEF_GGGR_2020.pdf

³⁴ Government of Jordan (2014), “Jordan 2025”: <http://inform.gov.jo/en-us/By-Date/Report-Details/ArticleId/247/Jordan-2025>

	<p>Encouragement of small and medium-sized businesses, increasing financial support for these enterprises, providing them with suitable environment to prosper as engines as economic growth and promoting their role as employers of young people, by encouraging the spirit of entrepreneurship and innovation.</p> <p>Enhancement of the policies governing the labour market, focused on building a labour force through vocational training, especially youth and women.</p> <p>Increase women's participation in the labour market through specific programs.</p> <p>Giving necessary attention to people with special needs and work to fully integrate them into society.</p>	
<p>First Voluntary National SDG Review³⁵</p>	<p>SDG1 (No Poverty)</p> <p>SDG2 (No Hunger)</p> <p>SDG3 (Good Health and Well-being)</p> <p>SDG4 (Education)</p> <p>SDG5 (Gender Equality)</p> <p>SDG6 (Water)</p> <p>SDG7 (Energy)</p> <p>SDG8 (Prosperity and Decent Work)</p> <p>SDG9 (Industry, Innovation and Infrastructure)</p> <p>SDG13 (Environment and Climate Change)</p> <p>SDG16 (Justice, human rights, and participation)</p>	<p>Key theme of the LTS is going to be “gender mainstreaming” – links to SDG5.</p> <p>Citizen engagement to be key in development of the LTS – links to participation aspect of SDG16.</p> <p>LTS itself is highly relevant to SDG13.</p> <p>Alignment of LTS with other key policy areas can aid achievement of most, if not all, SDGs.</p>

**More information
in Annex 7**

³⁵ MoPIC (2017), “First National Voluntary Review on the Implementation of the 2030 Agenda”: <https://sustainabledevelopment.un.org/content/documents/16289Jordan.pdf>

3.4.4 Gender mainstreaming

As noted in section 2.1, women's economic participation in Jordan is one of the lowest globally. A 2015 McKinsey study found that women generate only 37% of the global Gross Domestic Product (GDP), but that closing this gap could add between USD 12 and 28 trillion to the global economy. In the MENA region, women generate only 18% of GDP, suggesting greater inclusion is a major economic growth opportunity³⁶. From a climate perspective, studies have found that in some cases adaptation actions have led to increased workload and reduced decision-making power for women³⁷. Consideration of gender issues therefore provides a critical basis for understanding differential vulnerability to climate change and addressing the underlying causes.

Jordan is a signatory to and member of several key international agreements that already commit the country to use a comprehensive gender tag approach that addresses existing inequalities. Jordan was the first Arab country to include gender mainstreaming as one of the adaptation

priorities in the third National Communication on climate change, submitted to the UNFCCC back in 2010. This acknowledged women's effective role and the benefits of women's empowerment to provide a vital role in addressing climate resilience. Under the UNFCCC, increased attention is paid to securing a gender perspective in international policies and initiatives. Gender equality is also at the centre of the SDGs, as both a stand-alone goal and a cross-cutting issue across a number of other goals to be reached by 2030 (United Nations, 2015). These commitments represent a strong statement by the global community that gender equality is a priority.

Gender mainstreaming was a priority element of Jordan's First Voluntary National SDGs Review, and the document concluded that Jordan should continue to mainstream gender throughout all national development plans in line with the SDGs, mapping gender indicator gaps and the establishment of a gender database. Further specific documents and strategies that Jordan can build on for greater gender mainstreaming include the report 'Rural Women and Climate Change in Jordan, which specifically aims to identify and develop gender-sensitive strategies to respond to the environmental and humanitarian crises caused by climate change. Jordan 2025 has culture and youth as key focus areas, and emphasises that addressing gender equality and economic participation issues is fundamental to achieving the vision, the basic principles of which include promoting the rule of law and equal opportunities, increasing participatory policy making, achieving fiscal sustainability and strengthening institutions.

In June 2010, Jordan was the first Arab country to develop a gender and climate change strategy³⁸. Following the development of the ccGAP³⁹, the Jordanian National Commission for Women (JNCW)⁴⁰

- ✓ Jordan was the first Arab country to develop a gender and climate change strategy
- ✓ Vision to increase women's economic participation to 24%
- ✓ First Arab country to include gender mainstreaming as one of the adaptation priorities in the third National Communication on climate change
- ✓ Jordanian National Commission for Women active since 2010
- ✗ Women's economic participation is one of the lowest globally: 131 out of 156 on the 2021 gender gap index, and 145133 out of 156 on economic participation and opportunities
- ✗ Q3 2020 unemployment rate was 33.6% for females compared to 21.2% for males
- ✗ Male unemployed with a bachelors degree or higher was 25.2% compared to 77.0% for females

³⁶ Jordan Energy Strategy

³⁷ Sovacool, B.K. & Linner, B.O. (2016). The political economy of climate change adaptation. New York: Palgrave Macmillan.

³⁸ UN Women (2010) Rural women and climate change in Jordan', <https://data2.unhcr.org/en/documents/download/66494>

³⁹ IUCN (2010). Programme for Mainstreaming Gender in Climate Change Efforts in Jordan. IUCN, the Hashemite Kingdom of Jordan, the GGCA. <http://genderandenvironment.org/jordan-ccgap/>

⁴⁰ The Council of Ministers, in its session held on (2/11/2010), decided to approve the reconstitution of the Jordanian National Committee for Women's Affairs headed by Her Royal Highness Princess Basma Bint Talal Al-Mazzamah and a membership of (19) persons representing the relevant ministries, councils, national institutions and civil society organizations, and prominent personalities. <https://women.jo/en>

continued to include environment and climate change in the National Women's Strategy including the recent strategy 2020-2025.

Lastly, local climate actions plans (Deir Alla, Busaira and Ayoun municipalities) integrate aspects of mitigation, adaptation and gender mainstreaming to strategically respond to local climate change impacts. In particular, they use a framework to strengthen the work of municipalities and partners in the development of climate change-related interventions, programs and activities, which take into account the needs of all members of society: males and females, young people, children and adults, people with disabilities, the poor, and the marginalized. The framework consists of activities that were incorporated in Actions where possible, to enhance the outcomes and improve local resilience. These activities were the result of a Gender Mainstreaming Exercise and Assessment during the Baseline Analysis phase of the local climate action plan development, and applied to sections including 'Identification of Actions', the 'Implementation of the Action' and the 'Evaluation of Actions'.

The above examples demonstrate both the importance of including gender (and youth, marginalised and vulnerable groups) considerations, and the opportunities to enhance equality through the LTS, and also as important context within the national circumstances.

3.4.5 COVID-19 recovery

The COVID-19 pandemic has further exacerbated existing challenges Jordan faces and placed unprecedented pressure on the economy and society. Jobs and losses in productivity with impacts on poverty, industries, food security as well as the direct health impacts, have had catastrophic effects on the country, and particularly the national debt and ability to provide key services. At present, there is "no time for long term future planning" only responding to current needs (for example, the budget of the new government has not been approved nor the EDP is published).

Impacts have been wide and varied and have impacted all aspects of the country, economy and society and exacerbated existing challenges. For example, impacts on agricultural output has brought about additional pressures to food security. Impacts include⁴¹:

- National GDP is estimated to have fallen by 23 percent during the lockdown period. The services sector was hardest hit, seeing an estimated drop in output of almost 30 percent.
- Food systems in Jordan are estimated to have experienced a reduction in output by almost 40 percent.
- Employment losses during the lockdown were estimated at over 20 percent, mainly driven by job losses in services, followed by agriculture.
- Household income fell on average by around one-fifth due to the lockdown, mainly driven by contraction in service sector activities, by slowdown in manufacturing activity, and by lower remittances from abroad.
- GDP growth rates for Jordan's economy will continue to be negative through 2020, ranging from -5.7 to -7.4 percent, depending on the speed of economic recovery. A slow pace of recovery is expected.

Food insecurity is also impacting Jordan's refugee community. August 2020 data shows that 21 percent of refugee households in host communities are food insecure (over 131,000 individuals). Another 67 percent of refugee households are vulnerable to food insecurity (equivalent to approximately 417,000 individuals)⁴².

Jordan will need to put in place recovery plans to deal with the aftermath – including the human, societal and economic costs. The Covid-19 pandemic has also been widely acknowledged as an opportunity to initiate a shift, and '**Build Back Better**' (BBB) in ways that are more sustainable, resilient and lower carbon. This needs to start immediately for Jordan, and strategies for this must emphasise the environmental as well as the social and economic dimensions. The government, development partners, private sector, NGOs and social enterprises need to come together to find solutions for the implications

⁴¹ IFPRI (2020) PROJECT PAPER Impact of COVID-19 on the Jordanian economy: Economic sectors, food systems, and households <https://doi.org/10.2499/p15738coll2.134132>

⁴² Jordan Food Security Update - Implications of COVID-19 (July-August 2020) <https://reliefweb.int/report/jordan/jordan-food-security-update-implications-covid-19-july-august-2020>

of COVID-19. BBB measures on high priority as COVID-19 unfolds in Jordan include trade diversification, digitization, and enabling social enterprises, which can create innovative approaches to value chain efficiency and inclusion⁴³.

Although the LTS is focussed on the long term and COVID-19 recovery is a short term priority, there may be opportunities to align the two. In particular, the LTS vision process and long-term climate ambition could inform the BBB strategy through helping to identify 'green' technologies, projects and investments for example, that not only shift the long term pathway but deliver short term recovery objectives. The MoE and LTS development team should therefore work closely with those leading COVID-19 recovery efforts, and the MoE should also seek to inform and input to these at the earliest opportunity to ensure recovery plans are not supporting unsustainable actions and lock-in to pathways that are not compatible with lower carbon emissions and greater climate resilience.

3.5 Information on Jordan's climate change context



3.5.1 Jordan's climate change response

Jordan signed the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, ratified it in 1993 and acceded to the Kyoto Protocol as non-Annex-I country in 2003. It signed the Paris Agreement on climate change in April 2016 and ratified the agreement in November 2016 with entry into force in December 2016.

Jordan was the first Non-Annex I country to produce an Initial National Communication (INC) and has been an active member in almost all Climate Change and other UN Conventions' global treaties, partnerships and programmes. Jordan has prepared the following climate strategies, communications to the UNFCCC, and action plans:

In 2016, Jordan submitted its Nationally Determined Contribution (NDC) under the Paris Agreement, committing to reducing GHG emissions by 14% by 2030 compared to business-as-usual (1.5% of which is unconditional, and the other 12.5% of which is conditional on the provision of international support.

Numerous other documents, reports and strategies have been produced that cover both adaptation and mitigation at a national level and at a more local level. These documents are summarised in [Table 3-4](#) below. Of importance to note for the LTS development is:

- Jordan's second BUR is expected to be published in mid-2021.
- Jordan's updated NDC is expected to be submitted July 2021.
- Work due to commence soon on the Fourth National Communication (which will most likely be a key foundational document for the LTS), to be provisionally completed by April 2022.
- Jordan's National Adaptation Plan (NAP) is now published and will be a key foundational document for the adaptation portion of the LTS⁴⁴.

While many countries have integrated adaptation into their LTS, many others have used their NAP as a reference document that is linked to their LTS. Whichever approach is chosen, the NAP will act as the most recent and most comprehensive adaptation document to inform Jordan's long-term adaptation strategy.

Jordan's updated NDC is currently (June 2021) being finalised and will provide a basis for updating and extending Jordan's climate action planning, as well as an important foundation for the LTS to build upon particularly in terms of medium-term climate change priorities and goals. In particular, any increased ambition, updated projections and new prioritised actions should be taken into account in the mitigation element of the LTS.

The Second BUR has been recently developed but is not yet published (as of March 2021). This includes the national GHG inventory for the year 2016 and an update to the measures included in the

⁴³ World Bank *et al.* (2020), "Jordan Food Security Update: Implications of COVID-19": https://docs.wfp.org/api/documents/WFP-0000122056/download/?_ga=2.127815437.1606268654.1611058242-1458411177.1611058242

⁴⁴ At the time of writing the final version was not published and so the draft version was used for this roadmap.

BUR1. The development of the Fourth National Communication Report (NC4) is due to start in the first quarter of 2021, which will include the national GHG inventory for the year 2017. In addition, the baseline scenario and mitigation scenario will be updated for the period (2016-2066). The vulnerability assessment and projections will be updated.

Table 3-4: A summary of Jordan's climate change work to date.

Document / Strategy	Date published	Spatial scale	Adaptation?	Mitigation?
Fourth National Communication	Not yet started	National	✓	✓
Updated Nationally Determined Contribution	Not yet published	National	✓	✓
Second Biennial Update Report	Not yet published	National	✓	✓
National Adaptation Plan	Not yet published	National	✓	
Amman Green City Action Plan	Consultation	Amman	✓	✓
Renewables Readiness Assessment	February 2021	National		✓
Review of opportunities & challenges for Jordanian Engagement in Cooperative Approaches under the Paris Agreement and Other Emerging Market-Based Instruments	August 2020	National		✓
Green Growth National Action Plans	July 2020	National	✓	✓
Local Climate Action Plans / Green City Action Plans	2019-2020	Deir Alla, Ayoun and Busaira municipalities	✓	✓
The Amman Climate Action Plan	2019	Amman		✓
Rural Women and Climate Change in Jordan	2018	National	✓	
Amman Resilience Strategy	2017	Amman	✓	
National Green Growth Plan	May 2017	National	✓	✓
First Biennial Update Report	2017	National	✓	✓
Nationally Determined Contribution	2016	National	✓	✓
Third National Communication	2014	National	✓	✓
Climate Change Policy 2013-2020	2013	National	✓	✓
Local Sustainable Energy and Climate Action Plans	NA	Aqaba, Karak, and Greater Irbid	✓	✓

3.5.2 Emissions context

3.5.2.1 Jordan's historical and recent emissions inventories

The last GHG inventory was undertaken during 2020 for the BUR2, for the year 2016, and will be submitted to the UNFCCC Secretariat soon. To date, GHG inventories have been calculated for the years: 2000, 2006, 2010, 2012 and 2016. The sectoral (bottom-up) approach estimated the GHG emissions and removals from all sectors, and shows the dominance of the Energy sector, representing 76% of total national emissions. National emissions have grown 109% between 2000 and 2016, with a 69% increase in Energy sector emissions. Although the waste sector only represents 12% of total emissions in 2016, it has grown 369% since 2000.

The largest single emissions sector is now power generation, contributing 38% of total Energy sector emissions, closely followed by Transport at 37%. Buildings (residential, commercial) and agriculture make up 12% of energy emissions, with industry responsible for 8% (Table 3-7).

Recent data from the BUR2 (unpublished) is shown in the figures and tables below.

Table 3-5: Jordan's GHG emissions (2016) - unpublished

2016		
Sector	% of total emissions	Emissions (Gg CO ₂ eq)
Energy	76.0%	23649.47
IPPU	10%	3177.42
AFOLU	1.38%	428.71
Waste	12%	3807.73
Total	100%	31063.32

Jordan 2016 GHG emissions profile BUR2 (unpublished)

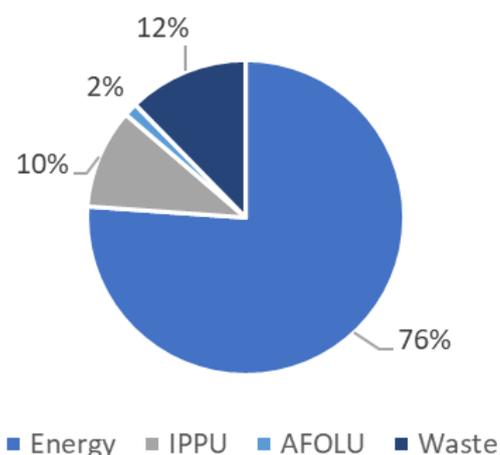


Figure 3-2: Jordan's GHG emissions (2016) - unpublished

Table 3-6: BUR2 timeseries emissions data (unpublished)

Categories/Years	2000	2006	2010	2012	2016
	Gg CO ₂ eq				
Total National Emissions and Removals	14,827.61	19,779.8	23,170.94	28,110.71	31,063.32
1 - Energy	14,016.09	18,508.44	19,260.38*	22,823.63*	23,649.47
2 - Industrial Processes and Product Use	NE**	NE**	1,776.09*	3,144.71*	3,177.42
3 - Agriculture, Forestry, and Other Land Use	NE**	NE**	180.5	237.29	428.71
4 - Waste	811.52	1,271.36	1,567.49	1,635.14	3,807.73
Memo Items (5)					
International Bunkers	523.53	905.40	1,078.11	1,110.02	4,320.36
1.A.3.a.i - International Aviation (International Bunkers)	519.04	734.85	1,016.41	1,044.24	3,394.73

1.A.3.d.i - International water-borne navigation (International bunkers)	4.49	162.49	52.2602	56.0552	925.63
1.A.5.c - Multilateral Operations	NO	NO	NO	NO	NO

* These categories have been recalculated

** These categories were not estimated (they will be estimated as part of the third BUR)

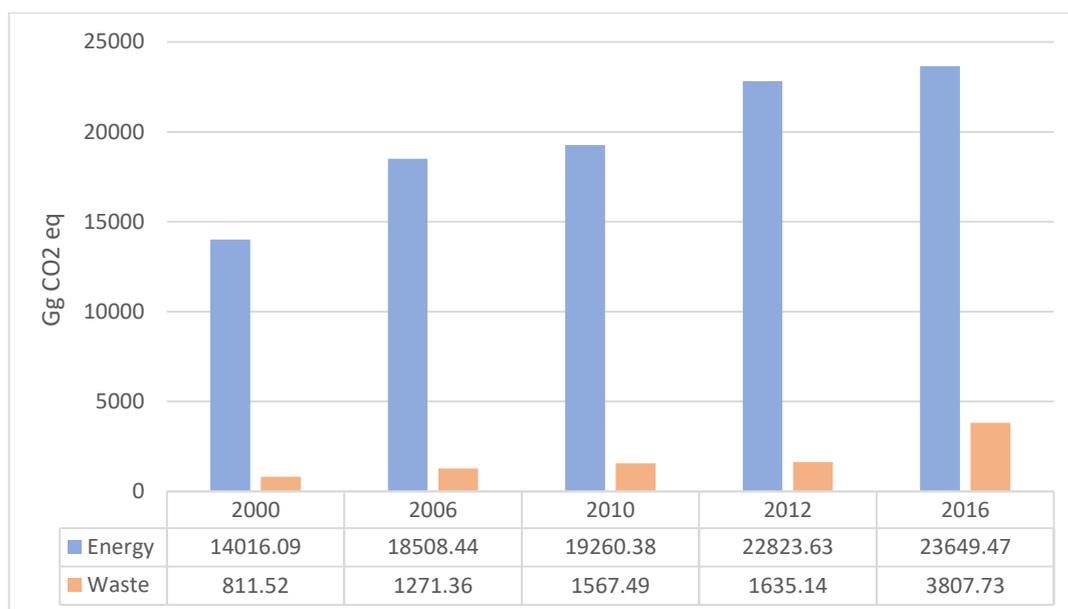


Figure 3-3: BUR2 timeseries emissions data for Energy and Waste sectors

Source: Developed by Ricardo Energy and Environment

The above figure illustrates a comparison between the energy and waste sectors for the years of 2000, 2006, 2010, 2012, and 2016. There is a normal trend of increase through the various years that could be attributed to population increase and economic growth.

According to the Second BUR, the energy sector is still the major emitter sector with the following breakdown, shown in Table 3-7 (not yet formally published).

Table 3-7: Energy sector emissions (2016) - unpublished

Sector	2016	
	Total emissions (Gg CO ₂ eq)	% of total
ENERGY SECTOR	23054.59	100%
1A Fuel Combustion Activities	23032.67	98.0%
1A1 Energy Industries sub-sector	8956.12	38%
1A2 Manufacturing Industries and Construction sub-sector	2432.06	8%
1A3 Transport sub-sector	8609.48	37%
1A4 Other Sectors (Residential, Commercial, and Agriculture) sub-sector	2354.95	12%
1A5 Non-Specified (Fuels used by the military) sub-sector	680.06	3%

1B Fugitive emissions (Oil and Natural Gas)	21.92	2%
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3.5.2.2 Jordan's existing emissions projections

The most recent published emission projections for Jordan are still those from the BUR1 (2017), shown in Table 3-8. At present, this serves as an indicator of likely future emissions, but there will be many changes when the projections are updated as part of the NC4 during 2021-22 (in particular due to the new energy strategy for the period 2020- 2030. See **Annex 2** for more details). In contrast, the NC3 projections (the basis of the NDC) show both a considerably higher baseline and mitigation scenario. Figure 3-4 below summarises the main features of the two sets of projections and their usage. This demonstrates the level of uncertainty in future medium-term projections.

See Annex 4 for more information on modelling and Annex 2 for background on previous emissions analysis

Table 3-8: BUR1 emissions projections (2017)

Year	Baseline Scenario	Mitigation Scenario	Avoided	Cumulative Reduction
	MtCO₂ Equivalent			
2020	34.33	31.65	2.68	4.95
2025	31.45	27.44	4.01	7.85
2030	38.18	33.64	4.53	9.46
2035	40.99	38.07	2.92	5.96
2040	45.56	40.73	4.83	9.32

Table 3-9: NC3 emissions projections (2014)

Year	Baseline Scenario	Mitigation Scenario	Avoided	Reduction %
	MtCO₂ Equivalent			
2020	38.15	34.61	3.54	9.3
2025	39.34	34.51	4.84	12.3
2030	51.03	46.01	5.02	9.8
2035	57.08	52.11	4.98	8.7
2040	61.57	56.39	5.16	8.4

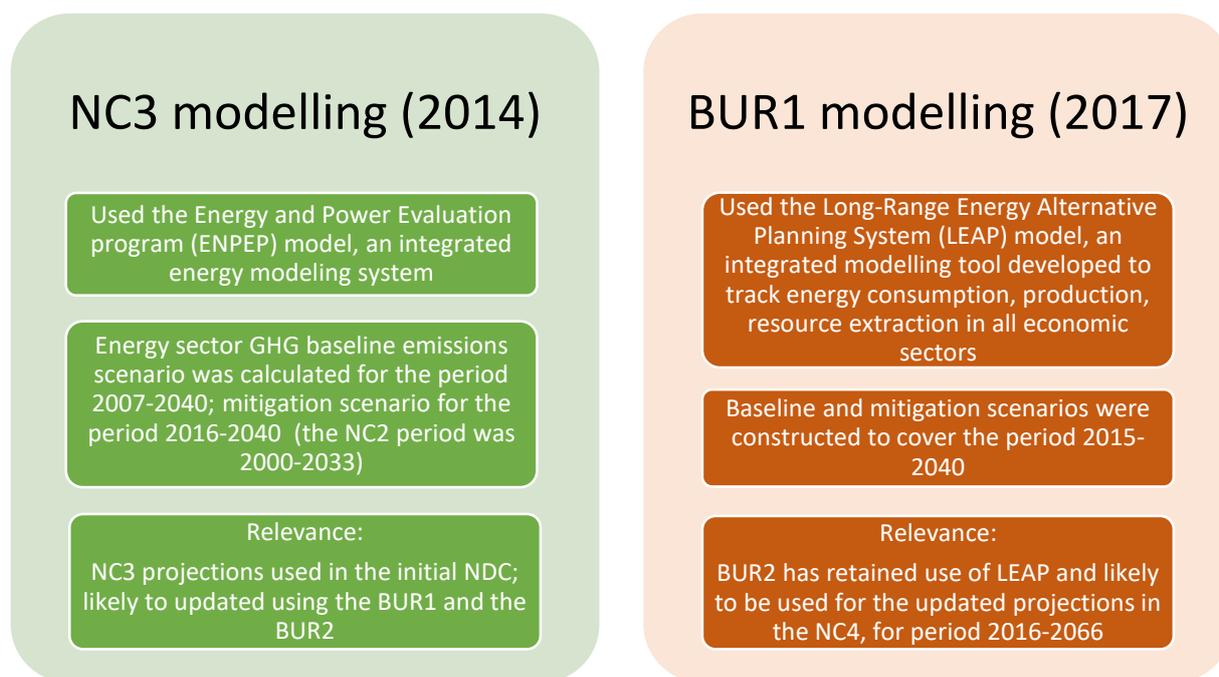


Figure 3-4: Summary of modelling utilised in Jordan

Source: Developed by Ricardo Energy and Environment

3.5.2.3 Mitigation targets and priorities

Currently, the NDC is the only national document that specifies a mitigation target for a specific timeline: 14% relative to the BAU by 2030 (1.5% unconditional / 12.5% conditional), however, no new analysis was carried out in the development of the NDC, which utilised analysis from the NC3.

Other mitigation targets that exist in Jordan include:

- Local SE-CAP targets: Greater Irbid has committed to reduce emissions by at least 40 % below 2015 levels by 2030 (conditional). Aqaba and Karak have also adopted this 40% target, but as a secondary scenario.
- Amman has committed to net zero emissions by 2050 in the ‘Amman Climate Plan’
- The National Energy Strategy 2020 – 2030 aims to reduce CO₂ emissions by 10% by 2030.

There is no specific national mitigation plan so far in Jordan. Nevertheless, Jordan has identified a number of mitigation measures, specified through sectoral initiatives to achieve the national development priorities (such as the measures specified in the NC3) and has also produced a set of prioritised NDC actions⁴⁵ for both mitigation and adaptation. The prioritised NDC actions highlight **energy, transport, industry and waste as strategic climate priorities for mitigation**. A technology needs assessment⁴⁶ takes this one step further, by considering the technologies that will be most important to both mitigation and adaptation efforts in Jordan. The assessment highlights the importance of **renewable energy sources (in particular, solar PV and solar thermal) and transport infrastructure** to Jordan’s mitigation priorities.

3.5.2.4 Future mitigation pathways

Countries LTSs should include a pathway and actions for decarbonisation. This requires modelling of decarbonisation pathways, and likely mitigation measures for each sector. It is also important to determine when emissions are expected to peak and by when they can be phased out under each

See Annex 4 for details on modelling future emission pathways

⁴⁵ Ministry of Environment (2020), “NDC Prioritization List”. Provided to the NDC Partnership

⁴⁶ Ministry of Environment (2016), “Technology Needs Assessment”: <https://tech-action.unepdtu.org/wp-content/uploads/sites/2/2017/06/jordan-tna-report-march-2016.pdf>

pathway. The earlier emissions peak and the sooner they are phased out, the more ambitious mitigation actions will need to be implemented.

Annex 4 on Modelling tools and mitigation provides further details and analysis of Jordan’s existing and future emissions modelling needs and potential mitigation pathways, but a summary is included here. This was not possible in the scope of this work to undertake modelling of future pathways. However, this section instead presents a summary of indicative pathways and priorities for Jordan.

Given that different mitigation measures and their scale will lead to different outcomes, this mitigation pathways analysis is grouped around three types: a baseline, moderately ambitious and ambitious, shown in Table 3-10. This can provide inspiration for Jordan in defining its likely future emissions pathway.

Table 3-10: Possible pathways for modelling decarbonisation of the Jordanian economy

Pathway	Description	Possible dates for key milestones
1. Baseline pathway	Includes all current plans and policies adopted in Jordan without any further increase in the level of decarbonisation ambition	Absolute emissions continue growing beyond 2040
2. Moderately ambitious decarbonisation pathway	Suggests an increased level of mitigation actions, particularly in the main emitting sub-sectors	Reaching emissions peak before 2040 and fully decarbonising by approximately 2070
3. Ambitious decarbonisation pathway	Includes very ambitious measures in all sectors	Reaching emissions peak before 2030 and fully decarbonising by 2050

While the years chosen for emissions peak and full decarbonisation are indicative only, the logic embodied by these scenarios is widely used to model and understand implications of each different mitigation ambition levels. For example, the assessment undertaken by IRENA (2020)⁴⁷ which considered different scenarios for the global energy sector to decarbonise in line with the 1.5°C scenario by 2050, developed scenarios similar to those listed in the table above. These scenarios include the “Planned Energy Scenario” which relies on the currently announced decarbonisation policies which aligns with suggested pathway 1 and Transforming Energy Scenario which relies on ambitious yet reasonable decarbonisation which aligns with suggested pathway 2. Given that this report offers regional projection for the Middle East and North Africa region (MENA) it is a key reference for this initial analysis.

Each of these scenarios will require implementation of mitigation measures. Mitigation measures and any quantitative estimates grouped under these pathways in the analysis are indicative only and were selected to provide an idea of what these scenarios can entail. Further data gathering, analysis and modelling will be required for more precise pathway formulation. At this stage however, the analysis presented below suggests what types of measures could be considered for each of these scenarios for Jordan. A summary of the assumptions for the pathways is summarised in Table 3-11 below and shown in Figure 3-5. Further details of these scenarios and modelling approaches can be found in **Annex 4**.

It should be noted that the assumptions for the uptake of renewables align with the National Energy Sector Strategy 2020-2030, the most recent and important energy sector document to consider in the mitigation pathway development process. However, the assumptions for nuclear energy uptake do not align with the National Energy Sector Strategy – they are instead taken from Jordan’s First Biennial Update Report, which has since been superseded by more recent strategies. The inclusion of nuclear power here is intended to illustrate the diversification of energy sources needed to mitigate Jordan’s energy sector emissions, but this option should be carefully discussed with government and

⁴⁷ IRENA. 2020. Energy transformation 2050. Available at: <https://www.irena.org/publications/2020/Apr/Global-Renewables-Outlook-2020>

stakeholders before being considered for inclusion in LTS mitigation pathways. Similarly, the assumptions for oil shale use here do not align with the National Energy Sector Strategy, which states that oil shale accounted for 15% of electricity generation in 2020 with this contribution to the energy mix planned to persist to 2030. Here, we have assumed decreased oil shale use in the more ambitious scenarios because this share of oil shale in the energy mix is not compatible with decarbonisation goals.

It is important to note that these assumptions and pathways are intended to be illustrative rather than actual recommendations - it will be very important to carefully consider whether the assumptions in the following table are truly appropriate within the Jordanian context, and whether they are still relevant to the most recent national strategies at the time of pathway development.

Table 3-11: Illustrative assumptions for suggested pathway

Sector	1. Baseline pathway	2. Moderately ambitious pathway	3. Ambitious pathway
	<i>Absolute emissions continue growing beyond 2040</i>	<i>Reaching emissions peak before 2040 and fully decarbonising Jordanian economy by approximately 2070</i>	<i>Reaching emissions peak before 2030 and fully decarbonising by 2050</i>
Energy			
Transport	<ul style="list-style-type: none"> • Low levels of EV uptake <ul style="list-style-type: none"> ○ Electrification of public fleet • Support for BRT & other modes of public transport 	<ul style="list-style-type: none"> • Moderate level of EV uptake: <ul style="list-style-type: none"> ○ Moderate investment in EV charging infrastructure ○ Other policies encouraging the use of EV (access priorities, etc) ○ Electrification of public fleet • Support for BRT & other modes of public transport 	<ul style="list-style-type: none"> • High level of EV uptake: <ul style="list-style-type: none"> ○ High investment in EV charging infrastructure ○ Economic policies encouraging the use of EV (subsidies, taxes on conventional vehicles, access priorities, etc) ○ Electrification of public fleet • Support for BRT & other modes of public transport
Power generation	<ul style="list-style-type: none"> • Energy consumption increases significantly due to increase reliance on domestic energy sources • Renewables achieve 30% by 2030 and continue growing through to 2050 • Nuclear power reaches 30% by 2030 but does not grow further • The reliance on shale oil increases to 15% by 2030 • The use of natural gas reduces 	<ul style="list-style-type: none"> • Energy consumption increases significantly due to increase reliance on domestic energy sources • Renewables achieve 50% by 2050 • Nuclear power reaches 30% by 2030 but does not grow further • Shale oil reliance decreases to 5% by 2030 • The use of natural gas reduces 	<ul style="list-style-type: none"> • Energy consumption increases significantly due to increase reliance on domestic energy sources • Renewables achieve 60% by 2050 • Nuclear power reaches 30% by 2030 but does not grow further • Shale oil is not used after 2030 • The use of natural gas reduced
Manufacturing	<ul style="list-style-type: none"> • Energy audits supported by the government produce small reduction in energy consumption 	<ul style="list-style-type: none"> • Energy audits & subsidies for energy efficient equipment supported by the government produce moderate reduction in energy consumption 	<ul style="list-style-type: none"> • Energy audits, subsidies for energy efficient equipment, support for electrification and biofuels deployment supported by the government produce moderate reduction in energy consumption & emissions
Other	<ul style="list-style-type: none"> • Energy efficiency improvements through implementation of green building codes • Lower support for RE and EE projects in buildings 	<ul style="list-style-type: none"> • Energy efficiency improvements through implementation of green building codes • Moderate support for RE and EE projects in buildings 	<ul style="list-style-type: none"> • Higher energy efficiency improvements through implementation of more stringent green building codes • High support for RE and EE projects in buildings

Waste			
Waste	<ul style="list-style-type: none"> Reduction of landfilled waste to 60% by 2030 and gradual reduction after that 	<ul style="list-style-type: none"> Reduction of landfilled waste to 45% by 2030 and gradual reduction after that Small scale implementation of methane capture and use 	<ul style="list-style-type: none"> Reduction of landfilled waste to 30% by 2030 and gradual reduction after that Large scale implementation of methane capture and use
Other			
Other: CCS & natural sinks	<ul style="list-style-type: none"> No use of CCS or increasing carbon sinks 	<ul style="list-style-type: none"> Increasing carbon sinks 	<ul style="list-style-type: none"> Increasing carbon sinks Deployment of CCS after 2030

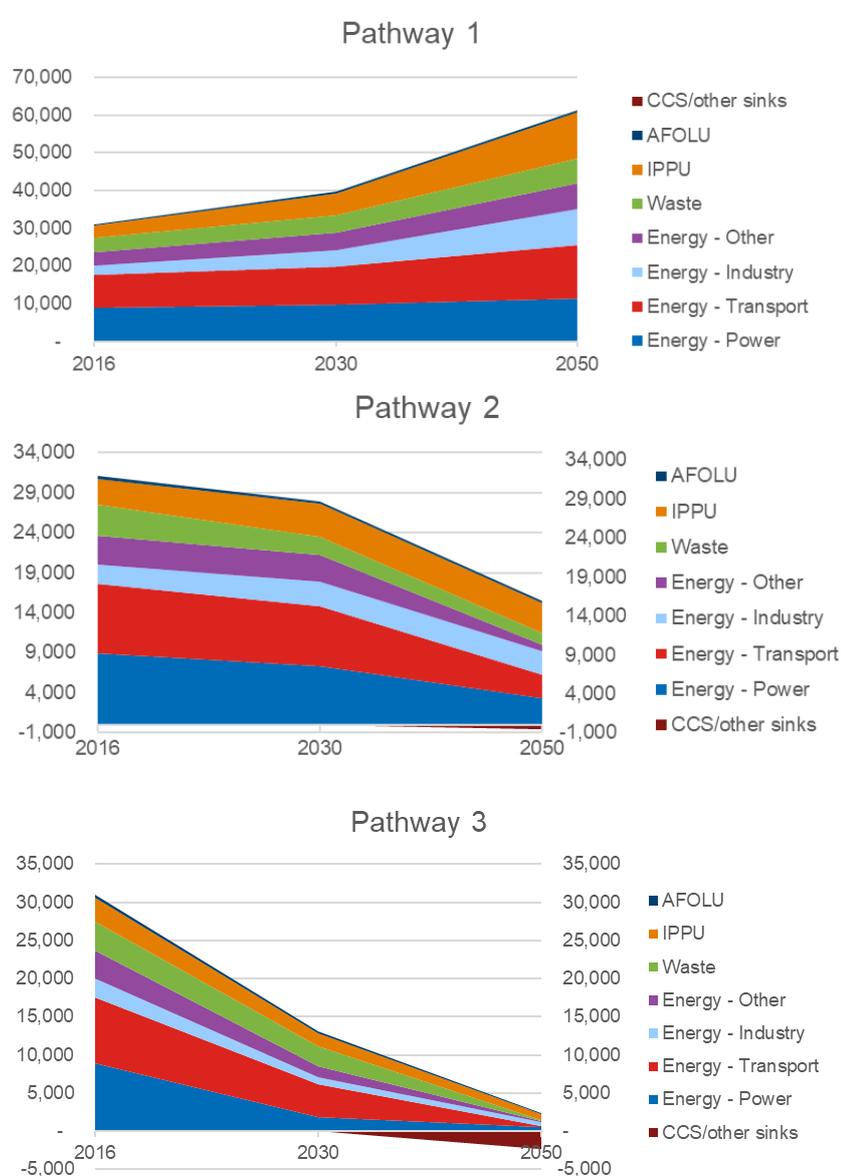


Figure 3-5: Indicative decarbonisation pathways for Jordan

Source: Developed by Ricardo Energy and Environment

Key issues that are facing Jordan in its decarbonisation journey, and that intersect with adaptation include:

- Decarbonisation of the energy sector, which accounted for 76% of total national emissions in 2016⁴⁸. With most existing energy sector strategies only taking a short- or medium-term focus, this will be an important priority sector for the LTS. However, Jordan currently suffers from issues surrounding surplus electricity, which may make the uptake of renewable sources of energy seem unnecessary and unattractive to policymakers. Energy storage solutions being considered include hydro-pumped storage, which is included in Jordan's prioritised list of NDC Actions⁴⁹. However, this action is likely to result in maladaptation – the dam is planned to be constructed in an area already receiving low rainfall and is likely to result in significant depletion of already scarce water resources.
- The water sector is Jordan's largest consumer of electricity, accounting for about 15% of the country's energy production⁵⁰. Contributing to this high energy consumption is the geographical distance between water sources and consumers, as well as the challenging hydrogeology and topography of the country⁵¹. Combined with high energy consumption and costs there is a significant threat to the security of water supply to the population. The National Water Strategy (2016-2025) plans to reduce the energy consumption of the water sector by 15% by 2025⁵² and it is clear that improving the resilience and efficiency of the water sector will be important for future mitigation efforts also.

3.5.3 Adaptation context

Full analysis in
Annex 3

Jordan is considered the second poorest country in the world in water sources⁵³, with water availability expected to decrease in the long term as a result of climate change. Other climate hazards and long-term events such as floods, heatwaves and overall changes in temperature also threaten to impact all sectors of the economy. This includes sectors for which adaptation actions have not yet been considered, such as energy, transport and built infrastructure.

Furthermore, the pressure its resources has been increasing due to the fast population growth rate, massive influxes of refugees from neighbouring countries and rapid economic development.

The full extent of Jordan's vulnerability to climate change and potential risks resulting from slow-onset and extreme events are recorded in **Annex 3** and summarised in the sections below.

3.5.3.1 Jordan's vulnerability to potential climate impacts

As a result of the vulnerability assessment recorded in Annex 3, sectors were provided a vulnerability score from 1 to 5 (least to most vulnerable). Table 3-12 Summary of Jordan's vulnerability assessment by sector, subsector and location, records the outcome of this assessment.

No sectors were rated below three, meaning that they are all vulnerable to the potential impacts of climate change. The most vulnerable sectors (rated 5) are water, transport, forestry and ecosystems. Within business activity, tourism is also considered highly vulnerable.

⁴⁸ Unpublished data from Jordan's Second Biennial Update Report to the UNFCCC, not yet submitted

⁴⁹ Ministry of Environment (2020), "NDC Prioritization List". Provided to the NDC Partnership

⁵⁰ UNFCCC (no date), "NAMA: Improvement of Energy Efficiency in the Jordanian Water Sector (IEE)". Available at: https://www4.unfccc.int/sites/PublicNAMA/_layouts/mobile/dispsform.aspx?List=162696e7-ba65-46a5-8070-883d26e0df6b&View=fff371d2-781e-44c5-bf33-bef0c4e10dc7&ID=18

⁵¹ GIZ (no date), "Increasing energy efficiency in the water sector", Available at:

<https://www.giz.de/en/worldwide/69100.html#:~:text=In%20fact%2C%20the%20water%20sector,energy%20consumption%20in%20the%20country.&text=The%20National%20Water%20Strategy%202016,15%20per%20cent%20by%202025.>

⁵² Ministry of Water and Irrigation (2016), "National Water Strategy 2016-2025",

<http://extwprlegs1.fao.org/docs/pdf/jor156264E.pdf>

⁵³ Combaz, E. (2019). Jordan's environmental policies and engagement on climate change. K4D Helpdesk Report. Brighton, UK: Institute of Development Studies.

https://assets.publishing.service.gov.uk/media/5d30a131ed915d2ff003b781/619_Jordan_Environment_Policies_and_Engagement.pdf

Although agriculture and health are considered slightly less (yet still highly) vulnerable than the water sectors, their dependency on water resources implies that any potential impacts on the water sector may be exacerbated.

Table 3-12 Summary of Jordan's vulnerability assessment by sector, subsector and location

Sector	Overall vulnerability	Sub-sectors (regions)	Vulnerability
Water	4.9	Water supply (S)	5
		Water supply (N)	5
		Surface water management (S)	5
		Surface water management (N)	5
		Groundwater management (S)	5
		Groundwater management (N)	5
		Water collection (S)	5
		Water collection (N)	5
		Wastewater treatment	4
Agriculture	4.0	Crops (N)	5
		Crops (S)	5
		Livestock (N)	3
		Livestock (S)	3
Fisheries	3.5	Marine fishing	4
		Aquaculture	3
Forestry	4.5	Public forest management (NW)	5
		Private forest management (N-highlands)	4
Ecosystems	4.8	Terrestrial ecosystems (S)	5
		Terrestrial ecosystems (N)	5
		Freshwater ecosystems	5
		Coastal ecosystems	4
Health	4.0	Physical health (S)	4
		Physical health (N)	4
Built Infrastructure	4.0	Other (Aqaba)	4
		Other (Amman/Salt)	4
		Buildings (N)	4
		Buildings (S)	4
Transport	5.0	Roads (N)	5
		Roads (S)	5
Energy	3.0	Electricity	3
		Gas (Aqaba)	3
Business	4.0	Sales and services (mainly Amman)	4
		Tourism (Petra, Dead Sea, Aqaba)	5
		Financial (mainly Amman)	3
Manufacturing	3.0	Plastics and plastic products (N)	3
		Plastics and plastic products (S)	3
		Other (N)	3

		Other (S)	3
Mining and Quarrying	3.0	Mining (N)	3
		Mining (SW)	3
		Quarrying (Jerash-Petra)	3

3.5.3.2 Synthesis of climate scenarios in Jordan

An assessment of existing climate modelling studies was undertaken to determine the future climatic changes likely to occur in Jordan. A summary of findings from this assessment is provided in [Table 3-13](#) below, while Figure 3-7 and Figure 3-6 show predicted regional variation in temperature and precipitation changes.

See [Annex 3](#) for more detailed results, and for details of the climate models used by each study.

Table 3-13: A summary of a selection of climate modelling studies into future climate change in Jordan. Information is synthesised from Ministry of Environment (2014), WHO (2015), and RICCAR (2017).

Parameters	RCP2.6		RCP4.5		RCP8.5	
	2050	2100	2050	2100	2050	2100
Temperature	+1.7°C	+1.7°C	+1.2 to 1.5°C	+1.5 to 2.1°C	+1.7 to 2.9°C	+3.2 to 5.9°C
Precipitation	NA	NA	-4 to -15%	-7 to -25%	-7 to -15%	-13 to -22%
Drought	+ 5 days	+ 5 days	NA	+ 30 to 40 days	NA	+ >40 days
Floods	No significant change	No significant change	No significant change	No significant change	+ 4 days with precipitation >20mm	+ 8 days with precipitation >20mm
Heat Waves	45 days per year	45 days per year	NA	NA	75 days per year	200 days per year

These changes will result in numerous climate risks including:

- Extreme heat
- Heatwaves (i.e., long periods of extreme heat)
- Drought (i.e., long periods of low rainfall)
- Extreme weather events (e.g. snowstorms, flash floods)
- Sea-level rise (limited to Aqaba, Jordan's only coastal region)

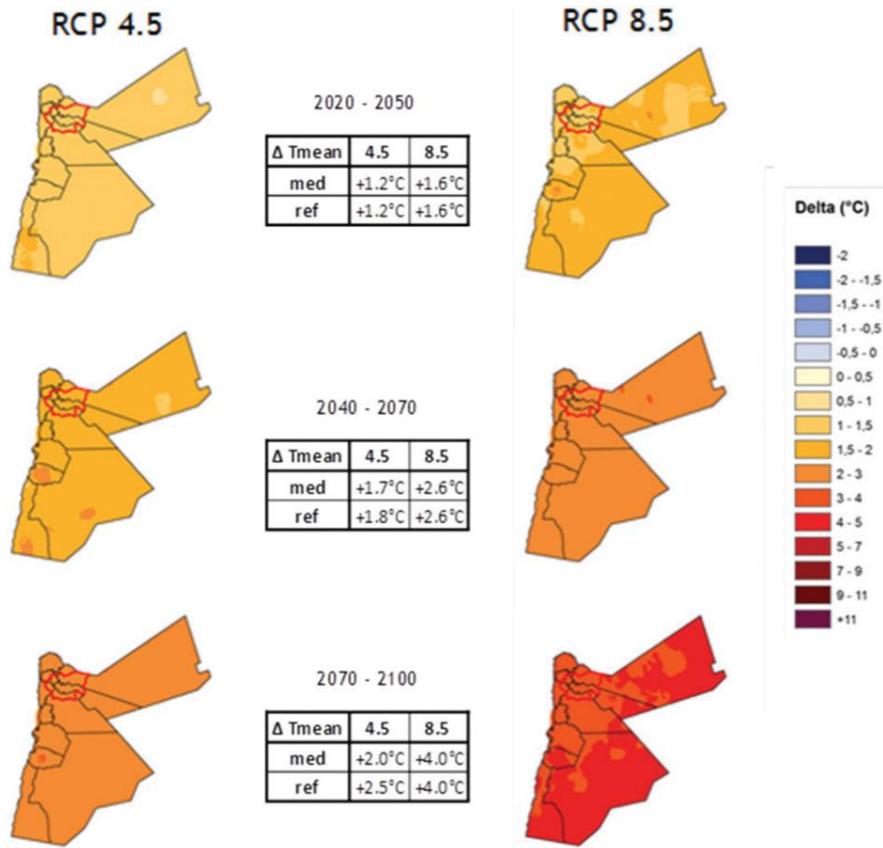


Figure 3-7: Predictions of future mean surface air temperature change in Jordan up to 2100

Source: Third National Communication⁵⁴

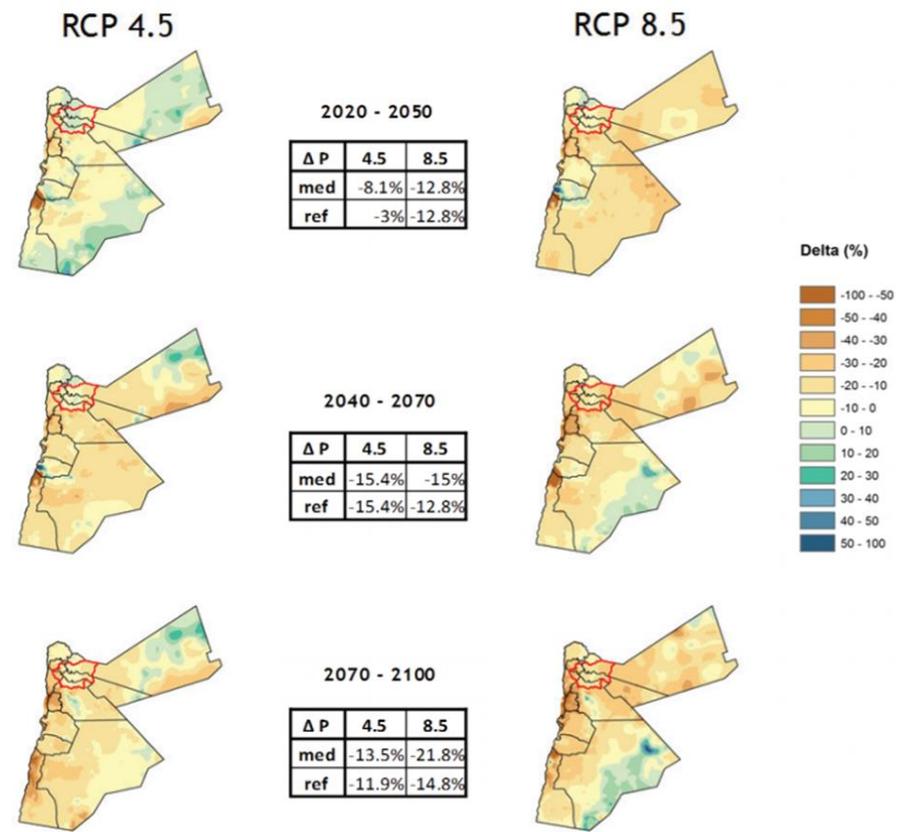


Figure 3-6: Predictions of future mean precipitation change in Jordan up to 2100

⁵⁴ Ministry of Environment (2014) Third National Communication to the UNFCCC. <https://unfccc.int/resource/docs/natc/jornc3.pdf>

3.5.3.3 Potential climate impacts and their risk

Having identified potential hazards, their likelihood and magnitude, sectors have been provided a risk score from 1 to 5 (least to most at risk). The risk score reflects the exposure of key vulnerable assets to hazards and the resulting potential impacts, and the likelihood of the hazards occurring.

Table 3-12 shows the outcome of this assessment. Jordan's exposure to hazards and risks is discussed in detail in **Annex 3**. As a result of hazards likelihood and geographical differences in climate projections, water supply and water management is most at risk in the Southern region rather than in the North. Other sectors particularly at risk include agriculture (crops in particular), marine fishing, public forest management, physical health, buildings and roads, and electricity.

Gender and climate impacts

Population groups and key assets exposed to hazards are identified in the detailed assessment for each sector. However, **in all cases, women are particularly exposed**.

Indeed, the impacts of climate change are not gender neutral. Globally, women and girls are disproportionately affected by the impacts of the climate crisis, as existing vulnerabilities are intensified and intersect with a range of social, economic and political inequalities. A business-as-usual approach is likely to exacerbate existing inequalities and limit the opportunities to develop gender equality.

For example, in the health sector in particular, potential impacts may be larger on women, as they are often responsible for caregiving and for sourcing water for family and communities. In the agricultural sector, climate impacts may also be felt more largely, as women have limited access to land ownership, but represent a large proportion of agricultural workers. Women are also often responsible for water harvesting at a household level and for agricultural practices

Table 3-14 Summary of Jordan's risk assessment by sector, subsector and location

Sector	Overall risk	Sub-sectors (regions)	Risks
Water	4.2	Water supply (S)	5
		Water supply (N)	4
		Surface water management (S)	5
		Surface water management (N)	4
		Groundwater management (S)	5
		Groundwater management (N)	4
		Water collection (S)	4
		Water collection (N)	3
		Wastewater treatment	4
Agriculture	4.3	Crops (N)	5
		Crops (S)	4
		Livestock (N)	4
		Livestock (S)	4
Fisheries	4.5	Marine fishing	5
		Aquaculture	4
Forestry	4.5	Public forest management (NW)	5
		Private forest management (N-highlands)	4
Ecosystems	4.0	Terrestrial ecosystems (S)	4

		Terrestrial ecosystems (N)	4
		Freshwater ecosystems	4
		Coastal ecosystems	4
Health	4.5	Physical health (S)	5
		Physical health (N)	4
Built Infrastructure	4.5	Other (Aqaba)	4
		Other (Amman/Salt)	5
		Buildings (N)	5
		Buildings (S)	4
Transport	5.0	Roads (N)	5
		Roads (S)	5
Energy	4.5	Electricity	5
		Gas (Aqaba)	4
Business	4.0	Sales and services (mainly Amman)	4
		Tourism (Petra, Dead Sea, Aqaba)	4
		Financial (mainly Amman)	4
Manufacturing	3.5	Plastics and plastic products (N)	4
		Plastics and plastic products (S)	3
		Other (N)	4
		Other (S)	3
Mining and Quarrying	3.3	Mining (N)	4
		Mining (SW)	3
		Quarrying (Jerash-Petra)	3

Note on the use of qualitative and quantitative data in the roadmap vulnerability and risk assessment:

The assessment undertaken here and explained more in **Annex 3**, utilises a qualitative approach. This ensured that the assessment could be undertaken rapidly and efficiently, where data was not available. This also avoids providing a false sense of certainty though the use of numbers, and also allows for some of the nuances and experiences to be captured.

However, future estimates of impacts using a mixture of both qualitative and quantitative assessments, could be done through the following steps:

1. Identify by sector all the factors that may make it sensitive to climate change and inform them quantitatively and qualitatively, as some factors may not be quantifiable (i.e. dependence on external resources may best be estimated qualitatively through stakeholder consultations).
2. Identify by sector all the factors that may make it able to adapt to climate change, and inform them quantitatively and qualitatively.
3. Identify by location (if appropriate) the slow-onset changes and potential hazards that will occur in Jordan. To avoid increasing the level of uncertainty, it is recommended that (i) the data is not focused on one preferred future but rather considers changes under all RCP scenarios, and (ii) that spatial disaggregation is not too granular as the smaller the scale, the greater the uncertainty
4. Identify by sector the assets that will be exposed to these slow-onset changes or hazards and estimate their importance quantitatively and qualitatively (cultural, economic, social importance)

At this stage, the sensitivity, adaptive capacity and exposure assessments give an insight into the magnitude of impacts that a given sector may experience. This provides a basis on which to identify which to prioritise action/investments.

To quantify the impacts economically, the LTS team should identify a list of economic indicators for each systems or asset exposed, identify their historical relationship with past climate, and estimate how much future values may deviate from historical relationship as a result of the changing climate, the level of vulnerability and the level of exposure.

3.6 Challenges and bottlenecks to consider when developing the LTS



Jordan's national circumstances may pose challenges for the preparation and implementation of the LTS. Ensuring that Jordan's existing national development goals are well considered in the LTS may also pose challenges. The following tables details some of the main challenges/bottlenecks expected and poses some potential solutions.

Appendix 1 of this document provides further details of the gaps and limitations in Jordan's climate response.

Table 3-15: Key challenges/bottlenecks related to Jordan's national circumstances, and potential solutions.

Key challenges/bottlenecks in Jordan	Potential solutions / role of the LTS
Crisis-management and reactive decision-making have generally prevailed in Jordan, with a focus on shorter term policies and reactive planning in responses to events and pressures.	Undertaking a comprehensive and inclusive longer-term planning process in Jordan is an opportunity for the country to address multiple objectives on climate, development and economic recovery and growth. Setting a long-term vision and creating an overarching country strategy to achieve this, with a pathway and key

	<p>milestones, will help to ensure that future short-term crisis responses and recovery policies can be aligned to a longer-term pathway.</p>
<p>The structure of the economy and high vulnerability to external shocks: the country is deeply linked to the global economy, importing around 90 percent of its food items and energy requirements and highly dependent on regional exchanges for water.</p>	<p>Building in self-sufficiency and resilience as priorities in the LTS, and identifying the measures needed to achieve this, is a step to helping overcome these challenges. Increasing local renewables and building a sustainable agriculture sector, for example, can provide both long time climate benefits and reduce these vulnerabilities. However, in the context of food security, a key strategy may be to increase the efficiency of food import supply chains (as opposed to focusing on self-sufficiency, which is limited by Jordan’s constrained land and water resources). It has been noted that Jordan’s current ‘food reserves policy’ (essentially a stockpiling of strategic food reserves) is economically inefficient, and focus should be placed on improving the reliability of food imports⁵⁵.</p>
<p>Energy security: historically linked to relations with neighbouring countries and is thus vulnerable to external shocks and outside political events. Despite the favourable conditions for solar and wind, Jordan’s energy mix is still dominated by imported fossil fuels and natural gas. The new Energy Strategy also continues the exploitation of oil shale which would not be compatible with long-term decarbonisation pathways.</p>	<p>Future energy strategies and the LTS will need to prioritise investment in renewable energy, the reduction of energy consumption via increasing energy efficiency, and also synergic agreements with other countries. The role of oil shale in long term pathways will need to be included in modelling to understand the rate at which it could continue to be used within different pathway options.</p>
<p>There is a commitment to pay for the cost of capacity for the power stations, even if their operation is suspended, according to the Energy Purchase Agreement which is based on the principle of ‘take or pay’. Energy efficiency measures have reduced demand resulting in surplus power</p>	<p>As the LTS is a strategy for 2050, it is likely that with growing electrification e.g. electric vehicles, demand and supply will be brought closer in line which might help to close the current gap. The LTS modelling should ensure it explores this.</p>
<p>The effects of climate change and climate vulnerability will complicate the management of shared resources of water.</p>	<p>Identifying adaptation strategies for water for the longer term will help to pre-empt challenges and identify the necessary steps to reduce these impacts. In addition, considering water resources vulnerability to climate change, future rainfall projections and future water demand in all water-dependant sectors’ planning will help prevent increasing the vulnerability of water resources.</p>
<p>Syrian refugee crisis: there is a need to consider this population in all short-term planning and reflect on the impact of this for long term planning also. In some areas in Mafraq and Irbid, Syrian refugees helped the local community in</p>	<p>Jordan needs to plan for the whole population in terms of mitigation and adaptation - i.e. planning sustainably for the worst-case scenario of an increasing population with limited resources. Ensuring the LTS is developed inclusively and takes account of development needs, including</p>

⁵⁵ Fathallah, H. and Robertson, T. (2021) ‘The Cost of Food Security in Jordan’. Available from: <https://carnegieendowment.org/sada/84424>

<p>agriculture for example, and in cities like Amman they have established lots of businesses.</p>	<p>the impacts of regional crises, will help ensure it is a more realistic strategy.</p>
<p>National development goals are a higher priority than climate change (e.g. economic growth, SDGs)</p>	<p>The LTS vision and strategy should incorporate growth plans and the SDG agenda. Through the vision process and climate strategy, the linkages between SDGs and development and climate should be emphasised to ensure that the benefits are understood.</p>
<p>COVID-19 crisis placing unprecedented demands on society, decision-makers and the economy. There is 'no time for long term planning'.</p> <p>Additionally, the prolonged decline in economic activity from domestic lockdowns could escalate high unemployment levels.</p> <p>Further, financial support from donors may be directed to the health sector and economic recovery to mitigate the effects of the pandemic, and this may negatively affect the availability of the required support from international bodies or public budgets at the national level to implement projects to protect the environment in general and climate change projects in particular.</p>	<p>If the LTS process can be aligned with parallel recovery and activities for a "green and sustainable recovery", for example ensuring that bounce-back from COVID-19 is still aligned with the long-term pathway, there can be win-wins. This will also help to ensure that climate change is not de-prioritised as a result of these pressures, provides some longer-term policy and investment certainty, and an international signal of decarbonisation intent to decision makers, businesses, investors and the international community.</p> <p>The speed of economic recovery in the medium-term however, largely depends on the evolution of the pandemic and whether reforms and strategies are put into effect.</p>
<p>Low financial capacity to implement long-term plans</p>	<p>The LTS process can be used to identify priorities and needs for the long term, and provide an overarching framework that extends to investment decisions. The LTS itself is not an implementation plan, but provides a framework or priorities for integration into sectoral plans. In this sense, the LTS merely provides a lens for decision-making and signals a clear intent and direction to businesses and the international community. Furthermore, specific opportunities such as linking long-term planning to Article 6 may provide an opportunity for financing/investment and to create projects with a positive impact.</p>
<p>Human resources and technical capacity</p>	<p>Jordan has low human and technical capacity and departments and ministries are already overstretched. The LTS process should ensure that it builds on existing processes as much as possible, and seeks high level political support from the outset to ensure it is prioritised. As has been said, the intention is that it acts as a strategic document and guidance for future development and sectoral strategies, rather than placing additional burden or responsibility on departments with regards to implementation.</p>

Table 3-16: Key challenges/bottlenecks related to Jordan's existing work on climate change, and potential solutions.

Key challenges/bottlenecks in Jordan	Potential solutions
<p>Gaps and weaknesses in existing work, for example, around data and tracking of activities</p>	<p>The LTS process cannot address all these challenges but will provide another opportunity to review and identify the biggest weaknesses and should put in place a plan to make incremental improvements. Further, the LTS might provide an opportunity to 'bring together' various climate activities and harmonise data, priorities and governance to ensure greater consistency over time.</p>
<p>Extending the time horizon of existing plans while ensuring long-term plans are compatible with existing plans (mostly covering only up to 2030)</p>	<p>The LTS is a long-term document that is intended to be strategic, providing a guiding framework for shorter term implementation focussed plans. It should support the NDC in terms of providing the long-term pathway and goals that the NDC should seek to align with. An LTS does not seek to replace existing plans, but provide a longer-term outlook and set of priorities for which sectoral plans, targets and actions can be aligned to.</p>
<p>Climate action in Jordan lacks guiding principles: for example, case projects listed in the NDC include those derived from Jordan's NC3, and others have been selected from sectoral strategies, without guiding principles that would ensure strategic prioritization and the targeted mobilization of co-benefits between adaptation, mitigation and sustainable development.</p>	<p>Guiding principles can be provided by the LTS, so by developing an LTS Jordan would effectively address this issue. The NDC would then follow these guiding principles. Existing and new actions can then be aligned to these principles to ensure consistency.</p>
<p>A risk assessment mechanism was used in the NC3 to identify priorities, which were then translated into the NDC, but this mechanism fell short in properly identifying all relevant climate risks (e.g., for the agriculture, water and health sector).</p>	<p>Whilst improving the quality, scale and scope of climate risk assessments could be recommended, this leaves much room for uncertainty when planning, especially in the context of the long term where projections might change considerably. It would be recommended instead to prioritise and enhance the vulnerability assessment. The approach undertaken for this report could be built upon.</p>
<p>Jordan's mitigation scenarios to date are set to achieve only a small reduction on the BAU scenario and are projecting an increase in net emissions over the period. This is not compatible with either the scientific consensus on the need to deliver net reductions in emissions to avoid dangerous climate change, even in a 'peak-plateau-decline type scenario, and falls far short of the reductions required for a 'net zero' 2050 pathway.</p>	<p>In order to deliver a low-emissions future, Jordan needs to both significantly increase its mitigation efforts, and undertake updated modelling to achieve this. The NDC 2030 target and current mitigation scenario projections fall short of the interim reductions that will be required.</p>
<p>A number of data challenges were faced in the compilation of the GHG emissions inventory,</p>	<p>Data gaps are a common challenge for all countries and there is no easy solution. The</p>

<p>baseline, and mitigation scenarios which are still present in Jordan and will need to be considered in the planning of future activities. These can be summarized as follows:</p> <ul style="list-style-type: none">• Gaps in time series (no complete time series in some sub-sectors)• Inconsistency and different classifications at data sources and different units• Poor coordination in providing the required data• No coordination with the private sector to provide the required data	<p>principles of 'TCCCA' should be applied: Transparency, Completeness, Comparability, Consistency, Accuracy' with a focus on transparency and completeness. Ensuring that limitations are identified and highlighted, and strategies are put in place to address these in future, is important. Likewise, undertaking uncertainty assessments, multiple scenarios etc can provide a more flexibility and confidence.</p> <p>The LTS process could also be used to enhance data, particularly in relation to institutionalising data supply and management through improving technical capacity, ensuring good documentation and consistency and permanence of experts in relevant ministries and departments.</p>
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4 Long-term vision for Jordan

This section summarises the key needs, approaches and information for defining a long-term vision for Jordan. It provides a suggested framework and approach to the vision, and a suggested set of themes to form a vision statement. This is intended to act as a guide and a ‘starting point’ and can be adapted as needed through consultation processes.

See Annex 2 for more detailed review and analysis of Jordan’s existing visions

Navigation



Regarding the “Long-term vision” element of the LTS, this section provides:

- **Role of the long-term vision**
 - o A description of the role that this element plays in the LTS.
- **International examples**
 - o Examples of how what this element contains in other LTSs.
- **Framework for Jordan’s long-term vision: what might it include?**
 - o A framework or approach to how this element may be presented in Jordan’s LTS and what it might include.
- **Information to develop Jordan’s long-term vision**
 - o Core information relevant to the content of this element for Jordan.
- **Recommendations for the LTS vision**
 - o A summary of recommendations for developing this element in Jordan’s LTS.
- **Challenges and bottlenecks**
 - o Potential challenges and bottlenecks to consider when developing this section.

This section is supported by **Annex 2**, which provides a review and assessment of Jordan’s visions and strategies.

4.1 Role of the long-term vision

“The process of an LTS development can help countries to facilitate the dialogue among stakeholders on how to initiate and translate these [resilient, low carbon] ambitious transitions into action, considering country-specific circumstances. The LTS development process thus helps to develop a common long-term vision that integrally addresses environmental, economic and just transition aspects.”



The most important element of a LTS is its vision. This will typically be captured in a vision statement which describing the overarching goal of the strategy. A good vision statement would be simple, transparent and easy to communicate.

The process of developing the vision is often more important than the final vision itself. Foresight into the future is never perfect, and rarely accurate, but undertaking a visioning exercise allows for the stepping outside of present-day issues and concerns, barriers and challenges, to define a preferred goal that can then act as a focal point to orient decision-making around.

The vision should reflect the main elements of the strategy itself. Specifically, it should be focussed on the **long-term**, it should reflect the climate change aspirations of the country in terms of its resilience to **climate change** and greenhouse gas **emissions** mitigation, and it should recognise that these aspirations need to be aligned with the country’s **development** goals.

The vision statement can therefore be considered the *short description of a country's aspirations and the wider impact it aims to create*. It should be a guiding beacon to citizens and other stakeholders within and outside the country, and set out the principles to underpin all future decision-making and ensure the achievement of a resilient low-carbon future.

The vision statement can be further supported by more detailed description and analysis of different components of the vision within the LTS – outlining in subsequent chapters for example, the pathway and how it can be achieved, and how it aligns with other policies, strategies and objectives. This can also integrate wider concerns and objectives, such as climate adaptation, gender and inclusivity, clean growth and so forth. The vision is therefore the “heart” of the LTS, fundamentally connected to all other aspects and the goal that decision making is oriented around. This is why it is critical that the LTS vision is not only developed in a participatory manner but is also integrated into and with existing and future strategies and policies of the country.

4.2 International examples

“Ambition hinges not just on setting a long-term aspirational goal but also on translating this goal into a society-wide vision”⁵⁶



To inform the vision for Jordan’s LTS it is useful to understand the different visions that have been developed by other countries and included in their LTS. Of the 28 Parties who have submitted an LTS so far, 20 of these are Annex 1 Parties⁵⁷ (as of 14/01/2021). Many LTSs define their vision in terms of a quantified mitigation target for 2050 (often net-zero emissions by 2050, or heavily reduced emissions coming close to this goal). South Africa⁵⁸ (a notable exception to this) don’t go so far as stating a quantified mitigation target, instead focusing on following a “low-carbon growth trajectory” and enhancing climate resilience, with intentions to eventually move towards a net-zero goal. Some countries (e.g. UK) also state interim mitigation targets, that aim to keep the country on course to achieve their long-term climate goals.

Alongside a mitigation component, LTS visions are increasingly including adaptation elements. Since many countries have high climate vulnerability, and often relatively low emissions, that may choose to prioritise adaptation efforts in their LTS (taking an “adaptation-first” or “climate resilient” approach; e.g. Uganda⁵⁹). Often, a combination of these two approaches is taken, with countries defining a long-term mitigation target and then linking this target to complementary adaptation efforts (or a national adaptation plan; NAP) and considering the potential for synergies between the two (good examples of this approach are provided by the LTSs of Fiji⁶⁰ and Costa Rica⁶¹). A preferred approach for low-emitting highly vulnerable countries is to base the long-term vision on resilience objectives, while considering how mitigation may contribute to ensuring that these can be achieved while keeping emission levels low. Integrating adaptation into long-term strategies is considered key to ensuring continued socioeconomic development in the face of climate vulnerability⁶² and will likely be a key consideration for Jordan’s LTS.

⁵⁶ Tubiana, L. WRI Expert Perspectives: In Climate Action, as in Chess, Forethought Wins <https://www.wri.org/climate/expert-perspective/climate-action-chess-forethought-wins>

⁵⁷ UNFCCC (no year), “Submitted Long-term Strategies”: <https://unfccc.int/process/the-paris-agreement/long-term-strategies>

⁵⁸ Government of South Africa (2020), “Low Emission Development Strategy”: <https://unfccc.int/sites/default/files/resource/South%20Africa%27s%20Low%20Emission%20Development%20Strategy.pdf>

⁵⁹ Uganda’s LTS is currently in development – lessons are drawn from Ricardo Energy & Environment’s ongoing work in country to support the Ugandan government.

⁶⁰ Fiji’s Low Emission Development Strategy 2018-2050. Fiji Ministry of Economy with support from the Global Green Growth Institute (GGGI). https://unfccc.int/sites/default/files/resource/Fiji_Low%20Emission%20Development%20%20Strategy%202018%20-%20202050.pdf

⁶¹ Government of Costa Rica (2018), “National Decarbonisation Plan”: <https://unfccc.int/sites/default/files/resource/NationalDecarbonizationPlan.pdf>

⁶² World Resources Institute (no year), “Principles in Practice: Integrating Adaptation into Long-term Strategies”: <https://www.wri.org/climate/expert-perspective/principles-practice-integrating-adaptation-long-term-strategies>

Most long-term visions also consider the alignment of mitigation targets and other national development goals/priorities, often referencing green growth objectives or sustainable development goals as key aspects of their vision for the future. This is a possible entry point for considering adaptation, as resilience is a prerequisite of achieving the sustainable development goals.

A review of selected examples is provided in section 4.2.1 below.

4.2.1 Example visions

1. United Kingdom⁶⁹

The UK did not produce any new work for its long-term strategy, but instead utilised its “Clean Growth Strategy” from 2017. As such, the strategy does not contain a dedicated section for the UK’s long-term vision but does state a quantified target of 80% emissions reduction by 2050 relative to 1990, with interim carbon budgets every 5 years (to ensure the country is on track to meet 2050 targets). The strategy has “two guiding objectives: 1. To meet our domestic commitments at the lowest possible net cost to UK taxpayers, consumers and businesses. 2. To maximise the social and economic benefits for the UK from this transition”.

As the name of the strategy suggests, continued economic growth is a fundamental long-term objective and is integrated throughout. The strategy therefore approaches its long-term objectives via specific goals for key economic sectors, including: energy efficiency for businesses and industries; energy efficiency in residential buildings; a shift towards low-carbon transport; clean, smart and flexible power supply; low-emissions, high-productivity land; and an energy- and cost-efficient public sector. Technological innovation (in creating new high value jobs, industries, and companies) is considered crucial to achieving the long-term goals of this strategy, which focus significantly on economic and social development (aligned with environmental protection).

2. Norway⁶³

Norway does not explicitly set out a vision statement for its LTS, and notes that the LTS does not contain any new international commitments. All targets in Norway’s LTS have been taken directly from their Climate Change Act. Nonetheless, the LTS notes that Norway’s long-term goal is to transition to a “low-emission society”, with a quantified mitigation target of 80-95% emissions reduction by 2050 stated. However, it is noted that the Government has agreed to strengthen the target to 90–95% and to propose that the Parliament amends the Climate Change Act accordingly to reflect this.

Norway’s strategy also notes the importance of technological transformations to its vision for the future, and states that the transformation to a low-emissions society must also result in a development pathway that safeguards biodiversity and builds a sustainable welfare-based society.

3. Japan⁶⁴

Japan’s strategy includes a section on its long-term vision within Chapter 1, stating that “Japan proclaims a “decarbonized society” as its ultimate goal and aims to accomplish it ambitiously as early as possible in the second half of this century. Toward that end, Japan has set a long-term temperature goal of reducing GHG emissions by 80% by 2050, and will boldly take measures towards its realization”. Disruptive innovation is noted key to Japan’s long-term vision, as it will permit continued economic growth while encouraging technological transformations that will allow for a decarbonised yet thriving economy. As such, the strategy notes that “Japan formulates its long-term low GHG emission economic and social development strategy as a growth strategy”, highlighting the importance of continued social and economic development to Japan’s long-term vision for the future. This is further highlighted by objectives related to the Sustainable Development Goals, with the strategy stating that “Japan will aim to maximize the co-benefits with other SDGs in its transition to a decarbonized society”.

⁶³ Government of Norway (2020), “Long-term Low-emission Development Strategy”:

https://unfccc.int/sites/default/files/resource/LTS1_Norway_Oct2020.pdf

⁶⁴ Government of Japan (2019), “The Long-term Strategy under the Paris Agreement”:

<https://unfccc.int/sites/default/files/resource/The%20Long-term%20Strategy%20under%20the%20Paris%20Agreement.pdf>

4. Fiji⁶⁰

Fiji's strategy includes a dedicated "Vision statement" section that states that it aims to reach net zero carbon emissions by 2050 across all sectors of its economy. It references latest Intergovernmental Panel on Climate Change (IPCC) reports, such as the IPCC Special Report on the impacts of global warming of 1.5°C. It also references two Fiji Government reports (a National Development Plan (published 2017) and a Green Growth Framework for Fiji (published 2014)), stating that Fiji's transition to a low carbon economy is critical to meeting the government's development objectives (including the SDGs).

It also notes that its vision is underpinned by similar visions contained in national development frameworks, including "a better Fiji for all" which guides the Green Growth Framework report, and aims for "accelerated green growth" that is innovative, integrated, inclusive, inspires, and creates investment for transformational change. It states that these are in line with the "transforming Fiji" vision of the NDP (2017) and that the LEDS integrates emission reduction and sustainable development objectives into sustainable, low carbon, and resilient pathways

5. Costa Rica⁶¹

Costa's Rica's Plan states that decarbonization and resilience are recognized as the means to transform the current economic development model into one that is based on bioeconomy, green growth, inclusion, and on enhancing the well-being of all citizens. In order to bring this concept of "decarbonization" into practice, it states that the implemented methodology is anchored in a long-term vision of Costa Rica.

The goal of the Plan is for a decarbonized economy with net-zero emissions in 2050, in a manner consistent with the long-term goal of limiting the increase of average global temperature to 1.5°C above preindustrial levels. It acknowledges that this would require an advanced level of implementation in order to effectively achieve the main transformational processes by 2050, and so sets out three major stages to achieve this which are: a) foundations stage (2018-2022), b) inflection stage (2023-2030) and c) transformation normalization stage or massive deployment (2031-2050).

6. Finland⁶⁵

Finland does not explicitly set out a vision statement for its LTS, but states quantified mitigation targets of carbon neutrality by 2035, and an 87-90% reduction of GHG emissions by 2050. The strategy explores different scenarios that could be followed to achieve this – one relies heavily on technological advances such as negative emissions technologies, and one relies on stringent mitigation. The strategy is almost exclusively focused on climate change goals, with limited reference to alignment with other development goals beyond the mention of some potential social and economic impacts of the strategy.

7. Netherlands⁶⁶

Finland does not explicitly set out a vision statement for its LTS, instead drawing its objectives for 2050 from their Climate Act which states quantified mitigation targets of 95% GHG emissions reduction by 2050, and 49% by 2030 (as an interim target). The strategy notes that sustainability improvements and economic growth should go hand-in-hand stating that "*an attractive prospect is an integrated prospect*". In considering what the Netherlands should look like in 2050 (beyond climate change targets) the Board of Government produced an exploratory study that looked into the question of how the Paris Agreement could make the country "*wealthier, cleaner and more united*". Thus, social and economic development are also crucial to the Netherlands' long-term vision for the future. Technological innovation, transformation of the energy system, and enhancement of job opportunities are considered fundamental to achieving these objectives.

8. South Africa¹²

⁶⁵ Finland Ministry of Economic Affairs and Employment (2020), "Finland's long-term low greenhouse gas emission development strategy": https://unfccc.int/sites/default/files/resource/LTS_Finland_Oct2020.pdf

⁶⁶ The Netherlands Ministry of Economic Affairs and Climate Policy (2019), "Long term strategy on climate mitigation": https://unfccc.int/sites/default/files/resource/LTS1_Netherlands.pdf

The SA-LEDS contains an Executive Summary that outlines how South Africa, like the rest of the world, is vulnerable to the impacts of climate change. It then references the Paris Agreement and the requirement to reach global peaking of GHG as soon as possible, noting this on the basis of equity and in the context of sustainable development and efforts to eradicate poverty.

The vision statement within South Africa's LEDS is "*South Africa follows a low-carbon growth trajectory while making a fair contribution to the global effort to limit the average temperature increase, while ensuring a just transition and building of the countries resilience to climate change*".

It then references its climate change mitigation measures but avoids assigning quantitative values to its ambition to its "Peak, Plateau, and Decline" GHG emissions pathway.

Lastly, it mentions how the implementation of the Strategy will also contribute directly and indirectly to the meeting of Sustainable Development Goals (SDGs), and that the SA-LEDS is based on three key climate policy documents in South Africa, which are: The National Development Plan (NDP), The National Climate Change Response Policy (NCCRP), and a forthcoming Climate Change Bill that will form the legislative foundation for the climate change adaptation and mitigation response.

9. Republic of the Marshall Islands⁶⁷

The Republic of the Marshall Islands' (RMI) strategy references that their 2050 Climate Strategy provides a compass they can use to travel with confidence along a steady course towards the middle of this century. It sets a clear framework for progressing towards net zero greenhouse gas emissions by 2050, as well as transitioning to an economy and society that is resilient and can adapt to the inevitable impacts of climate change.

As one of the world's lowest-lying and climate vulnerable countries, adapting to climate impacts is an increasingly pressing national priority, including with respect to women, men and children in rural communities who have limited access to resources and services and so are particularly vulnerable.

It continues with referencing that the country is experiencing increasingly damaging effects from climate change and seeing more frequent and intense events, such as drought, floods and swells, and tropical cyclones and storms.

In addition, these adaptation and vulnerability issues, it also references that it has rapidly embraced renewable energy technologies and taken huge strides in energy efficiency. For example, more than 90% of the country's outer islands have now been completely solarized.

It closes its introduction to the strategy in citing "*The purpose of this 2050 Climate Strategy – which is RMI's long-term low greenhouse gas emission climate-resilient development strategy under the Paris Agreement - is to outline a long-term pathway for RMI to achieve its objectives for net zero emissions and 100% renewable energy, as well as to facilitate adaptation and climate resilience in a way that ensures the future protection and prosperity of the country and its women, men and youth.*"

10. Singapore⁶⁸

Singapore's long-term strategy "*aspires to halve emissions from its peak to 33 MtCO₂e by 2050, with a view to achieving net-zero emissions as soon as viable in the second half of the century*". The strategy highlights the importance of fostering innovation and technological transformations to its vision for Singapore in the future, with a goal to "*harness emerging technologies as they mature*" noted as one of the key "thrusts" that the LTS is built on. Another of these key "thrusts" is "*to transform our industry, economy, and society*", with green growth opportunities detailed in their own dedicated section of the LTS.

The strategy notes Singapore's historical success in this area, stating that "*geographical constraints have driven us to look into innovative and progressive ways to pursue climate action. Long before climate change became a global concern, Singapore had sought to balance economic growth with environmental protection in a mutually reinforcing manner, and not one at the expense of the other.*"

⁶⁷ Republic of the Marshall Islands (2018), "2050 Climate Strategy":

https://unfccc.int/sites/default/files/resource/180924%20rmi%202050%20climate%20strategy%20final_0.pdf

⁶⁸ Singapore National Climate Change Secretariat, "Charting Singapore's Low Carbon and Climate Resilient Future":

<https://unfccc.int/sites/default/files/resource/SingaporeLongtermlowemissionsdevelopmentstrategy.pdf>

The final of the three key “thrusts” on which the LTS is built is to “*pursue and leverage international collaborations*”.

Singapore’s high climate vulnerability means that climate resilience takes high priority in their vision for the future – opportunities to enhance climate resilience are integrated throughout the strategy, and adaptation measures intended to achieve climate resilience are detailed in their own dedicated section.

Summary examples of LTS vision statements that might be most relevant to Jordan are summarised in Table 4-1 below:

Table 4-1: Summary examples of vision statements from submitted Long-Term Strategies of other countries.

Country	Vision Statement
Fiji	<i>“Fiji aims to reach net zero carbon emissions by 2050 across all sectors of its economy”</i>
Costa Rica	<i>“Costa Rica commits to becoming a decarbonized economy with net-zero emissions by 2050”</i>
Japan	<i>“Japan proclaims a “decarbonized society” as its ultimate goal and aims to accomplish it ambitiously as early as possible in the second half of this century. Toward that end, Japan has set a long-term temperature goal of reducing GHG emissions by 80% by 2050, and will boldly take measures towards its realization.”</i>
South Africa	<i>“South Africa follows a low-carbon growth trajectory while making a fair contribution to the global effort to limit the average temperature increase, while ensuring a just transition and building of the country’s resilience to climate change”</i>
Singapore	<i>“We have put forth a long-term low emissions development strategy (LEDS) that aspires to halve emissions from its peak to 33 MtCO₂e by 2050, with a view to achieving net-zero emissions as soon as viable in the second half of the century.”</i>
Republic of the Marshall Islands	<i>“The purpose of this 2050 Climate Strategy – which is RMI’s long-term low greenhouse gas emission climate-resilient development strategy under the Paris Agreement - is to outline a long-term pathway for RMI to achieve its objectives for net zero emissions and 100% renewable energy, as well as to facilitate adaptation and climate resilience in a way that ensures the future protection and prosperity of the country and its women, men and youth.”</i>

4.2.2 Alignment with other key elements of the LTS

While there is significant diversity in the long-term visions set out by different countries, there are a number of key elements that Jordan could incorporate. These include:

- **Mitigation target for 2050:** An LTS should support the country to plan its long-term contribution to global climate change targets, which aim to limit warming to 1.5-2°C and require global GHG emissions to be reduced to net-zero by the end of the century. As such, the mitigation target for 2050 is often an important element of the long-term vision.
- **Interim targets:** Alongside a vision and quantitative for 2050, many countries have also chosen to include interim targets in their LTS, providing short/mid-term goals that will keep the country on track to meet their 2050 target. The UK, for example, provides interim carbon budgets at five-year intervals that are in line with their long-term vision of an 80% reduction in GHG emissions⁶⁹ (Figure 4-1). This may necessitate some interaction with mitigation

⁶⁹ UK Department for Business, Energy and Industrial Strategy (2018), “Clean Growth Strategy”: <https://unfccc.int/sites/default/files/resource/clean-growth-strategy-amended-april-2018.pdf>

elements of the LTS, for example, modelling the pathway and determining the ‘shape of the curve’ and therefore interim targets.

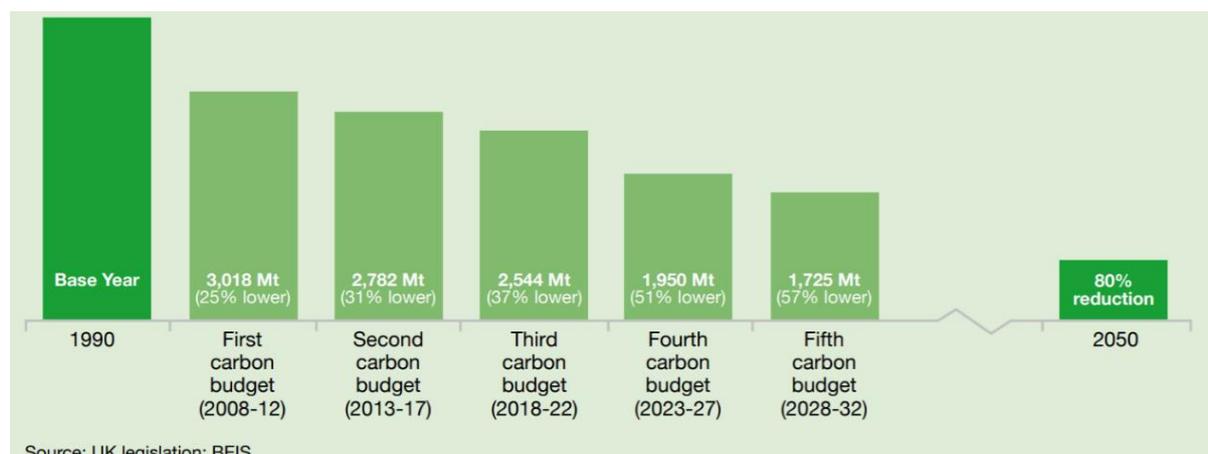


Figure 4-1: A schematic of the UK's long-term vision and interim targets. Source: UK Clean Growth Strategy
Source: UK Clean Growth Strategy⁷⁰

- Adaptation:** Whilst an LTS is framed by the Paris Agreement as a “mid-century, long-term low greenhouse gas emission development strateg[y]”, predominantly intended to support mitigation goals, countries are encouraged to be “mindful of Article 2 taking into account their common but differentiated responsibilities and respective capabilities”. Whilst the LTS vision should preferably include the country’s quantified mitigation target, there is growing recognition that the LTS should be aligned to national climate priorities, with some countries such as Uganda taking an ‘adaptation first’ approach.
- Alignment and synergies with existing plans:** As noted above, it is also common practice to link the LTS vision to NDCs and other relevant policy, as this enables evaluation of potential synergies and/or trade-offs between the measures outlined in the LTS and wider plans. Additionally, aligning the LTS with sector-specific plans is important as the achievement of national climate change goals relies on the achievement of various sectoral targets. Existing sectoral plans may also help inform the national decarbonisation pathway.

4.3 Framework for Jordan’s long-term vision: what should it include?



Based on the analysis of literature and international experience, the following recommendations are made for the key components of Jordan’s long-term vision:

Table 4-2: Components of Jordan’s long-term vision.

Vision statement component	Description and Recommendations
Societal benefits and development goals	Jordan’s vision needs to ensure it clearly connects with current and long-term development goals and challenges in the country, and is framed in inclusive, country-wide terms. It should ensure it speaks to all parts of society and regions of the country, and integrates key concepts such as justice, fairness and gender equality . This is important to ensure that the LTS is viewed as a strategy

⁷⁰ UK Department for Business, Energy and Industrial Strategy (2018), “Clean Growth Strategy”: <https://unfccc.int/sites/default/files/resource/clean-growth-strategy-amended-april-2018.pdf>

	<p>for all, and frames climate responses as something positive, bringing benefits and tackling challenges.</p>
Long-term focus	<p>Jordan’s vision needs to recognise the timeframe to which the strategy relates, and the strategy needs to cover the entire period. The UNFCCC secretariat specifically states that countries should submit “<i>mid-century, long-term low greenhouse gas emission development strategies</i>”. All the examples above and the supporting literature widely support 2050 as the appropriate ‘long-term’ date.</p> <p>Jordan must therefore agree and include a vision that spans the period to 2050. This can also include reference to interim dates.</p>
Detail adaptation and/or climate resilience visions/goals	<p>The LTS vision should ensure it is “mindful of Article 2 taking into account [countries] common but differentiated responsibilities and respective capabilities” and address adaptation in development planning. Adaptation is an important issue for Jordan (“the imperative track” according to the Climate Change Policy) and should therefore be a priority to integrate into the LTS vision. This also will allow for consideration of synergies between mitigation and adaptation. The LTS vision could go further and be explicit about the balance between mitigation, adaptation and other development priorities, clearly laying out the approach the country wishes to take on climate change, recognising country circumstances. For example, referencing adaptation as “the imperative track”.</p> <p>Jordan could also make clear the country’s vulnerability to climate change and priority to adapt in the vision, with mitigation framed as a co-benefit of adaptation and sustainable development. It could outline the most important adaptation options that address the most important climate vulnerabilities and potential impacts and risks, and quantify likely reductions in greenhouse gas emissions (see below) insofar as they are compatible with these options.</p>
Alignment with recent and current strategies	<p>The vision statement would benefit from contextualising to existing national strategies, such as referencing how it aligns with the visions, objectives and goals of recent and current strategies that are of national importance to Jordan.</p> <p>Jordan could state whether, for example:</p> <ul style="list-style-type: none"> • The LTS builds upon or links to Jordan’s NDC • The LTS builds on “Jordan 2025” (or updates to this) • The LTS provides synergies with other development goals and policy areas (e.g. gender) which could be explicitly referenced – for example referencing the SDGs
International context	<p>The vision statement can also contextualise the international importance of the strategy to the UNFCCC. Not many countries have yet put forward an LTS, so the vision is recommended to explicitly reference the LTS’ position as a report for the UNFCCC for clarity. Additional information on Jordan’s fulfilment of reporting obligations under the UNFCCC can also be included if desired.</p> <p>Jordan is therefore recommended to include a sentence to acknowledge that the LTS is submitted consistent with Article 4, paragraph 19 of the Paris Agreement.</p>
Quantified target	<p>As shown in the international review, countries so far have predominantly committed to a net zero or carbon neutrality goal by 2050. Although there is wide recognition that the LTS should focus on national priorities, and some countries are taking an ‘adaptation first’ approach, an LTS is nonetheless intended to provide details of the country’s low greenhouse gas emission development. Some countries such as South Africa alternatively detail the trajectory (e.g. target peak year) to be followed.</p> <p>Whilst taking into account Jordan’s wish to prioritise adaptation, the LTS should also state a 2050 mitigation goal and ideally, the scope, such as which GHGs and sectors (e.g. economy wide) the target will cover. For example, the (currently</p>

	proposed) commitment to a carbon neutrality goal in the updated Climate Change Policy should be referenced.
Interim targets	<p>The LTS vision can also note interim targets (e.g. reduction of 40% by 2030, reflecting sub-national commitments. Or targets for every 5-10 years etc.) that will keep the country on track for the 2050 target. This will also be important for alignment with, for example, the NDC and future updates to this.</p> <p>Jordan can consider referencing its NDC as an interim target, or the sub-national commitments of 40% by 2030, and updated Climate Change Policy if this contains interim targets. However, the current NDC target is likely to not be ambitious enough to align with a mitigation pathway to deliver a net zero 2050 goal, and this will need to be addressed through stakeholder consultation processes, modelling and analysis of mitigation potential etc. Given that Jordan is likely to prioritise adaptation however, interim mitigation targets may be less relevant to specify within the LTS vision.</p>

4.4 Information to develop Jordan’s long-term vision



It is important that the vision for the LTS is consistent with the long-term climate and development goals contained within existing Jordanian national report and strategies i.e. that the LTS aligns with Jordan’s development goals. Therefore, a review has been carried out of the key national and sub-national plans and strategies in Jordan in order to support this. In total, this review considered 22 existing long-term plans and strategies identified as having visions (or goals/objectives) that would be relevant to the LTS. This includes national plans/strategies, but also sectoral plans, and also plans prepared at sub-national level. The summary findings of this review are provided below in Table 4-3.

See Annex 2 for more detailed review and analysis of Jordan’s strategies

Table 4-3: A summary of some of Jordan's existing visions/goals/objectives that should be taken into account in the framing of the vision. See relevant documents for full details and more objectives.

Sector	Key Visions / Goals / Objectives	Relevant Documents
Mitigation	<p>INDC target: 14% GHG reduction (1.5% unconditional / 12.5% conditional)</p> <p>Local SE-CAP targets: Greater Irbid has committed to reduce emissions by at least 40 % below 2015 levels by 2030 (conditional). Aqaba and Karak have also adopted this 40% target, but as a secondary scenario.</p> <p>Amman has committed to net zero emissions by 2050 in the ‘Amman Climate Plan’</p> <p>The National Energy Strategy 2020 – 2030 aims to reduce CO₂ emissions by 10% by 2030.</p>	<p>NDC</p> <p>Local SE-CAPs</p> <p>The Amman Climate Plan</p> <p>National Energy Sector Strategy 2030</p>
Adaptation	<p>Climate Change Policy 2013-2020:</p> <ul style="list-style-type: none"> • To build the adaptive capacity of communities and institutions in Jordan, with consideration for gender and addressing the needs of vulnerable groups, to increase the resilience of natural ecosystems and water as well as agricultural resources to climate change, and to optimize mitigation opportunities <p>NAP: Key areas to be targeted in adaptation efforts:</p> <ul style="list-style-type: none"> • Water Sector: • Agriculture sector • Urban sector • Socioeconomic • Ecosystems and biodiversity • Health 	<p>NC3</p> <p>Climate Change Policy 2013-2020</p> <p>National Adaptation Plan</p> <p>Prioritised List of NDC Actions</p> <p>Technology Needs Assessment</p>

<p>Energy Sector</p>	<p>National Energy Sector Strategy:</p> <ul style="list-style-type: none"> To increase self-sufficiency through utilization of domestic natural and renewable resources, as well as expansion of existing energy developments thus reducing reliance on costly foreign fuel imports that burden its economy To improve energy efficiency in all sectors by 9% by 2030 <p>Energy Sector GG-NAP:</p> <ul style="list-style-type: none"> To decrease use of fossil fuels and decrease reliance on fossil fuel imports Enhance innovation and technical capacities in the energy sector. 	<p>National Energy Sector Strategy 2020-2030</p> <p>Energy Sector GG-NAP</p> <p>OECD clean energy?</p>
<p>Transport Sector</p>	<p>Long-Term National Transport Strategy:</p> <ul style="list-style-type: none"> MoT vision is to have a developed and sustainable transport sector, distinguished for competency, safety and environmental stability, enhancing the socio-economic development and making Jordan a regional hub for transport <p>Transport Sector GG-NAP:</p> <ul style="list-style-type: none"> Increase access to reliable, affordable, and safe public transport services for all, including women, youth, and rural communities; Promote the use of electric and hybrid vehicles through strengthened regulations and incentives; Promote non-motorized transport modes and provide necessary infrastructure Reduce GHG emissions (CO₂) from the transport sector; Promote the use of climate-resilient infrastructure in transport sector investment planning Increase public funding and private investment in the transport sector 	<p>Long-term National Transport Strategy</p> <p>Transport Sector GG-NAP</p>
<p>Agriculture Sector</p>	<p>National Agricultural Development Plan:</p> <ul style="list-style-type: none"> To digitize and restructuring the sector, and boost its productivity Increase the forest area by 10% by 2025 and expand pasture areas Increase the number of farmers using digital government-run agricultural services by 30% Increase the productivity of food and agricultural manufacturers by 18% by 2025 <p>Agriculture Sector GG-NAP:</p> <ul style="list-style-type: none"> Improve the skills and capacity of farmers, rural communities, youth and women to undertake sustainable agriculture; Increase use of resource efficient technology to reduce consumption and cost of water, energy, and waste management on farms and in agro-processing. Increase use of high-yield, drought and salinity-resistant plant varieties; Develop and implement policy and fiscal tools that encourage the take-up of adaptive techniques and technologies Introduce the concept of climate smart agriculture on farms; Increase carbon sequestration capacity of Jordan's land and forest. 	<p>National Agricultural Development Plan 2020-2025</p> <p>Agriculture Sector GG-NAP</p>
<p>Industrial Sector</p>	<p>JEGP:</p> <ul style="list-style-type: none"> Expanding the industrial manufacturing base, increasing available production capacity, enhancing the competitiveness of service sectors, providing an enabling business environment and creating job opportunities for Jordanians; all through building concrete and effective partnerships with the private sector. <p>Prioritised NDC mitigation actions for the industrial sector:</p> <ul style="list-style-type: none"> Low-carbon technology R&D Incentives for Low-carbon industries Promote EE and RE 	<p>Jordan Economic Growth Plan (JEGP)</p> <p>Prioritised NDC Actions (Mitigation)</p>

<p>Waste Sector</p>	<p>National Municipal Solid Waste Management Strategy</p> <ul style="list-style-type: none"> Expansion of MSW recycling and separation schemes Construction of mechanical and/or biological treatment facilities, and other sophisticated material recovery systems <p>Decentralized Wastewater Management Policy</p> <ul style="list-style-type: none"> Establishing a decentralized wastewater management approach Expand wastewater management by implementing the practice of recycling and reusing water beyond the existing conventional wastewater service system <p>Water Substitution and Re-Use Policy</p> <ul style="list-style-type: none"> More efficient use of water resources through reusing treated wastewater in irrigation that enables freeing fresh water for municipal uses. <p>Waste Sector GG-NAP</p> <ul style="list-style-type: none"> Reduce greenhouse gas emissions from landfills and dumpsites, particularly methane gas resulting from decomposed organic matter. Improve the resilience of waste management and treatment infrastructure to climate-related disasters (such as floods). Promote inclusive innovation in technology and processes to leverage waste-to-resource and waste-to-energy potential. Increase the amount of waste diverted from landfills toward recycling and re-use 	<p>National Municipal Solid Waste Management Strategy 2015-2034</p> <p>Decentralized Wastewater Management Policy 2016</p> <p>Water Substitution and Re-Use Policy 2016</p> <p>Waste Sector GG-NAP</p>
<p>Water Sector</p>	<p>National Water Strategy</p> <ul style="list-style-type: none"> The long-term goal is to achieve water security in the country Proactive and preventive water adaptation approaches in protecting the limited water resources with emphasis in drinking water resources and upgrading drinking water quality management system and surveillance programs. Preparedness and response for natural disasters such as severe weather, flooding and extreme temperatures, and external and internal conflicts <p>Water Sector GG-NAP</p> <ul style="list-style-type: none"> Augmenting water supply for priority economic activities through decentralized infrastructure solutions, such as rain water harvesting (RWH) or reclaimed wastewater; Introducing demand management measures such as efficiency improvements, loss reduction, water reallocation, and incentive structures to save/conservate water; Ensuring equitable, reliable, and affordable access to clean water and sanitation services for all; Building resilience to climate-change related water challenges among vulnerable groups; Increasing water-use efficiency across all sectors including agriculture, industries, and municipal sectors; Reducing water losses and leakages in municipal water services and in conveyance systems to improve their efficiency in delivery; Increasing the quantity of water and wastewater treated for further recycling and reuse. Improve drought resilience by expanding decentralized supply and introducing demand management measures across sectors; Improve flood resilience through flood risk management measures, through appropriate flood mitigation infrastructure and measures to respond effectively to floods; Reducing GHG emissions in the water sector through use of RE and EE in water production and distribution systems. 	<p>National Water Strategy 2016-2025</p> <p>Water for Life 2008-2022</p> <p>Water Sector GG-NAP</p>
<p>Buildings sector</p>	<p>The Amman Climate Plan</p>	<p>The Amman Climate Plan</p>

<p>Tourism</p>	<ul style="list-style-type: none"> Improving energy efficiency in all GAM- controlled municipal buildings and public lighting to show leadership and demonstrate cost effectiveness. Improving enforcement of existing building codes. Incentivizing best practices for new construction of commercial and residential green buildings. Partnering with the national government and international organizations to implement energy efficient programs for existing residential buildings <p>Jordan Green Building Council⁷¹</p> <ul style="list-style-type: none"> Vision: A healthy, sustainable and resource efficient environment that is affordable and available to all individuals and local communities⁷². Green buildings are viewed as the cornerstone of sustainable development since the construction sector is central to economic development and employment. Green buildings provide a set of added benefits in terms of water and energy saving. The construction sector has the potential for water and energy saving which will contribute to environmental sustainability. <p>Tourism Sector GG-NAP:</p> <ul style="list-style-type: none"> Increase public awareness about the value of natural resources and the environment through tourism sector activities; Strengthen availability of data around environmental issues and mainstream the environment into the tourism sector’s development planning and management; Reduce the negative impacts of the tourism sector on the natural environment (including biodiversity and at natural heritage sites); Improve the attractiveness of tourism in Jordan to investors and tourists (foreign and domestic); Increase the overall return on tourism sector investments by increasing the quantity and quality of tourism products and services, and enhance innovation in service provision Develop green job opportunities in the tourism sector for all, especially women and youth; Enhance the resilience of critical infrastructure in key tourism areas to natural hazards and climate-related risks; Increase the resilience of the tourism sector 	<p>The Green Building Guideline and national building codes</p> <p>Tourism Sector GG-NAP</p>
<p>Economy</p>	<p>National Green Growth Plan (NGGP):</p> <ul style="list-style-type: none"> A clear vision for Jordan as a country with an expanding and sustainable economy that creates jobs, income for its citizens, and is resilient to external shocks and instability in the region. A country of economic opportunity for everyone that provides decent work and living conditions based on an environmentally sustainable economic growth model <p>Jordan 2025: The most important goals that the vision seeks to achieve include:</p> <ul style="list-style-type: none"> Economic growth, fiscal stability, reduction of financial waste and public debt to safe levels. Foreign investment by enhancing and increasing business and investment competitiveness. Development of economic sectors through market creativity and honing the tools and means of high-value-added export-oriented sectors. Encouragement of small and medium-sized businesses. Enhancement of the policies governing the labour market. 	<p>NGGP</p> <p>Jordan 2025</p> <p>Jordan Economic Growth Plan</p> <p>Jordan Economic Monitor</p>

⁷¹ UNDP and the National Green Building Council announced the desire to develop building codes that consider climate change, but these have not started yet. Existing green building codes are not yet enforced.

⁷² Only available online, via <https://www.jordanewe.com/about-sector/jordan-green-building-council-gbc>

<p>Gender and Inclusivity</p> 	<p>To identify and develop gender-sensitive strategies to respond to the environmental and humanitarian crises caused by climate change</p> <p>The national vision is of increasing women’s economic participation to 24%.</p> <p>Key SDGs: SDG5 (Gender Equality)</p> <p>Key goals from Jordan 2025:</p> <ul style="list-style-type: none"> • An increment of women’s participation in the labour market. • Giving necessary attention to people with special needs. <p>Gender mainstreaming is a key objective of the Local Climate Actions Plans of Deir Alla, Busaira and Ayoun municipalities</p> <p>The common overarching goal on gender equality is related to ensuring women have access to, participate in, contribute to and benefit from climate change initiatives, programs, policies and funds in addition to enhancing women’s economic participation.</p>	<p>Jordan 2025</p> <p>SDG Review</p> <p>Rural Women and Climate Change in Jordan</p> <p>Local CAPs</p> <p>Cross-cutting</p>
<p>COVID-19 Response</p>	<p>The primary vision for Jordan’s COVID 19 response is to Build Back Better (BBB)</p>	<p>The Impact of the COVID-19 Pandemic on Enterprises in Jordan</p> <p>Jordan Food Security Update: Implications of COVID-19’</p>

4.4.1 Conclusions from key strategies to inform the vision

Jordan 2025 is a key document to consider currently in the framing of the LTS and its vision, as the main strategic and forward-planning document for the country. The assumptions and goals of this plan should be one starting point – together with climate objectives – for the framing of a long-term vision and the quantitative analysis that will support the pathway development (for example, growth assumptions). The draft Executive Program for 2021-2025 currently in development should be the main reference for the LTS vision, once updated. It is recommended to work closely with MoPIC to ensure that the LTS and future updates to the strategy are aligned. There is also an opportunity to approach MoPIC to explicitly include climate change in the Executive Program, or subsequent updates of this, which will build on the vision. As neither Jordan 2025 or the Executive Program go beyond 2025, there is an opportunity for the LTS and the vision within in, to support MoPIC’s development of future updates in the longer term and ensure that both the LTS and future Jordan vision strategies follow pathways that align.

The Climate Change Policy and the Draft NAP are both key documents for the framing of climate-specific goals and visions. However, the former is currently being updated and the latter is yet to be finalised and published, and so there may be expected the be some changes. It will be important to ensure the latest versions and any updates are included in the framing of the vision.

The First Voluntary National SDGs Review is not in itself a high priority document, but SDGs in general are key in the governmental planning process⁷³ and so the review findings are critical to take into account in the LTS vision. Although not explicitly a ‘vision’ or goal, the statement highlighted above is often repeated by stakeholders and summarises the country’s ambitions in relation to the SDGs.

The National Green Growth Plan is not in itself a specific ‘climate’ strategy, is short term and does not include targets for climate change, but it does have traction in ministries and is considered an important guide for decision-making, in particular on implementing actions. The vision of this strategy may therefore be important for the LTS, give it will resonate with stakeholders and allow for

⁷³ MoPIC stakeholder

connections to be made between these two areas of activity. The GG-NAPs are also structured by key sector, and these sectors are likely to reflect preferences for future sectoral structures.

The COVID-19 pandemic has exacerbated ongoing social, economic and equity challenges, but presents an opportunity to 'Build Back Better' and connect a long term vision of resilience, low emissions, socioeconomic development, equality of opportunity (with a focus on women, youth, vulnerable and marginalised groups), with economic recovery through 'green' industries and development.

The common overarching goal on gender equality is related to ensuring women have access to, participate in, contribute to and benefit from climate change initiatives, programs, policies and funds in addition to enhancing women's economic participation.

4.4.2 Conclusions from sector strategies

Jordan's National Energy Sector Strategy for 2020-2030 is a very important strategy for guiding future development of the sector and therefore emissions, significant given the large share of total GHGs from energy in Jordan. It will be critical for framing the energy (and emissions) transition pathways for Jordan, at least to 2030. It indicates that the country's vision is for greater energy diversification and local renewable energy development, but with no reduction in the share of electricity met by oil shale (high emissions intensity). This would likely not be consistent with long term decarbonisation pathways and so Jordan will likely need to review the post-2030 energy pathway and consider 'steeper decline' scenarios. This strategy is also the most recent mitigation target to be set – a 10% reduction on BAU by 2030 from the energy sector. However, this reduction target is significantly below the level of ambition most countries are targeting in medium and long-term plans. Jordan therefore needs to consider whether there is scope for increasing this target through, for example, further increasing the renewable energy share.

The Jordan Long-term National Transport Strategy includes aspiration of low carbon technologies under the pillar '*Protect the environment and reduce negative impacts*' and well reflects the need to include citizens and societal benefits also. It does not include specific goals or targets for climate change or low carbon transport modes, and also includes some actions that might be deemed conflicting if not incorporating low carbon technologies (i.e. road building to encourage road transport, would need to prioritise electric and low emission vehicles).

The Jordan National Water Strategy and the 2020-2025 National Agricultural Development Strategy are the most important for climate adaptation. Water energy efficiency is also a theme in the Energy Strategy, so it has relevance to mitigation also. Water and Agriculture are both key sectors in the NDC and the Draft NAP and so it will be important to integrate sector goals. In particular, both focus not only on improved resilience and resource management, but also growth as a sector, new technologies for improved and more efficient management, digitalization, job creation and export potential (for agriculture). The Agriculture strategy includes few direct references to climate change however.

Lastly, Health has been an increasingly important sector, as evidenced by the COVID-19 pandemic, and so the National Climate Change Health Adaptation Strategy and Action Plan of Jordan (2013-2017), whilst not yet targeted for an update, may become important. In particular, reflecting on the linkages between health, disease, future climate trends, shocks, and the need for resilience. The strategy notes that "*Improving health systems is a clear "no-regrets" option for adaptation*". This also links to strategies such as the Jordan Response Plan (2020-2022), which whilst also not intended to be updated at present, sets out a pioneering model on humanitarian crisis response and shows Jordan's enduring commitment to continue to build an integrated multi-year framework to most effectively respond to Syria crisis in a transparent, collaborative and sustainable manner in line with the Global Compact on Refugees and the 2030 Agenda.

4.4.3 Visions and strategies not included in this review that should be considered in the LTS vision development

There are a number of activities underway in parallel in the country, which have not been possible to incorporate at this point. These are summarised in the table below. The LTS vision development

process should ensure that it checks the status and incorporates/builds on these as the work commences. Of particular importance is the Executive Development Programme (Vision 2025), and the updated Climate Change Policy.

Table 4-4: Forthcoming activities and documents important for review and inclusion in the LTS that have not been possible in this project

Document / strategy / activity to additionally include	Relevance
BUR2	The BUR2 will update the mitigation projections and modelling for Jordan and also update the GHG inventory, so will be the most recent baseline
Covid-19 recovery plans / Economic recovery plan (World Bank)	This will present the opportunities and strategy for economic recovery from COVID-19 and 'Build Back Better'. It is hoped this will reflect a 'green recovery' but the plans and vision of this will be important to factor into the LTS, at least in the short term
Updated climate change policy (UNDP)	This policy is critical to include as it is re-setting a long-term mitigation commitment and direction for the country and will provide strategic guidance in, potentially the longer term, which will directly inform the LTS development
NAP (final published)	The NAP draft has been included in this review but is not yet formally published. Any changes will need to be considered in the LTS
Updated NDC	The updated NDC will put forward prioritized actions and the short term (2030) mitigation target. This should represent an 'interim target' for the LTS and ideally the NDC and LTS would align to support an ambitious long-term pathway.
Executive Development Program (MoPIC)	This is the most important strategic document for Jordan
National environmental programme 2020-2030 (GIZ)	Unclear what the scope of this programme will be but it should be included in the LTS development when available

4.5 Recommendations for the LTS vision



4.5.1 Suggested themes as a basis for Jordan's vision

From the review of existing climate, development-related and sectoral visions/goals in Jordan, a number of themes can be identified that could form the basis of Jordan's LTS vision. These are further explained in **Annex 2**. These are recommendations only drawn from existing strategies, and it is recommended that these are reviewed, amended and consulted upon and re-defined as needed in forming the overarching LTS vision for Jordan.

- 1. Climate resilient, low carbon, healthy, inclusive, and sustainable communities and institutions, that ensure opportunities are evenly distributed**
- 2. A country with an environmentally sustainable economic growth model resilient to external shocks and instability – pro-actively delivering prosperity, improved quality of life and jobs for all citizens, particularly youth, women and vulnerable groups**

- 3. A society that is inclusive, considers youth and gender, delivers improved quality of life for vulnerable groups, and ensures no one is left behind**
- 4. Sustainable, self-sufficient and efficient energy and transport sectors, meeting needs through high levels of deployment of local renewables and low carbon technologies**
- 5. Sustainably managed natural and agricultural resources, and thriving and productive ecosystems, to enhance climate resilience**
- 6. A country with a focus on participatory policy making, fiscal sustainability and strong institutions, with decision-making based equally on social, economic and environmental goals**
- 7. Liveable and sustainable towns and cities that are clean, modern, safe, environmentally-conscious, and work efficiently, to promote their heritage and preserve resources for future generations**

4.5.2 Example summary vision

The above themes have been consolidated into four principles and one proposed vision statement for Jordan's LTS – shown in Figure 4-2 below. Note that this is an example only and is in way intended to be prescriptive:

- Leave no one behind and ensure a high quality of life for all
- High resilience to climate impacts and future shocks
- Low carbon, sustainable and efficient
- Sustainable economic growth and prosperity, and opportunities for all

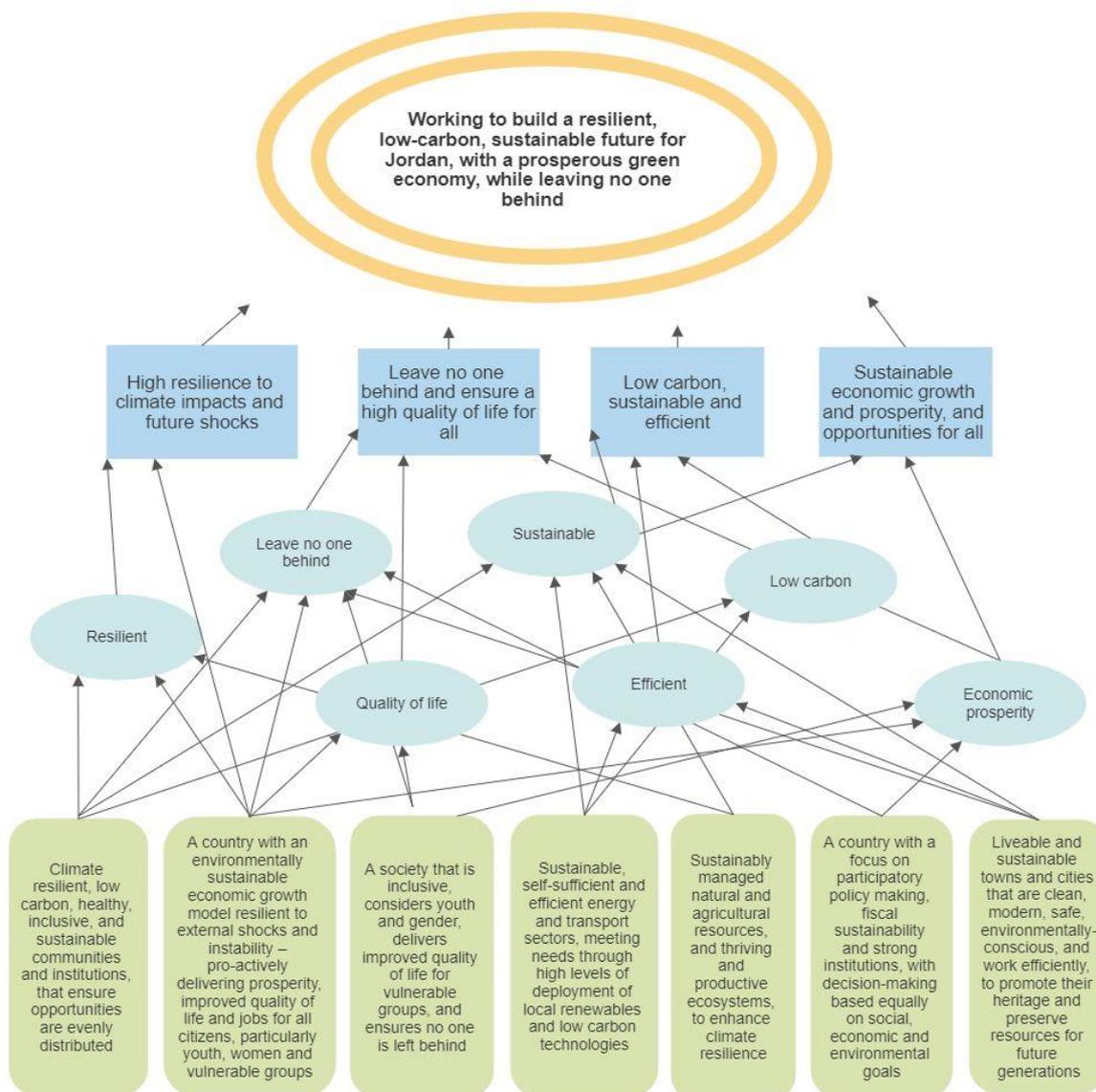


Figure 4-2: Jordan’s potential long-term strategy vision

Source: Developed by Ricardo Energy and Environment

4.5.3 Example of a suggested vision statement

The Vision Statement can be accompanied by a Foreword and Executive Summary within the opening introduction of the Jordan LTS. These additional sections can go into other areas of detail to the Vision, such as any sectoral goals, recent historic landscape of action on climate change in Jordan, reasons behind Jordan’s development of the LTS, and a summary of the LTS development process to provide additional context.

Including a memorable phrase or saying in Arabic in the Foreword or Executive Summary can also help with making the strategy more memorable to the reader, more approachable to the layperson, and unify the report around a simple concept. For example:

Working to build a resilient, low-carbon, sustainable future for Jordan, with a prosperous green economy, while leaving no one behind

العمل معا لبناء مستقبل مستدام، منخفض الكربون، ومرن قادر على الصمود في ظل التغيرات المناخية مع ضمان اقتصاد مزدهر أخضر لا يستثنى أحداً

Based on the above suggested thematic structure, and the themes in existing visions that have been identified, the following is recommended: a vision statement that is concise, with a suggested length of between 350 to 650 words, between 5 to 7 paragraphs. An example is included below.

The wording of this Vision Statement is designed to convey an image of what the final Vision might look like, and serves as a draft version with which to edit as required:

Paragraph 1:

Working to build a resilient, low-carbon, sustainable future for Jordan, with a prosperous green economy, while leaving no one behind. Our pathway to 2050 is focussed on the need to adapt Jordan to the increasing risks from climate change whilst maximising the benefits of a transition to a cleaner and low carbon future. Throughout this transition, sustainable and inclusive development is central, including enhancing women's empowerment, opportunities for young people, supporting vulnerable communities, eradicating poverty, and promoting equality, justice and fairness [insert further sentence(s) as needed].

Paragraph 2:

Adaptation to climate change is imperative for Jordan. Our long-term adaptation goals are to build sustainable, climate-resilient communities, ensure sustainable water and agricultural resources, and thriving and productive ecosystems. This strategy will build Jordan's long-term resilience to the risks of climate change ... [insert further sentence(s) as needed, referring to the long-term risks associated with climate change in Jordan, what impacts this could lead to, and how the international importance of adaptation goals within country long-term strategies].

Paragraph 3:

Jordan also strives for decarbonisation whilst adapting to climate impacts and will aim to maximise the opportunities that decarbonisation will bring, including energy security and efficiency, new technologies, job creation, cleaner and healthier environments, and new economic opportunities. We aim to ensure that Jordan transitions to a lower carbon economy by mid-century and achieves net zero emissions before the end of the 21st Century. Jordan's long-term mitigation goals... [insert further sentence(s) as needed, referring to the long-term low-carbon GHG emissions pathway for Jordan]

Paragraph 4:

Jordan's LTS was developed in line with Article 4 of the Paris Agreement, whereby Parties to the United Nations Framework Convention on Climate Change (UNFCCC) "should strive to formulate and communicate long-term low greenhouse gas emission development strategies, mindful of Article 2 taking into account their common but differentiated responsibilities and respective capabilities, in the light of different national circumstances". In addition, the LTS also answers the urgent call issued by the recent Intergovernmental Panel on Climate Change (IPCC) Global Warming of 1.5°C, an IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global GHG emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. (insert further sentence(s) as needed)

Paragraph 5:

Jordan's LTS is designed to be a "living document", that serves to guide the country's long-term development whilst remaining adjustable to the national context. It aims to support the strengthening of institutional and human resources and capacities to achieve the objectives, engage civil society and provide a common vision for all. It also furthers the visions of other strategies of national significance, such as Jordan Vision 2025 (2013), Jordan's Climate Change Policy (2013-2020), National Adaptation Plan (draft), National Green Growth Plan, Jordan's first Nationally Determined Contribution (NDC) (2015), local government climate action plans and national sectoral strategies... [insert further sentence(s) as needed.



4.5.4 Steps for creating the vision

The development of the LTS vision can happen in a variety of ways. On the one hand, the vision needs to be inspirational and set out the principles that will achieve the desired resilient low-emissions future and so could be developed 'top down'. On the other hand, the vision needs to also be grounded in the reality of the country, be informed by and respond to needs and priorities of citizens and stakeholders. In this sense, the vision could be developed 'bottom up'. Whilst the vision should not solely be the product of analysis, it is often informed by it and should be participatory so it is likely that the development of the vision would be iterative. For instance, utilising consultations with stakeholder and citizens to define priorities, or 'testing' a vision statement via consultation and analysis before refining it further, reviewing potential mitigation and adaptation pathways to ensure achievability of potential goals and targets.

It is therefore recommended that Jordan undertake the following steps to define the LTS vision, drawing on the above. Note that these are likely to need to be iterative:

- **Review existing visions, strategies and development priorities in the country:** Through analysis undertaken in this work and through further review and consolidation of sectoral and country-level strategies (particularly any subsequent updates), existing overarching goals and objectives for the country and the *principles for the vision* could be defined. For example, on fairness and justice, sustainable development, gender, youth and equality etc. During the process of refining the vision or in subsequent iterations, there will need to be both integration of the vision into relevant strategies (including at sectoral level) and consideration of any updates of key strategies (e.g. the Executive Development Program of Jordan Vision 2025). The themes above can be used as a starting point for this and as the basis for consultation.
 - e.g. National Green Growth Plan (NGGP): A clear vision for Jordan as a country with an expanding and sustainable economy that creates jobs, income for its citizens, and is resilient to external shocks and instability in the region. A country of economic opportunity for everyone that provides decent work and living conditions based on an environmentally sustainable economic growth model
 - e.g. Jordan 2025: To identify and develop gender-sensitive strategies to respond to the environmental and humanitarian crises caused by climate change
 - e.g. Key SDGs: SDG5 (Gender Equality)
- **Agreement on the scientific consensus regarding international commitments and actions – defining a mitigation commitment:** The scientific consensus on the need for global deep decarbonisation is clear. Jordan should consider its level of commitment for 2050 and consider adopting, at least in principle, a decarbonisation goal (which could be carbon neutrality / net zero emissions by a certain year). This will need to be tested with stakeholders, particularly Ministers and political groups, and key stakeholders, in order to sensitise and build engagement. Key to this will be building capacity on climate issues and articulating the benefits of an LTS and adoption of such goals.
 - e.g. INDC target: 14% GHG reduction (1.5% unconditional / 12.5% conditional)
 - Amman Climate Plan: 99.5% reduction by 2050
 - Climate Change Policy (update) is expected to propose net zero by 2050
 - Sub-national CAPs/SE-CAPs target 40% reductions in emissions by 2030

See sections 77 and Error!
Reference source not found. Error!
Reference source not found. **on engagement processes, and section 66 on institutional and governance arrangements for more information on processes**

- Agreement on climate adaptation and sustainable development priorities:** Alongside this, defining the adaptation priorities and needs, and sustainable development objectives, should also be undertaken to ensure the vision is inclusive of all priorities. These should also be tested with stakeholders, particularly Ministers and political groups. Key to both will be *building the linkages and co-benefits between climate adaptation, development and mitigation* to create a compelling vision.
- Citizen and stakeholder engagement to ensure inclusivity and consensus:** Seeking citizen and stakeholder input to shape the vision can be highly effective and can come at a number of different stages in the process (and are not mutually exclusive). This might include gathering initial ideas on priorities and goals across the country to define the principles of the vision; seeking feedback on specific elements of the vision (or the pathways to achieve them), including in different sectors or on different technology options; building capacity on climate through consultation on options to create buy-in and increase awareness; and testing final vision statements with stakeholder groups. Again, the themes above could provide a starting point for this consultation.
- Defining scenario and pathways:** Lastly, there are important technical steps required in the finalisation of the vision through the development and refinement of the pathways to achieve the goal. There might be multiple pathways based on different technology options and assumptions, and these should be tested with stakeholders. However detailed modelling is not required for developing the vision, other than having a good understanding of long-term trends of population, expected growth, emissions and climate variables for example. This can be done with general equilibrium models. See [Annex 4](#) on Modelling approaches for further details on modelling.

e.g. NAP: To build the adaptive capacity of communities and institutions in Jordan, with consideration for gender and addressing the needs of vulnerable groups, to increase the resilience of natural ecosystems and water as well as agricultural resources to climate change, and to optimize mitigation opportunities

Figure 4-3 below provides a visual summary of how different activities might feed in to defining the final vision.

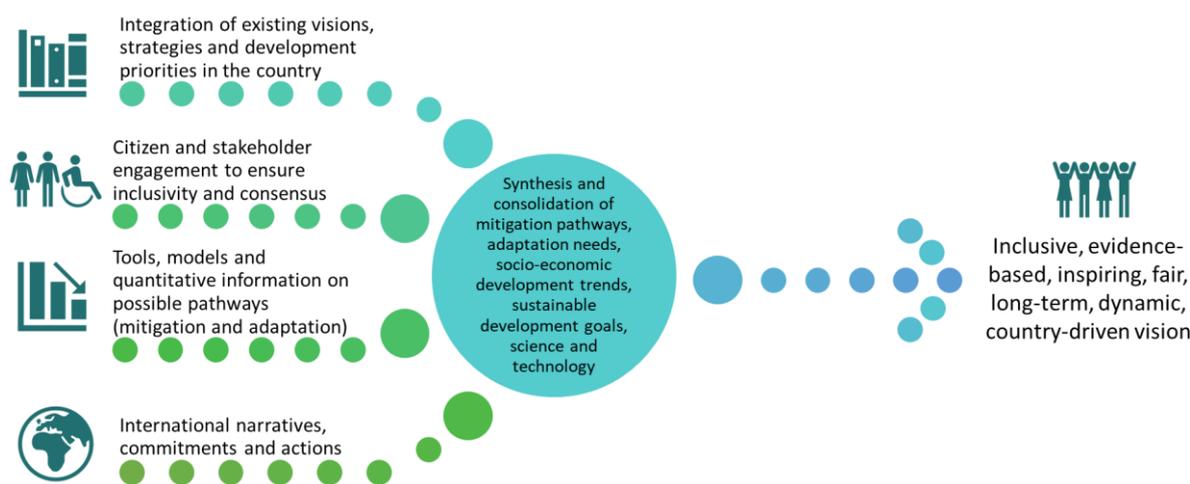


Figure 4-3: Creating the country vision

Source: Developed by Ricardo Energy and Environment

4.6 Challenges and bottlenecks to consider when developing the LTS



Table 4-5: Key challenges/bottlenecks related to Jordan's long-term vision, and potential solutions.

Key challenges/bottlenecks in Jordan	Potential solutions
The LTS vision both offers an opportunity to raise ambition, but will pose challenges in securing commitment to a target that is significantly more ambitious than previously committed to.	The timeframe of the LTS offers some flexibility to make such commitments, on the assumption of global shifts in technologies and society to achieve this as a collective.
A Net Zero 2050 goal is possible to propose for Jordan, but the LTS development process will need to carefully consider how this is managed and the country needs for such a commitment.	It will be important to frame the potential vs planning (what can Jordan achieve now, where should Jordan be aiming for and how to frame this in long term planning) and the tools needed to set this goal. Extensive awareness raising, building the knowledge and buy-in of decision-makers, addressing data challenges to back up a commitment, and finance will be needed.
There is 'no time for long term planning' and setting visions for 2050 is too challenging whilst Jordan is dealing with short term crises	Undertaking a longer-term planning process and vision-setting in an inclusive and participatory way, will help ensure that decisions made in the near term are consistent with those long term objectives. Whilst optimism and ambition are important however, for Jordan, basing planning on 'worst case scenarios' about what is possible might help to ensure the LTS provides a more realistic pathway to support better decision-making to short term crises. Differentiating short and long term, and key assumptions and support needs, will be important. The vision of the LTS can provide an opportunity to support recovery if undertaken in parallel. Identifying 'green' technologies, projects and investments that not only shift the pathway but deliver recovery objectives will provide win-wins.
Jordan's domestic priorities are more focussed on resilience and sustainable development than mitigation of climate change, which is less of a priority.	Mainstreaming development priorities into the LTS vision (e.g. jobs, gender and inclusivity, SDGs) provides an opportunity to 'bring everything together' in one overarching country strategy, and also make clear the benefits that can be realised through climate compatible development. This may help to better "market" ambitious climate goals to stakeholders and interest groups. This should be a priority in creating the vision, through ensuring parallel capacity building and awareness raising on the wider impacts of climate. Integrating mitigation and adaptation goals in one strategy and identifying mitigation actions that have adaptation benefits (and vice versa) also helps to ensure that win-wins can be maximised and trade-offs limited and so this should be made explicit in the vision.

5 Long term adaptation and mitigation strategy

Navigation

Regarding the “strategy” element of the LTS, this section provides:



- **Role of the strategy**
 - o A description of the role that this element plays in the LTS
- **International examples**
 - o Examples of how what this element contains in other LTSs
- **Framework for Jordan’s long-term adaptation and mitigation strategy: what should it include?**
 - o A framework or approach to how this element may be presented in Jordan’s LTS and what it might include.
- **Information to develop the long-term adaptation and mitigation strategy sections**
 - o Core information relevant to the content of this element for Jordan
- **Recommendations for adaptation and mitigation strategy sections**
 - o A summary of recommendations for developing this element in Jordan’s LTS.
- **Challenges and bottlenecks**
 - o Potential challenges and bottlenecks to consider when developing this section.

This section is supported by

- **Annex 3** that presents the outcome of the adaptation analysis, including the vulnerability and risk assessment and synthesis of climate scenarios
- **Annex 4** that contains technical guidance on mitigation pathways and modelling approaches

5.1 Role of the strategy



Beyond the long-term vision, the long-term adaptation and mitigation strategy is a core component of the LTS. The strategy can draw upon analytical work on both adaptation and mitigation to identify what is needed for the country to achieve its vision. This should be thought as **a mechanism to guide policy making**, comprising both the immediate actions (which may be constrained and determined by today’s challenges) and a framework to guide policy making (including NDCs and sector strategies) as the country moves forward, and which addresses uncertainties, changing assumptions and realities. By outlining a set of strategic priorities (or pillars), the actions required, and ensuring that linkages to developmental benefits and other national priorities are made clear, the strategy can provide the framework for how the country will achieve its vision.

As the LTS is *long-term* and *strategic*, it should not be focussed on implementation of certain actions, nor constrained by the present. Rather, by providing the framework by which sectoral strategies and interim climate plans can frame their activities in the short term, it can ensure consistency with a long term pathway to deliver the vision.

The main purpose of the strategy is therefore to:

- ✓ ensure that countries’ near-term actions are consistent with their ultimate goals - putting short-term actions into context.

- ✓ help governments to recognise climate-related risks, both from direct impacts, and from the low-carbon transition itself, which could sharply devalue high-carbon assets.
- ✓ enable countries to unlock new economic opportunities, innovate, and create the jobs of the future.

5.2 International examples



There are few examples of LTSs submitted to date, and the vast majority of those are highly mitigation-focussed plans. They are by their nature country-specific, and few present 'good' examples of how to develop an integrated LTS (i.e. one that is not just a long term decarbonisation plan but a strategic climate and development plan). Very few present a holistic, integrated or adaptation-first approach. Therefore, there are few examples and little guidance to draw upon. In these recommendations for Jordan we therefore draw upon the Ricardo team's knowledge and experience.

For Jordan, adaptation is a high priority and should be the focus of the LTS, with existing reports (e.g. Third National Communication) highlighting the country's high climate vulnerability. As well as helping to safeguard future development gains, consideration of adaptation alongside mitigation may also help identify synergies between the two and prevent the uptake of mitigation measures that result in maladaptation.

Some countries have integrated adaptation measures into the LTS, for example Fiji's LTS is often cited as an example of integration of adaptation, although the structure is still centred around mitigation sectors, with "Synergies between Adaptation and Mitigation Actions in this LEDS" included as a separate section under the chapter "climate change and resilience". Others have chosen to keep

Costa Rica's LTS is structured along **10 decarbonization axes** derived from the country's greenhouse gas emissions patterns and corresponding with the major emission sources. For each axis, the Plan suggests:

- a vision of transformation
- short-, medium- and long-term measures or activities
- policy packages that combine planning, institutional or regulatory measures, implementation, access to financing, citizen support and avoiding lock-in.

The Plan identifies eight cross-cutting strategies, including:

1. Comprehensive reform for the new institutionality of the bicentennial, which Costa Rica is celebrating in 2021
2. Green tax reform
3. Funding strategy and investment attraction
4. Digitalization and knowledge-based economic strategy
5. Just transition labour strategies
6. Inclusion, human rights and gender equality
7. Metric and open data systems to evaluate progress
8. Education and culture strategy

The Plan identifies five priorities for action, to be implemented immediately:

1. Triggering the transformation of public transport
2. Accelerating and scaling up transformation actions of the agricultural sector's higher emitting activities
3. Laying the foundations of the electrification of the economy in the transport and industrial sectors
4. Avoiding technological pathways in energy and transport that do not eliminate emissions
5. Starting the process of two cross-cutting reforms, a structural reform that will lay the foundations for a new sustainable consumption and production system, and a green tax reform that reduces the negative externalities that deteriorate natural capital.

Box 5-1: Costa Rica's climate strategy structure

adaptation strategies in a separate document (usually a National Adaptation Plan, or NAP) which is then referenced in the LTS (e.g. Costa Rica’s LTS). Costa Rica’s approach is outlined in Box 6 1.

5.3 Framework for Jordan’s long-term adaptation and mitigation strategy: what could it include?



Given the lack of international examples that present the LTS as a holistic and integrated climate strategy, in these recommendations for Jordan’s adaptation and mitigation strategy we draw upon the Ricardo team’s knowledge and experience, and research and insights from Jordan, to present a framework for the LTS.

This framework is intended as a guide, that both

- ✓ suggests a methodological approach to the development of the strategy, i.e. an approach to develop a structure, content and process
- ✓ provides suggestions for what the strategy might look like (i.e. a set of ‘pillars’) and a process for identifying and assessing actions (action criteria)

The intention is that the framework and recommendations put forward enables a country-specific response, meets the international objectives of an LTS, incorporates both adaptation and mitigation priorities and wider development goals, and could be a future example of ‘good practice’ that helps to address the knowledge gap in creating LTSs.

The components of the framework are summarised visually in Figure 5-1, and Table 5-1 below presents the key components for the development of the strategy.

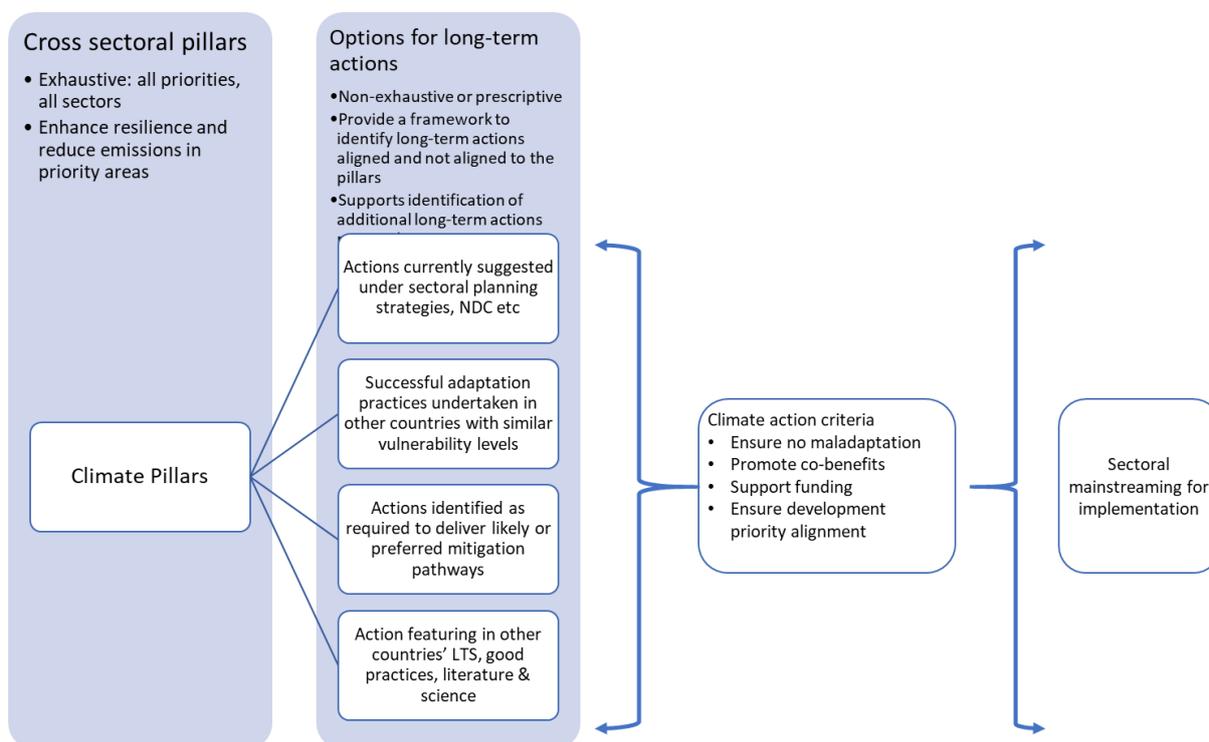


Figure 5-1: Key components proposed for the adaptation and mitigation strategy for the LTS

Source: Developed by Ricardo Energy and Environment

Table 5-1: Key components proposed for the adaptation and mitigation strategy

Key component	Description and recommendations
Pillars	<p>Although priorities are identified sectorally, solutions are often cross-sectoral, and their success is interdependent. Hence, instead of identifying a set of unique sectoral actions, we recommend that Jordan groups priorities together into a series of 'pillars'.</p> <p>These pillars should be exhaustive, encompassing all priorities, across all sectors, where action is required to achieve resilient low carbon development. Therefore, taken together the pillars provide a pathway for enhancing climate resilience and reducing emissions across the priority areas.</p> <p>Beyond national climate planning, the pillars also provide a framework for sectoral planning in short- and medium-term processes. By matching suggested sectoral actions to a pillar, decision-makers can easily identify whether an action will contribute or hinder resilient low-carbon development.</p>
Options for action	<p>Under each pillar, options for actions can then be identified to address the climate vulnerabilities, enhance resilience and prevent increases in GHG emissions. These can be identified based on:</p> <ul style="list-style-type: none"> • actions currently suggested under sectoral planning strategies • successful adaptation practices undertaken in other countries with similar vulnerability levels • actions identified as required to deliver likely or preferred mitigation pathways • actions featuring in other countries' LTS, good practices, literature & science <p>Due to the long-term nature of the LTS and the unavoidable uncertainty of climate models, decarbonisation pathways, technology and economic developments, it is recommended that options for actions suggested in the LTS are neither exhaustive nor prescriptive. Rather, they may provide a framework to:</p> <ol style="list-style-type: none"> 1. Identify which action currently planned is not in line with the pillars and hence, not conducive to resilient low-carbon development 2. Suggest additional actions that should be undertaken to achieve one or more of the pillars and hence, contribute to resilient low-carbon development
Climate action criteria	<p>To distinguish between different options for action under each pillar, to support the identification of co-benefits, allocation of funding, and to ensure alignment with other national development priorities, we recommend developing a set of criteria. It is recommended that these criteria apply to mitigation and adaptation actions equally, in order to ensure that:</p> <ul style="list-style-type: none"> • Mitigation actions that may lead to maladaptation or that do not bring any adaptation benefits are not prioritised • Climate actions that provide adaptation-mitigation co-benefits are highlighted • Climate actions that support Jordan's national development by providing economic, social and environmental benefits other than adaptation and mitigation (employment, competitiveness, social inclusion, gender and ecosystems) do not lead to maladaptation
Sectoral strategy integration	<p>The identified options for actions in the LTS will need to be taken forward in sectoral strategies for implementation. Mapping the identified options for action across sectors, the necessary linkages and mainstreaming opportunities can provide a transparent structure to support sectors to identify</p>

	the appropriate and relevant actions for each pillar and integrate these into policies.
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5.4 Information to develop the long-term adaptation and mitigation strategy sections



An overview of the adaptation and mitigation context is provided in sections 3.5.2 and 3.5.3. A detailed mitigation and adaptation analysis are provided in **Annex 3** and **Annex 4**.

5.5 Recommendations for the adaptation and mitigation strategy sections



5.5.1 Approach

An adaptation-first approach

While being one of the most vulnerable countries in the world, Jordan is also one of the lowest emitters. Its share of cumulative global carbon dioxide (CO₂) emissions since 1751 until 2019 is only 0.04%⁷⁴. Hence, long-term planning should prioritise reducing vulnerabilities and preventing any other actions from increasing vulnerabilities, as adaptation of all sectors is a precondition to long-term low-carbon development.

While it will be costly for countries around the world to adapt to future climate change, the cost of inaction may be even greater. Numerous studies have attempted to quantify the costs of CO₂ emissions, with a review of some of these studies⁷⁵ concluding that each tonne of carbon emitted could result in costs anywhere up to \$50. If we consider that global emissions in 2019⁷⁶ alone totalled 38 Gt (or 38 billion tonnes) of CO₂, it is clear to see that the total costs could be extreme. Another study by the Global Commission on Adaptation⁷⁷ suggests found that investing \$1.8 trillion globally in five areas (early warning systems, climate-resilient infrastructure, improved dryland agriculture, mangrove protection, and investments in making water resources more resilient) from 2020 to 2030 could generate \$7.1 trillion in total net benefits. Furthermore, the five areas covered represent only a portion of the total investments needed and total benefits available.

Jordan itself has already experienced how significant the costs of climate disasters can be, with severe floods in 2019 in the capital of Amman resulting in compensation for damages totalling JD 3 million⁷⁸. Unless consideration of such climate risks (and how they may increase in the future) is integrated into planning processes in Jordan, this extent of damage will persist or even increase.

Gender integration

At the 25th Conference of the Parties (COP) event in 2019 the Enhanced Lima work programme on gender (LWPG) and its gender action plan (GAP) acknowledged the need for gender mainstreaming through all relevant targets and goals, noting that gender-responsive implementation of climate policy and action can raise ambition, enhance gender equality, and promote a just transition of the workforce. Integrating gender equality into development leads to better outcomes in terms of economic efficiency, productivity and policy choices. Gender responsive solutions can help to tackle poverty and inequality

⁷⁴ Global Carbon Project. (2020). Supplemental data of Global Carbon Budget 2020 (Version 1.0) [Data set]. Global Carbon Project. <https://doi.org/10.18160/gcp-2020>

⁷⁵ Tol, R.S.J. (2005), "The marginal damage costs of carbon dioxide emissions: an assessment of the uncertainties", *Energy Policy*, 33(16), pp.2064-2074.

⁷⁶ EU (2020), "Global CO₂ emissions continue to rise but EU bucks global trend":

<https://ec.europa.eu/jrc/en/news/global-co2-emissions-continue-rise-eu-bucks-global-trend>

⁷⁷ Global Commission of Adaptation (2019), "Adapt Now: A Global Call for Leadership on Climate Resilience":

<https://www.wri.org/news/2019/09/release-global-leaders-call-urgent-action-climate-adaptation-commission-finds>

⁷⁸ The Jordan Times (2020), "Over 100 Amman shops claim damage after recent flooding":

<https://www.jordantimes.com/news/local/over-100-amman-shops-claim-damage-after-recent-flooding>

while providing better community representation and technical solutions. Consideration of gender issues provides a critical basis for understanding differential vulnerability to climate change and addressing the underlying causes.

5.5.2 List of pillars

Based on the detailed adaptation and mitigation assessment, this roadmap has identified a **set of 15 pillars for Jordan's LTS**. These pillars are **recommendations** and are intended to be indicative, acting as a guide, to the development of pillars or priorities under the approach suggested in this roadmap.



These pillars aim to guide future decision making to ensure that Jordan's development contributes to achieving or ensures that it does not prevent a low-carbon resilient future by 2050. The pillars and their links to mitigation and adaptation are presented in Table 5-2. The suggested pillars also aim to be consistent with Jordan's national development aims and strategies.

These pillars are intended to be exhaustive, in that they cover all of the key adaptation, mitigation and development needs and priorities for a country such as Jordan. However, they are **not intended to be prescriptive**. Jordan can use the pillars provided in this roadmap as a basis for consultation, and as a starting point for LTS development.

Furthermore, as the pillars here (or subsequently developed) are intended to be 'exhaustive', to cover all the necessary elements for a low carbon, resilient and inclusive transition to 2050, they are also assumed to *all* be necessary and important. In climate and development terms, to achieve a low carbon and resilient future requires doing everything, and not favouring one pillar over another at the level of the strategy. It is the actions under the pillars that can be assessed, prioritised and implemented by different policies, sectors and stakeholders in different ways and over different time periods. Box 5-2 explains more about prioritisation.

Box 5-2 Prioritisation of the pillars

'Prioritisation' is a common question and important as part of policy-making processes. It is not possible to do everything now, and so prioritising what comes first is important to ensure goals are met. However, the framework for the LTS climate strategy presented here recommends that **pillars should not be prioritised** for the following reasons.

1. All pillars are critical to ensure that the Vision is achieved
2. Pillars do not only prompt new climate actions and plans but also guide other actions that stem from different priorities across sectors (non-climate related)

Taken together, pillars should provide one exhaustive, non-mutually exclusive path to achieving the Vision, through:

1. Incentivising the definition of *new* short- and medium-term climate plans (nationally, locally and within sectors) so that the objectives of the Vision are achieved
2. Providing framework to ensure that *other* plans' actions and priorities that do not stem from the LTS are not contradictory but rather conducive to achieving the Vision

A prioritisation process can however take place when defining the long-, medium- and short-term **actions** that have been prompted by the LTS to achieve the Vision. Prioritisation here is useful and important in order to best maximise costs and benefits, respond to immediate needs and priorities, and account of timing/phasing of activities.

A framework for the **prioritisation of actions** is described in Section 5.5.4.

Table 5-2 Suggested pillars for Jordan's long-term adaptation and mitigation strategy

	Pillar	Rationale	Contributes to mitigation	Contributes to adaptation		
			Reduces emissions	Decreases climate sensitivity	Increases adaptive capacity	Reduces exposure
1	Enhancing sustainability and resilience of water supply and access through greater efficiency and enhanced water supply and treatment infrastructure	<p>Jordan is one of the most water-scarce countries in the world, and many of its water sources are transboundary in nature. The country's renewable water supply currently only meets about half of the population's water demands, with groundwater being used twice as quickly as it can be recharged. Water deficit has been handled through the unsustainable practice of overdrawing highland aquifers, resulting in lowered water tables and declining water quality. As a result of water challenges, the water sector in Jordan also suffers from problems related to fiscal sustainability (discussed in section 2.1) - exploring ways to enhance efficiency in water provision will be key for financial sustainability and building climate resilience.</p> <p>A high rate of population growth and the influx of refugees from regional conflicts put additional strain on an already stressed water supply, while changing rain patterns and temperature increases threaten to exacerbate the problem. Competition between the agricultural, domestic and industrial sectors is already strong and will continue to grow, especially as the availability of freshwater decreases. Furthermore, approximately 14% of electricity in Jordan has historically been used to pump drinking water and to treat wastewater.</p> <p>Sustainable, efficient and inclusive supply and access to safe drinking water and proper sanitation services, and exploration of new and alternative sources and technologies, is therefore critical to the country's long-term economic and development stability and ensuring equity of access. Any effort to increase supply to water should pay due consideration to (1) future precipitation and rainfall scenarios so that groundwater resources' supplies are not overestimated, and (2) the level of demand from water resources from other sectors, to avoid increasing vulnerability in other sectors.</p>	X	X	X	
2	Improving food security through enhancing the resilience and productivity of agriculture	<p>Jordanian agriculture is established in the highlands and marginal steppes where most of the rain-fed farming is practiced, the Badia, and the lowlands. Changing rain patterns and temperature increases threaten to reduce water availability and agricultural yields in this region, with subsequent impacts on food security and income security. Reduced yields would have particularly harmful consequences on women, as the sector remains a critical source of informal employment for the country's poorest citizens, and also serves as a major source of subsistence and food security in the country.</p> <p>Rain-fed land was exploited extensively for arable agriculture, so the expansion of the sector has relied on increased irrigation. Currently, irrigated agriculture consumes around 64% percent of the country's water resources. However, this share is expected to decrease as water will be prioritized for domestic and industrial uses.</p> <p>For these reasons, it will be key for Jordan to re-think its agricultural production model in a way that is resilient and inclusive. An agricultural sector that aims to increase productivity, and that creates a strong export economy and a range of jobs, will need to adapt to the impacts of climate change as well as embrace modern technologies, new crops, and ensure efficient energy and water use. Jordan will also benefit from improving the reliability and efficiency of food import supply chains to increase food security. In doing so, Jordan can create a thriving and sustainable agriculture sector and ensure future food security for all.</p>	X	X	X	X
3 ⁷⁹	Promote and support a long-term symbiotic relationship with ecosystems, by protecting and restoring ecosystems and regulating land and resource use, and protecting vulnerable areas	<p>Terrestrial ecosystems in Jordan are facing challenges as a result of pressures including climate change and rapid urbanisation. Desertification is progressing and the population of a considerable number of species of flora and fauna has decreased. Similarly, marine ecosystems are suffering the impacts of both climate change and industrial development, as sea surface temperatures and water pH levels increase as a result of atmospheric CO₂ levels, and the oxygen content of water is altered as temperatures increase and human activities increase nutrient flows from land to sea.</p> <p>These ecosystems provide key services essential for the population of Jordan to thrive, and for cities to be shielded from the impacts of climate change. Such services include soil stability (ensuring sustainable production of food, stability of buildings in cases of extreme events and reducing occurrence of landslides), water purification (ensuring a minimum level of freshwater remains available), fish diversity (providing income and food to farmers), natural assets (that attract tourists and provide income to workers in the tourism industry), water absorption (reducing the magnitude of flooding in cases of heavy rainfall or storm surges), and mitigating urban heat island effects).</p>	X	X	X	X

⁷⁹ This pillar may alternatively be split to include (1) one pillar on protection and restoration of ecosystems and (2) one pillar on infrastructure resilience and climate-conscious integrated land-use planning

	Pillar	Rationale	Contributes to mitigation		Contributes to adaptation	
			Reduces emissions	Decreases climate sensitivity	Increases adaptive capacity	Reduces exposure
		<p>Poor and marginalised communities will be first to suffer from the disruption in any of those ecosystem services, as they have reduced access to alternative sources of income, and increased reliance on natural resources for their livelihoods.</p> <p>It is only through restoring and protecting ecosystems, greening urban areas, and overall supporting a symbiotic relationship between ecosystems and civilization that can Jordan protect its cities, vulnerable populations and biodiversity without compromising the stability of its socio-economic growth.</p>				
4	Enhancing the adaptive capacity of the health sector to address climate induced health impacts and emerging infectious diseases	<p>Climate change poses numerous threats to human health, including heat stress, shifting patterns and prevalence of infectious diseases, malnutrition, and water scarcity. These threats are exacerbated by a rise in population and may worsen in the long term due to increased use of treated wastewater in irrigation of trees or vegetables. This could increase the opportunity for transmission risk of several pathogens through crop contamination, potentially causing outbreaks like Typhoid fever or Hepatitis A if the water is not well treated.</p> <p>Jordan has recognised that its health system must plan for existing and future risks, respond punctually, and increase resilience and preparedness. Yet, health infrastructures in Jordan are already stretched beyond their capacity to supply even basic health protection. While there is an increasing awareness that climate change poses significant health threats, health practitioners have historically concentrated on responses that deal reactively with climate-sensitive diseases, for example through curative treatment.</p> <p>To be truly resilient, Jordan must ensure its health system is not only responsive but able also prepared for these impacts. Building a strong, inclusive and resilient health service will enable Jordan to respond efficiently and effectively to future climate related health impacts and ensure all citizens are supported and cared for. Adapting the health sector to climate change will require human resources, knowledge and committed institutions as well as financial resources, technology, and public health infrastructure.</p>			X	
5	Enhancing the resilience and efficiency of urban areas and infrastructure to climate change impacts, and supporting sustainable urbanization through climate-conscious integrated land-use planning	<p>Jordan's cities have grown at a rate unrivalled by other cities in the MENA region - doubling, or depending on regional conflict, tripling every 25-30 years has been the latest trend. This has resulted in continued urban sprawl, combined with a lack of urban planning for a number of decades. The Syrian refugee crisis has also created a problem of informal settlements.</p> <p>Urban areas and infrastructure (including both buildings, and essential infrastructure such as roads and transportation networks, sanitation, water and waste infrastructure, and telecommunications) in Jordan will become increasingly vulnerable to the impacts of climate change. Enhancing the resilience of urban infrastructure to hazards such as storms, heat waves, subsidence, will ensure the safety and security of civil society, as well as ensuring the continued functioning of socio-economic activities of people and communities. Disruptions will affect, for example, economic productivity, local commercial activities and tax revenues. Such disruptions also might harm directly individuals' well-being by creating safety hazards.</p> <p>Effective and climate conscious urban planning can act to mitigate climate risks (such as extreme heat and flooding) whilst also promoting urban development that encourages low-carbon behaviours, such as enabling walking, cycling and public transport use through integrated and transit-oriented development, integrated renewables, and energy efficiency measures in buildings (both commercial buildings and homes) to reduce energy consumption. It can also enable efficiencies through increased densities, such as district cooling, and provide well-being benefits through, for instance, urban green space. Ensuring that urban areas of the future are planned pro-actively with climate considerations and energy efficiency in mind will bring benefits for all residents, businesses and ecosystems.</p>	X	X	X	X
6	Supporting a sustainable transport sector through development of accessible, diverse, efficient and low carbon transportation and enhancing the resilience of	<p>Jordan's transportation and logistics sector is the single largest emitting sector, responsible for 38% of Energy emissions. It plays a key role in the economy, being crucial to the flow of trade through the region and is expected to grow at 5-6% annually to 2030. Having a properly functioning network of transportation infrastructure enables and empowers the movement of people and goods in and between communities. Yet, climate change events may cause disruptions to the network, with high precipitation events and snow events often bringing affected areas to a standstill.</p>	X	X	X	X

	Pillar	Rationale	Contributes to mitigation		Contributes to adaptation	
			Reduces emissions	Decreases climate sensitivity	Increases adaptive capacity	Reduces exposure
	transportation infrastructure to climate change impacts	<p>Much of the transport network is located at areas with high risk of flash floods and snowstorms. Disruptions in the network reduce economic productivity, harming local commercial activities and tax revenues. Such disruptions also directly harm individuals' well-being by restricting their mobility or creating safety hazards.</p> <p>Improving the resilience of the transport network should also include improving its adaptability to future developments and trends. Globally, the transport sector is rapidly electrifying, developing new and alternative technologies and mobility solutions, and promoting increased use of public transit and non-motorised options. Ensuring that transport infrastructure is adapted to the impacts of climate change, as well as ensuring Jordan is ready to transition to lower carbon technologies whilst proactively diversifying the range of technologies and modes available to all citizens, will be critical to ensuring a resilient and sustainable future transport system. This also includes supporting and promoting non-motorised modes, including considerations such as safety, comfort, accessibility and support for walking and micro-mobility options.</p>				
7	Improving the social, natural and economic resilience of coastal areas to climate change impacts	<p>The impact of climate hazards on coastal areas in Jordan could have significant socioeconomic effects. Sea level rise or any changes to the sea surface temperature and CO₂ concentration level occurring in the Gulf of Aqaba could result in the loss of numerous marine species including fish (affecting both ecosystems and commercial fisheries). Potential property losses might occur due to the loss of terrain, biodiversity and ecosystems. Such losses may result from the geographical situation of infrastructure such as hotels and factories in the Gulf of Aqaba to reduce these key economic assets' exposure to hazards such as floods and storm surges hitting the coastline. In addition, other socioeconomic effects might occur, such as increased risk of disease, economic losses in the tourism sector due to the loss of biodiversity, ecosystems and their goods and services, and loss of or change to the distribution of fisheries along the coast of the Gulf of Aqaba reducing income and food security in fish farming communities.</p> <p>Building social, natural and economic resilience in coastal areas through strengthening coastal conservation and management at Aqaba is therefore critical for economic and social stability and sustainable growth.</p>		X	X	X
8	Improving the adaptive capacity of social capital at national and local levels to climate change impacts	<p>In all sectors, the Jordanian population is the ultimate bearer of the consequences of climate change. By being exposed to all events and hazards, the population may suffer from reduced connectivity and access to services, low food and water supply, severe losses such as housing and income, or damages to health.</p> <p>Building adaptive capacity through education, awareness raising, and training is an essential step in preparing adaptation strategies, to ensure that the population is able to prepare and adjust its practices to future events and long-term trends. However, placing the responsibility on citizens alone to adapt may exclude the most vulnerable and marginalised population, who have lower access to resources and to information. It also increases the burden on women, traditionally caring for the households and often already spending large amounts of time doing unpaid work to care for the children. Yet, these groups also most likely to lose their livelihoods as a result of climate change due to their informal or low-paying jobs often highly dependent on natural resources (fishing, agriculture, nature tourism), and usually poor access to basic services.</p> <p>By adopting a whole-of-society approach to climate change instead of isolated measures aimed at increasing the adaptive capacity of a few, Jordan can ensure that any future decision-making accounts for the potential impacts of climate change on all citizens. Through inclusive and far-reaching measures, the government may provide appropriate safety nets to citizens (such as insurance schemes, retraining programmes, etc). This also involves mainstreaming climate change in existing social policies. Poverty reduction strategies may for example explicitly account for climate change impacts as a factor of poverty and as threat to poverty reduction. The Covid-19 crisis provides an example of how such transboundary impacts may bring social progress to a halt, having reversed decades of progress on poverty, healthcare and education in just a few months⁸⁰.</p>			X	
9	Enhance resilience to exogenous factors affecting social and economic stability (disruption of imported	<p>Jordan's recent history and associated policy responses has been shaped by a series of crises – from energy supply to refugee influx, and now a pandemic. The responses to these crises have, by necessity, been reactive – identifying ways to manage and respond to these external pressures. Jordan continues to face a number of challenges, driven by demographics, geography, and politics. For example, Jordan has around 4 million refugees from various origins which combined with the estimated number of foreign workers in Jordan, totals over 5 million—potentially around half of Jordan's total estimated population. The structure of Jordan's economy makes it</p>	X	X	X	X

⁸⁰ United Nations Department of Economic and Social Affairs (July, 2020). *UN report finds COVID-19 is reversing decades of progress on pervert healthcare and education*. Accessible at <https://un.org/development/desa/en/news/sustainable/sustainable-development-goals-report-2020>

	Pillar	Rationale	Contributes to mitigation		Contributes to adaptation	
			Reduces emissions	Decreases climate sensitivity	Increases adaptive capacity	Reduces exposure
	energy supply, refugee influx)	<p>especially vulnerable, as the country is deeply linked to the global economy, importing around 90 percent of its food items and energy requirements. As such, the country's energy security is vulnerable to international and regional developments, as well as to fluctuations in energy prices. Acceleration of economic development and rising standards of living have made energy security an increasing top priority. This is particularly challenging for Jordan, which suffers from scarcity of natural resources, combined with the regional instability and conflicts.</p> <p>Enhancing resilience to these exogenous factors will help Jordan to respond to short term crises and ensure decisions taken are consistent with responding to climate change and supporting sustainable development.</p>				
10	Enhance resilience to exogenous factors affecting access to resources (trade of products such as agriculture and transboundary water issues)	<p>Jordan is ranked as the second poorest country in the world in terms of water resources, with less than 100 m³/capita/year of renewable water resources. Furthermore, Jordan's water sources are largely transboundary in nature, making them vulnerable to the actions of neighbouring countries. While Jordan's population is expected to increase as a result of natural population growth, the country has also experienced population growth due to the influx of multiple waves of refugees putting additional strain on Jordan's already severely limited water resources.</p> <p>Jordan is also highly dependent on regional exchanges and imports for food, importing around 90 percent of its requirements. Furthermore, agricultural product exports are a significant contributor to Jordan's overall export profile; strong productivity and competitiveness of the sector are clearly shown despite its relatively small contribution of 6.1% to the country's GDP. The Jordanian agriculture exports represented approximately 18% of Jordan's exports (or US\$ 6.2 billion) in 2016. Exporting agricultural produce has been affected by the conflict in Syria, causing a severe decline of around 25% as well as disrupting overland exports to other markets.</p> <p>In a country already suffering from scarcity of natural resources and from pre-existing vulnerabilities in its delivery systems, it will be critical to strengthen and enhance resilience to future factors affecting access to resources and markets, including climate change. There is a critical need for a large and ambitious agenda to help the country face destabilising threats, with a focus on investing in and upgrading the country's structures thus strengthening the country's resilience.</p>		X	X	X
11	Enhance "Forest's protection and expansion" programmes	<p>According to the U.N. FAO, 1.1% or about 98,000 ha of Jordan is forested with approximately 47,000 ha of planted forest. Jordan's forests are estimated to contain 2 million tonnes of carbon in living forest biomass. The conservation of forests around the world, and in Jordan, is not a luxury but a national and human duty because of the direct connection with humanity's livelihood, progress, and even survival.</p> <p>Forests provide crucial forestry products, while also contributing to healthy ecosystems, biodiversity, and carbon sequestration. Therefore, protection and expansion of forests – in ways that do not further exacerbate stresses (e.g. water) – must be prioritised.</p> <p>As well as protection of existing forests, sustainable forest management can bring wider benefits. As defined by the FAO, the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems. Sustainable management is essential to ensure society's demands don't compromise the resource whilst ensuring that the benefits of protecting forests can be realised through, for example, direct employment opportunities in forestry management and forestry products, and indirect opportunities and benefits through natural amenity use.</p>	X	X		
12	Enhance the resilience of the tourism sector in the face of climate change by enhancing the preparedness and adaptive capacity of the sector, ensuring growth and development is sustainable and cultural heritage is protected	<p>Jordan has a thriving tourist economy, with visitors drawn to the country by its numerous historical, natural and cultural attractions including its ancient historical sites, culture, hiking, coral reefs and cities. According to the Ministry of Tourism and Antiquities, this sector has the potential to be one of the largest sector in terms of future employment, and it is among the highest producer of foreign exchange. Tourism contributes to around 20 % of the country's gross domestic product (GDP) (2018). It is therefore important to protect this sector, since climate impacts on built infrastructure, transport and ecosystems could all negatively affect the tourism sector. Cultural heritage (tangible and intangible and Natural) in Jordan is also extremely vulnerable to climate change, and thus specific policies are required for adaptation.</p> <p>Jordan has invested heavily in its tourist infrastructure in the form of luxury hotels, spas, resorts, and real estate projects, expansion of the international airport and new cruise ship terminal. Ensuring that the growth of the sector</p>	X		X	

	Pillar	Rationale	Contributes to mitigation	Contributes to adaptation		
			Reduces emissions	Decreases climate sensitivity	Increases adaptive capacity	Reduces exposure
		takes account of climate impacts and builds its preparedness, protects cultural heritage, as well as increasing its own contribution to sustainability through integrating measures to reduce the sector's climate impact, will be important for ensuring a sustainable and resilient future tourism sector. This will have direct impact on short-term economic outcomes, but also and most importantly on longer-term collective memory/identity and well-being.				
13	Supporting enhanced energy efficiency and electrification across all sectors, including incentivising the update of lower carbon technologies in all sectors, in order to realise greater efficiencies	<p>All long-term pathways to decarbonisation require a phase out of fossil fuels and an increasing share of renewable electricity generation, with electrification of end-uses and greater levels of efficiency through behaviour change.</p> <p>Currently, Jordan's electricity generating capacity exceeds demand by up to 30%, due in part to consumers' tendency to increase the use of energy-saving technologies, and to expand dependence on self-generation through small and large renewable energy projects, as well as economic growth decline as a result of political conditions in the region. This has caused significant costs for the electrical system since there is a commitment to pay for the cost of capacity for the power stations, even if their operation is suspended.</p> <p>Technologies and systems are increasingly electrifying – electric vehicles and cooling systems for example – and demand for electricity will increase as more services and systems switch to electric and digital. This not only includes in homes and offices, but the increasing digitalisation of sectors such as transport, agriculture, and the drive for newer and more efficient technologies for water pumping, treatment and management for example. Whilst there is currently a surplus of electricity for Jordan, over the long term it will be important to respond to growing demand for electricity from new and existing sectors, encourage the transition to electricity and lower carbon technologies, and plan to balance greater demand for electricity through greater energy efficiency and continued behaviour change and adjustment by end-users.</p>	X			
14	Increasing decarbonisation and diversification of electricity generation by increasing the contribution of local and renewable energy sources to the total energy mix	<p>Acceleration of economic development and rising standards of living have made energy security a top priority in Jordan. Despite efforts to reduce dependency from imports and some progress in diversifying the energy mix, energy security remains critical: the country imports more than 93% of its energy, which represents approximately 8% of GDP, and despite the favourable conditions for solar and wind, Jordan's energy mix is also still dominated by imported fossil fuels and natural gas.</p> <p>Jordan is attempting to diversify its providers of fossil fuels while increasing its domestic production of renewable energies (particularly wind and solar). Long term decarbonisation pathways will all necessitate a greater share of electricity generation from renewable energy, to both enable the phase out of fossil fuels and the switch to electrification. Although in the short term the need for investment in new generation capacity is limited, in the longer term, this will likely be required to meet predicted growth in demand and investing in local renewable sources will also improve resilience to external shocks.</p>	X		X	X
15	Promoting resource efficiency through integrated and circular waste and resource management systems	<p>Growing industrialization and high population growth rate has led to rapid increase in solid waste generation in the country which has, in turn, put increasing pressure in waste management infrastructure. Whilst the waste sector contributed only 12% of total emissions in 2016, it has grown 369% since 2000. Around 2 million tonnes of municipal waste is generated in Jordan each year with most of it diverted to unsanitary landfills and dumpsites. Improper solid waste disposal is leading to public health risks, adverse environmental impacts as well as socio-economic problems. As population growth continues at pace, waste generation rates and treatment needs will rapidly become a serious issue.</p> <p>Municipalities do not have enough funds to setup modern waste collection infrastructure, recycling facilities, waste disposal systems and waste to energy plants. Source-segregation is not practiced in the country and mixed waste is collected and dumped without any treatment. Recycling, both formal and informal, is at early stages due to lack of trained manpower and modern machinery.</p> <p>It will be critical to ensure that new waste treatment facilities, waste collection systems and recycling facilities are available to manage increasing levels of waste sustainably for the health and well being of communities and the environment. It will also be important to combine these with waste reduction and circular approaches whereby waste becomes a resource, with modern and low impact treatment systems such as composting and anaerobic digestion.</p>	X		X	

5.5.3 Suggested long-term actions under each pillar



The following sections summarise **existing long-term actions that are currently planned** under each of the pillars and includes suggestions of additional actions that may be undertaken to ensure they are achieved by 2050. The resulting list is **not exhaustive, and some suggested actions may fit under several pillars**. Note that this section only focusses on the long-term actions and not existing and planned short- and medium-term actions. They are necessarily high level as they are intended as 'strategic' and provide guidance on suggested priority action areas. Detailed implementation of specific measures is recommended to be undertaken as part of sectoral and shorter-term planning.

Unlike the pillars, these suggested actions could be prioritised following a process such as that laid out in Section 5.5.4 (action criteria).

Pillar 1: Enhancing sustainability and resilience of water supply and access through greater efficiency and enhanced water supply and treatment infrastructure

Actions under this pillar could contribute focus on providing sustainable, efficient and inclusive supply and access to safe drinking water and proper sanitation services, while ensuring that improvement in water supply does not compromise water access in other sectors nor depletes existing resources (leading to maladaptation). They could also support greater energy efficiency in the water sector, across both distribution and treatment, and opportunities to reduce emissions from treatment processes.

These existing efforts from the Ministry of Water and Irrigation (MWI) and other ministries translate into four long-term actions that may feature in the LTS:

- 1. Integrating climate adaptation in policy planning systematically**
- 2. Supporting and scaling innovative solutions for safeguarding water resources**
- 3. Developing the use of non-conventional water sources**
- 4. Enhancing energy efficiency in the water sector**

Additional long-term actions that may feature in the LTS under this pillar but are not currently widely adopted include:

- 5. Promoting and upscaling measures to increase efficiency in the use of water resources**
- 6. Improving water demand management to reduce the gap between water demand and supply**
- 7. Increasing resilience of water infrastructure to future climate impacts resulting from slow-onset changes or extreme weather events**
- 8. Ensuring all wastewater treatment facilities utilise advanced treatment methods**

Pillar 2: Improving food security through enhancing the resilience and productivity of agriculture

Actions under this pillar could focus on creating an agricultural production system that is resilient and inclusive, through increased productivity, job creation, modern technology, efficient resource-use and climate-smart practices.

Several activities contributing to this pillar are currently planned. They can be summarised in the following long-term actions that may feature in the LTS:

- 1. Learning from and adapting traditional agricultural practices and products to changing agroclimatic conditions**
- 2. Protecting farmers against losses of livelihoods due to climate change**
- 3. Using data and new technologies to improve efficiency of agricultural practices, including resource-use efficiency (water, energy, etc)**
- 4. Enhancing efficiency along the food chain, including post-harvest**

Additional long-term actions that may feature in the LTS under this pillar but are not currently widely adopted include:

- 5. Integrating climate adaptation in policy planning systematically**
- 6. Improving and implementing agricultural land management and land use regulations (land rights, building permits, etc)**

- 7. Adopting a landscape-based approach to agricultural production, to protect and supporting ecosystems and carbon sinks**
- 8. Increasing contribution to scientific research on resilient crops, livestock and the and future food production systems**

Pillar 3: Promote and support a long-term symbiotic relationship with ecosystems, by protecting and restoring ecosystems and regulating land and resource use, and protecting vulnerable areas

Actions under this pillar could focus on restoring and protecting ecosystems, greening urban areas, and supporting a symbiotic relationship between ecosystems and civilization so that that can Jordan protect its cities, vulnerable populations and biodiversity without compromising the stability of its socio-economic growth.

Currently, several ongoing or planned initiatives feed into the following long-term actions that should feature under the LTS:

- 1. Protecting and restoring key ecosystems and habitats**
- 2. Increasing knowledge base on ecosystems and biodiversity, monitoring their evolution and their interaction with human systems**

Based on the analysis provided, some recommended additional long-terms actions include:

- 3. Strengthening the role and increasing the agency of the private sector in ecosystems and biodiversity conservation and protection**
- 4. Promoting and upscaling nature-based solutions in all sectors**
- 5. Strengthening legislation and regulating land-use according to users' interaction with ecosystems**
- 6. Improving habitat connectivity by linking existing protected areas and designing new ones in areas identified as possible animal-human interactions**

Pillar 4: Enhancing the adaptive capacity of the health sector to address climate induced health impacts and emerging infectious diseases

Actions under this pillar could focus on building a strong, inclusive and resilient health service for Jordan to respond efficiently and effectively to future climate related health impacts, ensuring all citizens are supported and cared for.

Currently, there are no long-term actions that can be derived from existing plans and strategies which may contribute to this pillar. We recommend that the following long-term actions are considered under the LTS:

- 1. Integrating climate adaptation in policy planning systematically**
- 2. Building the knowledge, awareness and capacity of public health and healthcare professionals to monitor, diagnose and treat climate-related health issues**
- 3. Developing new methods and tools for preparing for, coping with and recovering from climate-related disease outbreaks**
- 4. Improving communication with citizens and increasing their knowledge and understanding of climate-related health hazards, such as zoonoses, water contamination, extreme weather events**

Pillar 5: Enhancing the resilience and efficiency of urban areas and infrastructure to climate change impacts, and supporting sustainable urbanization through climate-conscious integrated land-use planning

Actions under this pillar could focus on developing and implementing effective and climate conscious urban planning, to prevent potential impacts from climate change (such as extreme heat and flooding) whilst also promoting urban development that encourages low-carbon behaviours.

Currently, a few actions are planned to sustainably develop cities. These include those in plans developed by local governments (e.g. Greater Amman Municipality). These can be gathered in the following long-term actions to feature in the LTS:

- 1. Promoting and upscaling the use of energy saving technology and materials in cities**
- 2. Developing infrastructure that withstands and alleviates the impact of extreme weather events (resilient buildings, drainage, etc)**
- 3. Enforcing resource use efficiency (water, energy etc) through building codes**
- 4. Ensuring equitable and sustainable land-use planning**
- 5. Ensuring transit-oriented land-use planning to promote walkability and sustainable mobility**

Based on the mitigation and adaptation analysis provided, we recommend that the following additional long-terms actions are also included in the LTS:

- 6. Embedding climate risks and vulnerability assessments in all urban planning initiatives (including mapping of vulnerable areas, etc)**
- 7. Enforcing climate resilience and ecosystem protection through building codes**
- 8. Increasing the amount of quality green spaces in cities**
- 9. Promoting building standards to encourage low energy demand, including passive cooling designs**

Pillar 6: Supporting a sustainable transport sector through development of accessible, diverse, efficient and low carbon transportation and enhancing the resilience of transportation infrastructure to climate change impacts

Actions under this pillar could focus on developing a transport infrastructure that is resilient to the impacts of climate change and uses lower carbon technologies, whilst being diversified and offering a range of technologies and modes to all citizens.

Currently, there are a number of actions that can be derived from current long-term strategies, which would support this pillar. These can be gathered in the following long-term actions to feature in the LTS:

- 1. Developing and promoting access to a sustainable and efficient public transport system**
- 2. Switching freight transportation and logistics to more sustainable modes**
- 3. Supporting the development of infrastructure to enable lower carbon transport technology adoption and use (such as charging infrastructure)**

Based on the adaptation and mitigation analysis provided, we recommend that the following additional long-terms actions are also included in the LTS:

- 4. Developing a transport infrastructure that is suitable to future climate (considering both slow-onset changes and extreme events)**
- 5. Fostering sustainable mobility through improved land-use planning and infrastructure to promote pedestrianisation, non-motorised and micromobility transport modes**
- 6. Providing incentives for uptake of electric vehicles via subsidies, taxes or road access priority rights**
- 7. Phasing out fossil fuel use in land and marine transport systems including exploring alternative fuels where electricity is not feasible (such as biogas, green hydrogen & ammonia)**
- 8. Supporting the development of infrastructure and systems for future transport services (such as autonomous and on demand services)**
- 9. Promoting fuel efficiency, alternative fuels, and more efficient operations and management practices for aviation including encouraging use of alternative land transportation systems**

Pillar 7: Improving the social, natural and economic resilience of coastal areas to climate change impacts

Actions under this pillar should focus on ensuring that the social and economic growth in Aqaba does not compromise its ecosystems, through strengthening of coastal conservation and management.

Some initiatives are currently undertaken and can be summarised under the following long-term actions, which should feature in the LTS:

- 1. Improving monitoring of the marine and coastal ecosystems, their evolution and how they interact with the climate and with human activity**
- 2. Enforcing rules to prevent marine and coastal pollution from human activities**

Based on the adaptation and mitigation analysis provided, we recommend that the following additional long-term actions are also included in the LTS:

- 3. Embedding climate vulnerability and risk assessments in coastal zone management and planning**
- 4. Developing incentives for ecosystem protection and conservation and imposing limits to coastal development on the private sector**
- 5. Improving communication and increasing awareness-raising on coastal climate-related risks, to ensure preparedness of citizens and businesses in case of extreme events and anticipation of slow-onset changes**

Pillar 8: Improving the adaptive capacity of social capital at national and local levels to climate change impacts

Actions under this pillar could focus on ensuring that climate change planning adopts a whole-of-society approach in Jordan.

Currently, the following long-term action is partly implemented and may be integrated in the LTS under this pillar in order to be upscaled:

- 1. Engaging local communities in the planning, design and implementation of local and national climate change plans**

Additional long-term actions that may feature under this pillar include:

- 2. Improving the existing social protection systems to help vulnerable groups cope with the impacts of climate change (the poor, orphans, elderly, women and children)**
- 3. Improving access to health, sanitation, information and other key social services**
- 4. Integrating climate adaptation into national poverty reduction policies**

Pillar 9: Enhance resilience to exogenous factors affecting social and economic stability (disruption of imported energy supply, refugee influx)

Actions under this pillar could focus on preventing disruptions in social and economic development by anchoring climate change and sustainable development planning in an international context, while reducing the country's reliance on external energy supply.

Currently, there are several actions planned or being undertaken (for example, related to energy, food and water) that can be summarised in the following long-term action for the LTS:

- 1. Increasing energy self-sufficiency through utilisation of domestic natural and renewable resources**
- 2. Developing Jordan as a regional centre for energy**

Additional long-term actions that may feature under this pillar include:

- 3. Integrating considerations of current and future refugee populations into long-term urban planning and resource allocation**
- 4. Including projections of the social, economic and environmental contexts of neighbouring regions and of other key economic partners in sectoral and national planning**
- 5. Supporting private businesses and the financial sector in planning for and withstanding the impact of exogenous factors on their activity**
- 6. Developing advanced energy storage solutions, grid flexibility, stability, expansion and management technologies to manage supply and demand**
- 7. Supporting systemic integration of sector-coupling solutions that link energy-consuming sectors with the power-producing sector**

Pillar 10: Enhance resilience to exogenous factors affecting access to resources (trade of products such as agriculture and transboundary water issues)

Actions under this pillar could focus on preventing shortages in key resource supply, and preventing resource competition with neighbouring countries.

Currently, an overarching objective from Jordan Vision 2025 can be summarised in the following long-term action for the LTS:

- 1. Ensuring the business and investment environment and competitiveness, to attract local and foreign investment, and build resilient local businesses and partnerships**

As part of the LTS, the following long-term actions could be considered under this pillar:

- 1. Developing management plans for transboundary watersheds which are shared with neighbouring countries and not sustainably or effectively protected by political agreements**
- 2. Developing internal market for agriculture products**
- 3. Diversifying Jordan's exports through increasing competitiveness in sectors other than agriculture**

Pillar 11: Enhance "Forest's protection and expansion" programmes

Actions under this pillar could focus on protecting existing forests as well as support inclusive and sustainable forest management.

Efforts are currently being undertaken to protect and expand forest areas in Jordan. These may translate into the following long-term actions for the LTS:

- 1. Protecting and expanding forests in ways that do not further exacerbate climate sensitivity in other sectors**

Other long-term action that may contribute to achieving this pillar include:

- 2. Increasing knowledge and skills in forest conservation and management and providing economic opportunities (i.e. equitable job creation)**

Pillar 12: Enhance the resilience of the tourism sector in the face of climate change by enhancing the preparedness and adaptive capacity of the sector and ensuring growth and development is sustainable and cultural heritage is protected

Actions under this pillar could focus on ensuring that the tourism sector takes account of climate impacts and builds its preparedness, as well as increasing its own contribution to sustainability through integrating measures to reduce the sector's climate impact.

Currently, several actions planned or being undertaken that can be summarised in the following long-term action for the LTS:

- 1. Ensuring energy efficiency, resource efficiency and low carbon technology use in tourism operations**
- 2. Promote and scale up eco-tourism experiences in protected areas and stimulate linkages with other tourism products**

As part of the LTS, the following long-term actions could be included under this pillar:

- 1. Developing and ensuring access to early warning systems for tourists**
- 2. Developing protection schemes, retraining programmes and supporting income diversification for employees of the tourism sector**
- 3. Expansion of eco-tourism into new locations and ensuring equitable and inclusive sharing of benefits**
- 4. Promoting measures to protect and sustainably manage cultural sites and heritage**

Pillar 13: Supporting enhanced energy efficiency and electrification, including incentivising the update of lower carbon technologies in all sectors, in order to realise greater efficiencies

Actions under this pillar could focus on increasing the use of electricity as the primary energy source for Jordan and the phase out of fossil fuels, through promotion of lower carbon technologies combined with enhanced energy efficiency.

Currently, there are several actions planned or being undertaken that can be summarised in the following long-term action for the LTS:

- 1. Enhancing energy efficiency in all sectors**

- 2. Ensuring efficient built environments and adoption of lower carbon building systems through green building codes and green building strategy**
- 3. Promoting retrofitting and technology upgrade programmes**
- 4. Development of eco-villages**
- 5. Supporting the development of infrastructure to enable electric transport technology adoption and use (such as charging infrastructure)**

Based on the analysis provided, some additional long-term actions that could be included are:

- 6. Deployment of smart meters and smart grid digitalisation, to manage end-user demand**
- 7. Promotion of advanced building controls, automation and power management systems**
- 8. Encourage electrification of industry and energy efficient equipment**
- 9. Phasing out fossil fuel use**
- 10. Upgrading or providing higher efficiency chillers and air conditioning units, including passive cooling systems**

Pillar 14: Increasing decarbonisation and diversification of electricity generation by increasing the contribution of local and renewable energy sources to the total energy mix

Actions under this pillar could focus on enhancing the diversification of electricity generation and increase domestic production of renewable energies (particularly wind and solar). Long term decarbonisation pathways will all necessitate a greater share of electricity generation from renewable energy, to both enable the phase out of fossil fuels and the switch to electrification and improve resilience to external shocks.

Currently, several actions planned or being undertaken that can be summarised in the following long-term action for the LTS:

- 1. Reducing the use of natural gas for power generation**
- 2. Increasing the use of national resources for generating electricity, specifically growing renewable energy technologies**
- 3. Providing an enabling environment for the growth of the Energy Services (ESCO) Market**
- 4. Expansion of large-scale renewable energy generation including concentrated solar power**
- 5. Promoting integrated and distributed renewables for buildings and households**
- 6. Expanded energy storage through batteries to reinforce the electrical grid and maintain its suitability**

Based on the analysis provided, some additional long-term actions could include:

- 7. Systemic integration of sector-coupling solutions that link energy-consuming sectors with the power-producing sector**
- 8. Developing advanced energy storage solutions, grid flexibility, stability, expansion and management technologies to manage supply and demand**
- 9. Expansion of the transmission system for connecting more sources and carrying more power, including modernizing the transmission system**
- 10. Deployment of smart meters and smart grid digitalisation, forecasting technologies to predict real-time output of variable renewable energy generation**

Pillar 15: Promoting resource efficiency through integrated and circular waste and resource management systems

Actions under this pillar could include supporting an ultra-low waste and efficient resource use economy, with minimal waste to landfill, upgraded landfill facilities, and increased rates of reuse and recycling combined with modern organic waste treatment systems.

Currently, several actions planned or being undertaken that can be summarised in the following long-term action for the LTS:

- 1. Expansion of biogas collection and utilisation from remaining landfill sites**

2. **Comprehensive waste collection, sorting, reuse and recycling**
3. **Support to SMEs in the waste management sector to create new markets and opportunities, and green jobs**
4. **Support clean material recovery facilities and recycling programmes**

Based on the analysis provided, some additional long-terms actions could include:

5. **Advanced treatment facilities for organic waste such as composting and anaerobic digestion**
6. **Development comprehensive waste reduction programmes for all sectors, including residential and commercial food waste**
7. **Development of an industrial symbiosis strategy**

5.5.4 Suggested framework for assessing measures: criteria and rationale



The suggested actions that are included in the LTS under each pillar can also benefit the achievement of Jordan’s national development goals. In order to safeguard development gains, the impacts and benefits of different measures can be assessed. This ensures that actions which have potentially negative impacts are avoided (or impacts can be planned for a mitigated) and actions that deliver multiple co-benefits can be prioritised. By undertaking a process of assessment using a consistent set of criteria and justification, identification and selection of actions can be undertaken transparently and in a way that avoids adverse consequences. Ensuring actions do not generate harmful impacts on communities, or cause maladaptation for example, is important.

Jordan’s NDC update process identified a set of criteria and weightings, shown in Table 5-3, which we suggest could be used as the basis for the LTS action criteria with some suggested modifications based on the need for consideration over a longer-term timeframe.

Table 5-3: NDC prioritisation criteria

	NDC prioritisation criteria	Criteria description	Sub-criteria
1	Impact Potential	Potential of program/ project to contribute to significantly to reduction of emissions or increase resilience	<ul style="list-style-type: none"> • Impact on GHG reduction • Impact on reducing population vulnerability
2	Paradigm Shift Potential	Degree to which the proposed activity can catalyze impact beyond a one-off project investment	<ul style="list-style-type: none"> • Potential for scaling up and replication • Potential for knowledge and learning • Contribution to the regulatory framework and policies
3	SD potential	Wider benefits and priorities, including environment, social and economic co-benefits	<ul style="list-style-type: none"> • Job creation • Improve health/ life quality • Protect environment
4	Gender sensitive development impact	Gender sensitivity of climate change project responsive to recipient’s need. Vulnerability and financing needs of the beneficiary country and population in the target group	<ul style="list-style-type: none"> • Demonstrated gender sensitivity and equity • Involvement of vulnerable group in the project
5	Promote Country Ownership	Beneficiary Country Ownership of and capacity to implement a fund project (policies, climate strategy, and institution).	<ul style="list-style-type: none"> • Coherence and alignment with national climate policy and priority • Organizational capacity to undertake and manage the project

6	Efficiency & Effectiveness	Economic and if appropriate financial soundness of the cost effectiveness and co-financing projects, and mitigation-specific projects.	<ul style="list-style-type: none"> • Demonstrated value for money and financial soundness. • Budget criteria (matching funds: national, International, and private sector)
7	Relevance	The relative priority of activities, including their alignment with wider national priorities	<ul style="list-style-type: none"> • Alignment with national development plan, part of EDP, sectorial plan, crosscutting sector • Alignment with SDGs
8	Readiness	Identifying activities feasibility, scope and timing and identification of the availability of potential funding	<ul style="list-style-type: none"> • Availability of feasibility studies and Quality of project formulation • Project component readiness for implementation and schedule • Availability of financing

*: Weight (0: no impact; 1: very low; 2: low; 3: medium; 4: high; 5: very high)

For the LTS this could be amended to seven impact criteria for assessing climate actions:

- **Adaptation**
- **Mitigation**
- **Sustainable Development potential**
- **Gender sensitive development**
- **Competitiveness**
- **Employment**
- **Paradigm Shift Potential**

These criteria are based on the NDC prioritisation criteria and Ricardo's past experience of developing adaptation and mitigation criteria in other contexts. NDC prioritisation criteria that are *not* at this point included, are

- **Promote Country Ownership:** Sub-criteria of this includes "coherence and alignment with national climate policy and priority" which can be captured under an additional feasibility criterion of 'Relevance'. Additionally, as the LTS should also be the document that sets the climate priorities rather than aligning to them this is less appropriate here.
- **Readiness:** As an LTS is a strategy for the long-term, some actions that should be prioritised may not be considered ready because they fall outside of immediate planning and implementation potential, but should not be discounted on this basis. This criteria is more important for shorter term plans and actions, such as in the NDC context. It is also somewhat captured under an additional feasibility criteria of 'cost'.
- **Efficiency & Effectiveness:** Whilst criteria below on 'cost' incorporates elements of this it is not recommended as a specific stand-alone criteria due to the long-term nature of the strategy, uncertainty on costs and budgets over time, and the need to ensure costly but impactful actions are still included.

Two additional criteria are suggested for inclusion to reflect climate actions' feasibility: **relevance and cost**.

Further details of what each criterion might mean and a suggested scoring process are provided in the sections below, including their underlying rationale.

5.5.4.1 Impact criteria

Adaptation and mitigation impacts

To identify actions for climate actions that provide adaptation and mitigation co-benefits, both an adaptation and a mitigation criterion can be devised:

- the adaptation criterion can apply to all actions, in order to ensure that actions suggested as part of the mitigation work package are neither maladapted nor have potential to lead to broader maladaptation by compounding existing climate vulnerabilities and risks.
- the mitigation criterion can apply to all actions, to identify which action suggested as part of the adaptation work package may also contribute to reducing greenhouse gas emissions.

Each criterion is briefly described in Table 5-4 below.

Table 5-4: Brief description of adaptation and mitigation impact criteria

Criterion	Brief description
Adaptation	Role of the action is reducing climate sensitivity, increasing adaptive capacity or reducing exposure to risks
Mitigation	Level of emission reduced or increased through the action

Other impacts

Additional criteria devised to identify a climate action's impact on and potential contribution to Jordan's sustainable development among economic, social and environmental impacts. This also helps identify impact that does not depend on any specific future climate scenario, hence ensuring the action is beneficial despite modelling uncertainties. Each of these criterion is briefly described in Table 5-5.

Table 5-5: Brief description of other impact criteria

Impact	Criterion	Brief description
Economic	Employment	Employment created or lost through the action <i>Relevant given the current COVID-19 economic impacts</i>
Economic	Competitiveness	Competitiveness gained or lost through the action <i>Relevant given national priorities for self-sufficiency, reducing imports, building a greater export economy, creating greater country ownership etc</i>
Social	Sustainable Development potential	Increases or reductions in environment, social and economic co-benefits through the action, and integration of local communities in its development and implementation process. <i>Relevant given high level of emphasis on sustainable development as a fundamental principle in all policies and strategies Jordan</i>
Social	Gender sensitive development	Increases or reductions in gender equality, opportunities and development through the action <i>Relevant given the importance of promoting gender equality and ensuring development in Jordan is gender-sensitive</i>
Transformative	Paradigm Shift Potential	Degree to which the proposed activity can catalyse impact beyond a one-off project investment <i>Relevant given the need for important shifts in technologies, behaviours, structures and systems for Jordan to transition to a lower emission economy</i>

5.5.4.2 Feasibility criteria

To support the implementation process of each action, instil stakeholder’s confidence in their feasibility, and guide prioritisation for funding between 2020-2050, two additional criteria are recommended to be included: relevance and cost. While the aim of the LTS is to provide a long-term vision for climate resilient development, and therefore should not be constrained by the cost of delivering this vision, the reality is that investment is required to implement the actions. Therefore, cost may influence the prioritisation actions. Each of these criterion is briefly described in Table 5-6.

Table 5-6: Brief description of feasibility criteria

Criterion	Brief description
Coherence	Role of the action in helping to achieve the objectives identified as part of national and sectoral development plans, including their alignment with wider national priorities
Cost	Amount of investment required to complete the action, and the extent to which external financing is needed; economic and if appropriate financial soundness of the cost effectiveness

5.5.4.3 Suggested use of the criteria

Uniform approach

The selection aims to support Jordan’s LTS to adopt an approach whereby adaptation is the primary goal, and that is consistent with Jordan’s national development. Hence, it is recommended that these criteria apply to mitigation and adaptation actions equally, in order to identify:

- (1) Mitigation actions that may lead to maladaptation or that do not bring any adaptation benefits (*adaptation criterion*)
- (2) Climate actions that provide adaptation-mitigation co-benefits (*adaptation and mitigation criteria*) are highlighted
- (3) Climate actions that support Jordan’s national development by providing economic, social and environmental benefits other than adaptation and mitigation (*Sustainable Development potential, Gender sensitive development impact, Competitiveness, Employment*)
- (4) Climate actions that will support Jordan in undertaking transformational development and pathways, attitudes, technologies or systems (*Paradigm shift criterion*).

The resulting assessment will enable Jordan to rule out priority actions that are harmful or do not provide sufficient benefits. It also guides the implementation of the selected actions between 2020 and 2050. It provides a framework for consistently assessing climate actions in future climate planning processes (such as the NDCs) to ensure consistency with the priorities identified in the LTS.

Scoring of the criteria

Impact criteria

Table 5-7 below provides a detailed description of the suggested criteria that can be used for prioritising climate actions based on their impact. It provides further information on their definition, scoring and how to inform it, and the rationale for prioritising an action against this criterion.

ote that this is a suggested approach only and it is recommended that Jordan reviews and refines the criteria and scores as appropriate.

Table 5-7: Detailed description of the suggested impact criteria for prioritising climate actions

Adaptation	
Definition	Action affects:

	<ul style="list-style-type: none"> Climate vulnerabilities in relation to adaptive capacities and/or climate sensitivities, or Climate risks in relation to the exposure of vulnerable assets (people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets etc) to future climate hazards
Score	-5 Large potential for maladaptation
	-3 Small potential for maladaptation
	0 No adaptation benefits
	3 Small adaptation benefits
	5 Large adaptation benefits
Informed by	Scores from the vulnerability and risk assessment.

Mitigation

Definition	Action affects GHG emissions, increasing or reducing emissions.	
Score	-5 Large increases in GHG emissions	
	-3 Small increases in GHG emissions	
	0 No changes to GHG emissions	
	3 Small reductions in GHG emissions	
	5 Large reductions in GHG emissions	
Informed by	Jordan NDC mitigation objectives and measures. Jordan's National Climate Change Policy, NDC & NDC Implementation strategy	

Employment

Definition	Action affects employment opportunities in Jordan, increasing or reducing opportunities.	
Score	-5 Large reductions in employment opportunities	
	-3 Small reductions in employment opportunities	
	0 No changes to employment opportunities	
	3 Small increases in employment opportunities	
	5 Large increases in employment opportunities	
Informed by	A qualitative theoretical assessment of the action's impact on employment, based on expert judgement informed by: <ul style="list-style-type: none"> The action's description Stakeholder's feedback Best practice examples in other contexts 	

Competitiveness

Definition	Action affects competitiveness of the sector and/or of Jordan as a whole, through increases or decreases of productivity, increases or decreases in
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	innovative technologies used, increases or decreases in self-sufficiency, increases or decreases in country ownership, or other competitiveness factors.	
Score	-5	Large decreases in competitiveness, through productivity losses or other
	-3	Small decreases in competitiveness, through productivity losses or other
	0	No changes to competitiveness
	3	Small increases in competitiveness, through productivity gains or other
	5	Large increases in competitiveness, through productivity gains or other
Informed by	<p>A qualitative theoretical assessment of the action's impact on competitiveness, based on expert judgement informed by:</p> <ul style="list-style-type: none"> • Stakeholder's feedback • Sectoral productivity indicators • Technology required 	

Sustainable Development

Definition	Action affects local communities, environment or economy through trade-offs between resilience and development (such as food security, access to services, economic empowerment)	
Score	-5	Negative impacts on communities, environment, or economy with no benefits
	-3	Decreases in the sustainable development benefits to communities, environment, or economy
	0	No changes to sustainable development impacts
	3	Increases in the sustainable development benefits to communities, environment, or economy
	5	Increases in the sustainable development benefits to communities, environment, or economy and local communities included in planning and implementation processes
Informed by	<p>A qualitative theoretical assessment of the action's impact on sustainable development, based on expert judgement informed by:</p> <ul style="list-style-type: none"> • Designated implementing partners and organisational structure. • Where relevant, results of Environmental and Social Impact Assessments. • Where relevant, consideration for local and indigenous knowledge. • Non-exhaustive list of relevant documents including Voluntary SDG review 	

Gender sensitive development

Definition	Action affects gender norms, roles and inequalities and may actively address or amplify them.	
Score	-5	Increases in gender inequality
	-3	Perpetuation of gender inequality
	3	Consideration for gender inequality, avoiding perpetuation
	5	Reduction in gender inequality

Informed by	<p>A qualitative theoretical assessment of the action’s impact on gender, based on expert judgement informed by:</p> <ul style="list-style-type: none"> • Gender Assessment Method for Mitigation and Adaptation (GAMMA) • Gender Marker <p>(See Annex 7 for further details)</p>
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Paradigm Shift Potential											
Definition	Action affects the ability to stimulate shifts in technologies, behaviours, structures and systems to transition to more resilient and lower-emission options, and catalyse impact beyond one-off investment through replication or scaling up.										
Score	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">-5</td> <td>Encouraged lock-in to vulnerable and/or high carbon technologies or behaviours, and with significant wider negative impacts and/or replication</td> </tr> <tr> <td style="text-align: center;">-3</td> <td>Some lock-in to vulnerable and/or high carbon technologies or behaviours with some wider negative impact or replication</td> </tr> <tr> <td style="text-align: center;">0</td> <td>No impact and limited wider impact</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Supports a shift to more resilient or lower carbon technologies or behaviours with some wider positive impact and/or replication</td> </tr> <tr> <td style="text-align: center;">5</td> <td>Catalyses a significant shift to more resilient or lower carbon or behaviours with significant wider positive impact and/or replication</td> </tr> </table>	-5	Encouraged lock-in to vulnerable and/or high carbon technologies or behaviours, and with significant wider negative impacts and/or replication	-3	Some lock-in to vulnerable and/or high carbon technologies or behaviours with some wider negative impact or replication	0	No impact and limited wider impact	3	Supports a shift to more resilient or lower carbon technologies or behaviours with some wider positive impact and/or replication	5	Catalyses a significant shift to more resilient or lower carbon or behaviours with significant wider positive impact and/or replication
-5	Encouraged lock-in to vulnerable and/or high carbon technologies or behaviours, and with significant wider negative impacts and/or replication										
-3	Some lock-in to vulnerable and/or high carbon technologies or behaviours with some wider negative impact or replication										
0	No impact and limited wider impact										
3	Supports a shift to more resilient or lower carbon technologies or behaviours with some wider positive impact and/or replication										
5	Catalyses a significant shift to more resilient or lower carbon or behaviours with significant wider positive impact and/or replication										
Informed by	<p>A qualitative theoretical assessment of the action’s impact on shifting technologies and behaviours and catalysing change beyond initial investment, based on expert judgement informed by:</p> <ul style="list-style-type: none"> • Scores from the vulnerability and risk assessment • Where relevant, results of Environmental and Social Impact Assessments • Mitigation pathways analysis and international literature and best practices • Evidence of scaling up and replication 										

Feasibility criteria

Table 5-8 below provides a detailed description of the suggested criteria to use for identifying climate actions’ feasibility. It provides further information on their suggested definition, scoring and how to inform it, and the rationale for rating an action against this criterion.

Table 5-8 – Detailed description of the suggested feasibility criteria for prioritising climate actions

Relevance					
Definition	Action is coherent or incoherent with national development if it contributes towards or hinders the objectives of national or sectoral development plan. An action contributing to existing goals and objectives is considered more feasible.				
Score	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">-5</td> <td>Action hinders progress towards the objectives of Vision 2025, EDP, sectoral plans, crosscutting sector SDGs and other strategies</td> </tr> <tr> <td style="text-align: center;">0</td> <td>Action does not contribute to progress towards the objectives of the following: Vision 2025, EDP, sectoral plans, crosscutting sector SDGs and other strategies</td> </tr> </table>	-5	Action hinders progress towards the objectives of Vision 2025, EDP, sectoral plans, crosscutting sector SDGs and other strategies	0	Action does not contribute to progress towards the objectives of the following: Vision 2025, EDP, sectoral plans, crosscutting sector SDGs and other strategies
-5	Action hinders progress towards the objectives of Vision 2025, EDP, sectoral plans, crosscutting sector SDGs and other strategies				
0	Action does not contribute to progress towards the objectives of the following: Vision 2025, EDP, sectoral plans, crosscutting sector SDGs and other strategies				

	5	Action contributes to progress towards the objectives of Vision 2025, EDP, sectoral plans, crosscutting sector SDGs and other strategies
Informed by	<p>A qualitative theoretical assessment of the action's coherence, based on expert judgement informed by:</p> <ul style="list-style-type: none"> Objectives featured in the sectoral and national development plans, such as Vision 2025, EDP, sectoral plans, crosscutting sector SDGs and other strategies Sectoral stakeholders' specific ratings based on their knowledge of own strategies and objectives 	

Cost		
Definition	Level of investment required for an action to be realised, cost-effectiveness/value for money, and availability of resources in Jordan (noting that this might change in the long term). This helps indicate the amount of resources required to invest locally and the amount of international funding required and the financial soundness of the action.	
Score	-5	High level of investment required; resources are not available locally; low financial soundness
	-3	High level of investment required; some resources are available locally; potentially low financial soundness
	0	Low level of investment required; resources are not available locally; unclear financial soundness
	3	Low level of investment required; most resources are available locally; likely financially sound
	5	No investment required
Informed by	Long-term cost assessment estimated based on stakeholders' feedback.	

Recommendations on prioritisation and weighting

In the framework of an LTS, the criteria are not recommended to be used as a prioritisation framework. This is to avoid that that any short-term and time-specific considerations impact the selection of long-term actions over others. Rather, we recommend that each criterion is used to flag potential co-benefits or dis-benefits and their magnitude, **without inferring a total prioritisation score for any single action.**

Throughout the implementation of this roadmap, if a total score *needs* to be provided, we recommend that:

- ✓ Each criterion is weighted in a way that ensures that the final score represents the country's long-term priority. For instance, to ensure that adaptation is the main determining factor in selecting a long-term action, the adaptation impact score would weigh more than all other potential impacts (as much as all other criteria combined). In turn, mitigation, economic, social and environmental impacts would weigh equally in the action's overall impact score. This would ensure that:
 - An action that has adaptation benefits, but no mitigation benefits would not be deprioritised.
 - The adaptation score of a climate action has enough influence to ensure that actions with the potential to lead to maladaptation are not prioritised.
 - Climate actions with large adaptation benefits but requiring small increases in emissions are not de-prioritised.

- ✓ Scores for relevance and cost (the “feasibility” criteria) are not merged with the impacts score. As such, the assessment of impact and feasibility should remain separate. This is to ensure that:
 - The final impact score truly reflects the long-term vision of an LTS, as the feasibility score may be impacted by changes in available resources and development plans between 2021 and 2050
 - A highly impactful action is not de-prioritised for its large investment needs, as 30 years provide a large timeframe to source necessary resources

The resulting scoring (and, potentially, prioritising framework) may look like Table 5-9.

Table 5-9 LTS framework to rate mitigation and adaptation options against climate action criteria

Impact							Feasibility			
Climate		Economy		Society		Environment	Total impact score	Political	Financial	Total feasibility score
Adaptation benefits	Mitigation benefits	Employment	Competitiveness	Social inclusion	Gender	Ecosystems		Coherence	Costs	

5.5.5 Framework for mapping actions under the LTS, and interaction with short and medium-term planning



Although long-term strategies are not typically formulated as implementation plans, they can guide near- and medium-term implementation processes if integrated into sectoral strategies. This is typically done through short- medium-term actions which provide the ‘stepping-stones’ to the longer-term actions. To implement the above-mentioned long-term actions under each pillar of the LTS, a long list of short- and medium-term actions is required. These short- and medium-term actions might feature under the NAP, the NDC, and other national and sectoral plans.

We suggest a framework to record these actions and monitor their consistency with the LTS. The framework also allows to identify potential gaps in short and medium-term planning. It is important that actions are not only mapped to a pillar, but also that they do not hinder progress under another. Hence, it may occur that some short- and medium- term actions may need to be discontinued or reconsidered.

This framework is presented below in Table 5-10. It utilises a suggested sectoral structure for Jordan shown in Figure 5-2, derived from existing sectoral structures in plans and strategies. This approach also enables the identification of actions that span or impact multiple sectors – for instance, where energy actions also intersect with the urban environment or transport, for example, and will therefore need to be considered in other strategies and plans. Note that urban environment and Tourism are highlighted in the diagram below due to their intersection with numerous other sectors, but reflecting their treatment often as standalone sectors or through specific planning and strategy processes.

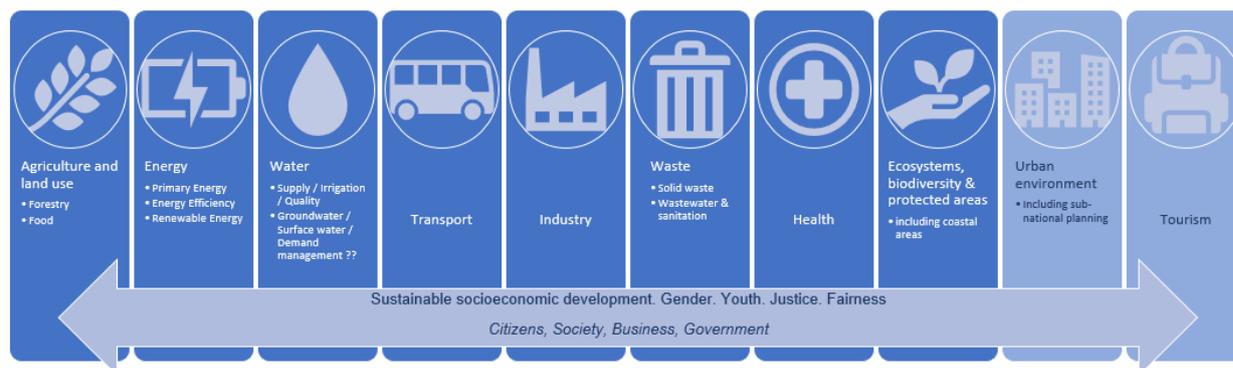


Figure 5-2: Suggested sectoral integration structure for the LTS.

Source: Developed by Ricardo Energy and Environment

When integrating into sectoral plans and policies, in addition to identifying the specific policies, means, or actions that are aligned with the LTS, the following elements could also be incorporated:

- *A desired outcome:* Where Jordan commits to a certain outcome or result, such as reducing emissions to a specific level (GHG outcome), a sectoral strategy could reflect this with a sectoral GHG outcome (derived from modelling and analysis), or generating a certain percentage of renewable energy (non-GHG outcomes with mitigation benefits).
- *Milestones to be achieved:* A SMART (specific, measurable, achievable, realistic, and timebound) indicator design for milestones can help hold decision-makers accountable for meeting the long-term goals, enhance the credibility of the process, scale up political buy-in, enhance vertical integration and collaboration from policymakers to data collectors, and draw attention to innovative local climate action, among other benefits.
- *Elaboration of how the transition will be managed:* Sectoral planning for just transitions may need to include stakeholder processes that solicit inputs from affected communities; references to the distributional effects, including effects on employment and income and the means to mitigate such effects; the definition of a successful transition, given the inevitability of both winners and losers in any major economic transition; and policies and measures.
- *Opportunities for innovation and R&D:* Innovation and R&D can help guide investments in both the public and private sectors.
- *Capacities, resources, and investment strategies:* Jordan will need identify the capacities and resources required to implement the sectoral strategy.
- *Consideration of other sectors:* A consideration of other sectors might include a description or analysis of cross-sectoral linkages, trade-offs, and prioritization. However, the 'pillars'

approach presented here for Jordan aims to ensure that these cross-sectoral linkages are embedded.

Box 5-3 COVID-19 recovery and BBB

Note on COVID-19 recovery and BBB:

When developing the LTS, the process could greatly benefit from making a strong link between short term objectives, such as those from current Build Back Better (BBB) efforts, and how these are aligned with climate change and broader development and economic growth priorities, the long term vision (section 4) and the climate pillars (section 5). A strong context section in the LTS would build the links between short term and long-term objectives and provide evidence to support the argument for climate actions. An effective LTS could suggest options to align the two and point at actions that can achieve the triple dividend of creating jobs, enhancing inclusion in the short and medium term, while strengthening long term sustainability.

5.6 Challenges and bottlenecks to consider when developing the LTS



This part of the LTS provides the detail of the strategy, and sets out Jordan's priorities and how the vision will be achieved. A large number of challenges may arise when undertaking this work, many of which will overlap with challenges elsewhere, including

- Availability of data
- Balancing competing demands and priorities of stakeholders
- Balancing adaptation, mitigation, sustainable development economic development concerns
- Subjectivity of scoring and assessing options for actions
- Determining whether actions are long- or medium-term and appropriateness for inclusion
- The need for an iterative process alongside the vulnerability and risk assessment analysis, and modelling of mitigation pathways
- Balancing the need to focus on long-term and strategic planning issues and priorities, rather than shorter term actions, and managing stakeholder understanding of this focus (for example, in relation to costs of measures and prioritisation – see Box 5-4 below on cost-benefit analysis for example).

These are all issues that will need to be overcome by the team undertaking the process, through good communication, a structured and logical approach, transparency of assumptions, and comprehensive engagement.

Additionally, some principles to consider that might be helpful to apply in the case of more nuanced challenges may include

- ✓ **Focus on the long term, the desirable, and don't get too hung up in the detail:** there are many unknowns and it won't be possible to predict every technological change and likely future impact. The LTS is about creating a vision and overarching strategy based around priorities. The shorter-term actions to achieve these can be identified, adjusted and amended in sectoral strategies and NDCs for example, so the LTS can stay 'big picture'.
- ✓ **Take decisions on the basis of vulnerabilities not on risks:** Jordan may face issues of contradictory climate projections and projections, which identify different levels of risk. This might provide, in some cases, a false sense of certainty. Decisions about future adaptation priorities should ultimately be based on the *vulnerabilities* that exist irrespective of the risks that different projections might highlight.
- ✓ **Think outside Jordan's borders too:** thinking 'outside the borders' is something that is very necessary already in Jordan. However, ensuring this extends to future climate impacts, vulnerabilities, and future markets and drivers is also important. Decision-making only on the basis of what Jordan can control and current impacts might miss opportunities and miss potential issues. Whether this be climate spill-over effects from other countries (such as water, food or humanitarian pressures) or technological development and innovation driving transformations that will trickle down.
- ✓ **Don't make decisions based on short term financing opportunities:** whilst it is tempting to identify actions that align to current international funding priorities, the LTS must fundamentally be *Jordan's LTS*, that speaks to Jordan's needs and wants and prioritises those. At present, the balance of international finance is heavily in favour of mitigation, in particular renewable energy and transport. However, the mood is shifting, and adaptation finance is becoming an increasing priority, with commitments being tabled to ensure future funding parity. The strategy must therefore ensure it accurately reflects future needs and not current opportunities.
- ✓ **Consider all sectors even if seemingly not so relevant now:** 2050 is a long way away and it is difficult to plan for. However, it is important to ensure that the LTS is comprehensive in its coverage of sectors and issues, even if not important at present. For example, energy and transport infrastructure is typically a 'mitigation' sector but will be increasingly impacted

by climate change. Ensuring the sector is also addressed from an adaptation lens will be necessary.

Box 5-4 Cost-benefit analysis in long-term planning process

Note on cost criteria:

Cost-benefit analysis of climate measures is an often-used tool to help prioritise financing and implementation (in NDC implementation planning, for example), to ensure that expenditure delivers maximum benefits and to target efforts. Although the suggested action criteria above includes a cost dimension, it is *not recommended* that any cost-benefit analysis (CBA) is undertaken at the LTS development stage. This might be considered an unexpected recommendation when considering its utility in other strategies and climate policies and the NDC process. However, CBA is not recommended in an LTS process for two main reasons:

CBA is not relevant to the long-term dimension

The aim of an LTS is to (i) provide a long-term Vision for climate resilient development and (ii) to devise a pathway to achieve this Vision. This roadmap sets out an approach utilising several exhaustive “pillars” and/or principles and argues that they should *all* be implemented to fully achieve the Vision. Therefore, any estimation of the cost (and benefits) of this pathway may be harmful to the implementation of the LTS as it would:

- Distract investment from key long-term actions based on short-term concerns, potentially hindering Jordan from fully achieving its vision.
- Threaten the relevance of the LTS for the long-term where the cost-benefit analysis will have been realised in the first year, despite:
 - o costs and benefits that may change over time
 - o the availability of funding and international donor priorities that may change over time

CBA is not possible within the framework set out in this roadmap

An LTS is not intended to be an implementation plan to achieve a Vision. Rather, the approach set out in this roadmap utilises “pillars” to provide a ‘compass’, to ensure that short- and medium-term plans and actions contribute to achieving the Vision through complying with and aligning to the “pillars”. It is *through* these plans that the LTS’ Vision will be achieved.

Hence an LTS is *not expected to be detailed enough to assess what the exact costs and benefits of these actions would be*. Instead, short- and medium-term plans should be required to define the costs and benefits of their actions in relation to their contribution to the pillars. It is therefore recommended that CBA processes are continued to be conducted at the level of these plans instead.

PART B: PROCESSES TO DEVELOP AND IMPLEMENT THE LTS

This final section of the roadmap sets out the key processes and implementation steps for undertaking the development of Jordan's long-term strategy.

This section of the roadmap outlines the key content elements of the LTS, outlining the Jordanian context for each of the elements, and proposing an approach to each.

Navigation



Section 6: Institutional and Governance Arrangements

Provides an overview of the role of institutional and governance arrangements, international examples and provides a framework for the key structures and functions that might support the LTS development process and ongoing management.

It identifies specific roles and responsibilities and alignment/integration with existing governance and management structures in Jordan.

This section is supported by:

- **Annex 5** which contains further details on institutional and governance arrangements
- **Annex 8** which contains information regarding MRV for LTSs.

Section 7: Citizen Engagement

Provides an overview of the need for citizen engagement, international examples and existing citizen engagement activities in Jordan.

It outlines possible engagement approaches and their suitability for different elements of the LTS development process.

This section is supported by **Annex 6** which contains further details.

Section 8: Stakeholder Engagement

Provides a summary of the stakeholders of relevance to the LTS and suggested approaches for their engagement.

This section is supported by **Annex 9** which contains a suggested stakeholder engagement plan.

Section 9: Implementation of the Roadmap

This section outlines the key steps for the development of the LTS. It includes:

- Key steps for developing the LTS
- An indicative timeline for LTS development
- Indicative resource needs for select LTS elements

This section is supported by **Annex 8** which details MRV system for tracking the implementation of the LTS.

Opportunities for Gender Mainstreaming

Gender has been considered throughout this report, but we provide a separate document, **Annex 7**, on opportunities for gender mainstreaming

6 Institutional and governance arrangements

Long term climate planning requires an effective governance system, as decisions made today have a magnitude of effects in the long term. Long-term planning for climate adaptation and mitigation therefore requires the establishment of governance and institutional arrangements. This section describes institutional and governance arrangements to develop the LTS as well as to implement it.

See Annex 5 for more detailed review and analysis of institutional and governance arrangements

Navigation

Regarding the “Institutional and governance arrangements” element of the LTS, this section provides:



- **[Role of institutional and governance arrangements](#)**
 - o A description of the role that this element plays in the LTS development and implementation
- **[International examples](#)**
 - o Examples of how what this element contains in other LTSs
- **[Framework for Jordan’s institutional and governance arrangements: what might be needed?](#)**
 - o A framework or approach to how this element may be presented and implemented in Jordan’s LTS and development process, and what it might include
- **[Information to develop Jordan’s institutional and governance arrangements: existing structures and functions](#)**
 - o Core information relevant to the content of this element for Jordan
- **[Recommendations for Jordan’s institutional and governance arrangements for the LTS development](#)**
 - o A summary of recommendations for developing and implementing this element in Jordan’s LTS
- **[Challenges and bottlenecks](#)**
 - o Potential challenges and bottlenecks to consider when developing this section.

This section is supported by:

- **Annex 5** which contains further details on institutional and governance arrangements
- **Annex 8** which contains information regarding MRV for LTSs.

6.1 Role of institutional and governance arrangements

Institutional and governance arrangements are a critical component for both the effective development of the LTS, its implementation via mainstreaming into other domestic policies and strategies, and for ongoing management of the process and future updates. Ensuring it is ‘owned’ and embedded, with clear roles and responsibilities identified will ensure the



LTS has longevity and is taken up effectively across ministries, departments, agencies and other stakeholders. The diagram in Figure 6-1 below shows some of the key governance considerations of LTSs and their relevance to the Jordan LTS process.

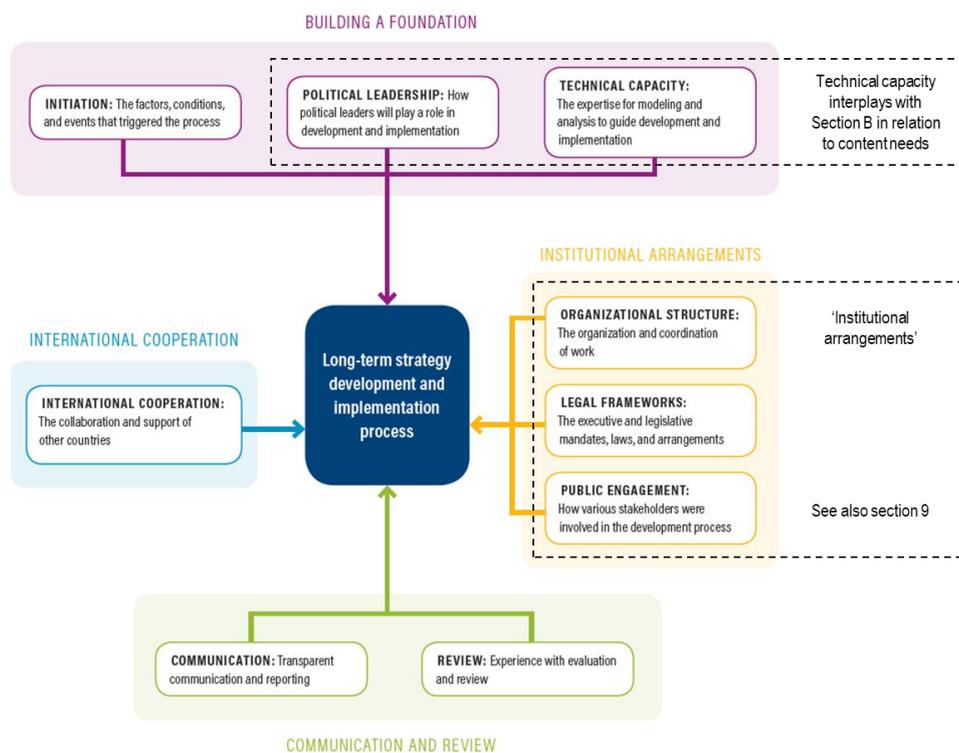


Figure 6-1: Governance Considerations of Long-Term Strategies,

Source: Adapted from WRI (2019)⁸¹

⁸¹ WRI (2019), 'Good governance for long-term low-emissions development strategies', <https://www.wri.org/publication/good-governance-long-term-low-emissions-development-strategies>

What does ‘institutional and governance arrangements’ mean?

Institutional arrangements and governance describe the organizations, mandates and processes in place to support the country’s climate response. These might include:

- Collecting and analysing data to assess impacts, understand and secure appropriate action
- Designing and implementing action to address climate change, at national and sectoral level
- Monitoring and evaluation, and reporting processes
- Decision-making, planning, coordination
- Addressing of cross-cutting issues, adjustment of priorities and activities
- Consultation, participation and implementation
- Legal and policy frameworks and regulations^a

Governance is broadly defined as the exercise of economic, political and administrative authority to manage a country’s affairs, comprising the mechanisms, processes and institutions. **Institutional arrangements**, on the other hand, both formal and informal, are the structures that exist or are put in place to ensure accountability and transparency in governance, including standing committees, statutory bodies, internal and external audit requirements in individual government agencies, citizens’ forums and so on.^b

Well-functioning institutional arrangements are flexible and sustainable, and they facilitate a consistent and continuous flow of data, engage national and subnational expertise, ensure coordination between institutions, and drive recurring, engaging and continuously improving outputs.

^a Adapted from “Handbook on institutional arrangements to support MRV/transparency of climate action and support”, Consultative Group of Experts, United Nations Framework Convention on Climate Change secretariat June 2020
https://unfccc.int/sites/default/files/resource/Hand%20book_EN.pdf

^b Adapted from World Economic and Social Survey 2014/2015 https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/2015wess_ch6_en.pdf

Box 6-1: What does institutional and governance arrangements mean?



6.2 International examples

Countries’ governance structures bridge the decisions of today to the long-term climate implications. This raises multifaceted governance challenges, which may require high-level political leadership, engagement across a wide range of ministries and stakeholders, and supportive legal frameworks.

It is useful to draw inspiration from country examples and guidance on existing institutional arrangements and governance elements, such as the World Resources Institute (WRI) who have explored some key principles to consider when developing an LTS, including⁸²:

- Institutional framework
- Political leadership
- Technical capacity
- Legal frameworks
- Stakeholder engagement

6.2.1 Institutional framework

LTSs require a high level of intragovernmental cooperation across a variety of actors and institutions, at multi-levels and branches of government. **It is crucial to foster a cross-governmental approach when planning an LTS to maximise available in-country resources⁸³.** This approach will encompass the participation and coordination across several branches of government, institutions,

⁸² WRI (2019), ‘Good governance for long-term low-emissions development strategies’, <https://www.wri.org/publication/good-governance-long-term-low-emissions-development-strategies>

⁸³ OECD (2019) Key questions guiding the process of setting up long-term low-emission development strategies, <https://www.oecd.org/environment/cc/Key-questions-guiding-the-process-of-setting-up-long-term-low-emissions-development-strategies.pdf>

and ministries e.g. the Ministries of Environment, Planning, Energy, Local Administration, Transport, Water and Irrigation, Agriculture, and Finance, and the Greater Amman Municipality, for example.⁸⁴ It's important to note this list is not exhaustive and may include a broad range of other state and non-state actors, in particular sub-national governments. In practice, this presents many coordination challenges, where Ministries may be competing for the same budget or pushing for different priorities, for example, hence a cooperative and cross-governmental approach is needed.

Institutional arrangements differ between countries and should be country specific. Some countries have built on existing structures and some have developed new structures, summarised in Table 6-1 below⁸⁵.

The approach is dependent on the context of the country and how well-developed existing governance structures were before developing an LTS – for example, for NDCs or national climate policy development. This could be a key consideration for Jordan when deciding whether the existing governance structures are sufficient, or if the LTS development process could provide an opportunity to enhance institutional arrangements.

Key learnings from county case studies suggest that building on existing arrangements can promote credibility, ensure priorities set by the LTS are consistent with sector-specific conditions, and preserve capacity.

⁸⁴ GIZ (2020), 'Making Long-Term Low GHG Emissions Development Strategies a Reality', https://newclimate.org/wp-content/uploads/2020/05/GIZ_NewClimate_LTS_GuideForPolicyMakers_2020.pdf

⁸⁵ WRI (2019), 'Good governance for long-term low-emissions development strategies', <https://www.wri.org/publication/good-governance-long-term-low-emissions-development-strategies>

Table 6-1: Comparison of approaches to institutional arrangements

LTS built upon existing institutional arrangements	LTS provided an opportunity to organise new structures	LTS utilised informal or hybrid arrangements
<p>United States, Mexico, France, Germany, United Kingdom</p> <p>Governmental structures were developed through former cross-governmental efforts to establish particular climate policies, laws, or strategies.</p>	<p>Malta, Burkina Faso</p> <p>New Structures developed to bring together stakeholders via specific committees or groups, or creation of a completely new entity established by a new law that subsumed multiple entities into one (Malta).</p>	<p>South Africa, Costa Rica</p> <p>Ad hoc multi-stakeholder teams formed to focusing on management, research, technical advice, and facilitation (South Africa) or developed without a formalized set of arrangements or coordinating body (Costa Rica).</p>
<p>Efficient in preserving technical capacity across the governmental structure, builds on existing arrangements and can create opportunities to develop synergies within the existing divisions.</p> <p>Using existing independent committees provides independent assessments of strategies and evaluation of progress, visibility and credibility (UK, Mexico).</p>	<p>Provides an opportunity to form a new cross-cutting coordinating body and overcome previous fragmented and conflicting processes or entities - defining a new structure, function, and mission to better develop synergies, policy integration, and a cross-sectoral approach to long-term planning (Malta).</p>	<p>Brings together the necessary expertise quickly and efficiently to deliver the required outputs (South Africa).</p> <p>Where there was no legal mandate to develop the plan, some sectors sought to be exempted from the plan (Costa Rica).</p>

Institutional structures vary between countries and there is no one size fits all approach. However, there are some recommended common elements⁸⁶. This includes:

- ✓ **Government/political leadership.** Setting the development of the LTS as a priority for the country, highlighting the broad scope and links between the LTS and multiple national objectives.
- ✓ **An independent public committee, body, or task force to coordinate the implementation of the LTS.** An independent entity would ensure active engagement both horizontally, across all ministries and divisions and, vertically, across national, sub-national, city and local levels.
- ✓ **Technical support to the committee via a task force and technical working groups.** The development of the LTS will specialist knowledge and experience on, for example, mitigation pathways and adaptation options. Coordination of technical work via a technical body or task force is a common approach.
- ✓ **Strong stakeholder consultation and engagement processes spanning LTS development and implementation.** Robust and transparent stakeholder engagement can include collaborating across a very wide range of actors, including government agencies and engaging with scientists, businesses, civil society, and the public.

6.2.2 Political leadership

Several countries who have submitted LTSs have stressed the importance of high-level, visible political leadership in mobilising government actors, establishing technical bodies, and raising public

⁸⁶ OECD (2019) Key questions guiding the process of setting up long-term low-emission development strategies, <https://www.oecd.org/environment/cc/Key-questions-guiding-the-process-of-setting-up-long-term-low-emissions-development-strategies.pdf>

awareness. Countries who have high-level political endorsement include for example, Canada and Mexico, where the prime minister and president led the development of the long-term strategies, strengthening political recognition. In Costa Rica, New Zealand, and Sweden, the heads of states provided strong mandates for the development of long-term strategies.

Generally, high-level leadership is derived from parliamentary roles, that can establish subcommittees.⁸⁷ Additionally, parliament can pass laws requiring long-term plans and approve budgetary resources needed for implementing policies. This leadership can be supported by ministries, who lead on implementing the LTS via sector-specific policies and actions. See Figure 6-2 for the different levels of political involvement throughout the lifetime of an LTS.

Supportive and strong leadership is pivotal in launching the LTS process, as it can provide the necessary direction to ensure the process involves multi-levels of government. It is essential to gain political buy-in, from the offset.



Figure 6-2 Political leadership during the development of the an LTS

Source: Developed by Ricardo Energy and Environment

6.2.3 Technical capacity

Technical capacity is at the heart of the LTS, as its development demands high levels of technical know-how to produce, for instance, models and forecasts to feed into mitigation and adaptation pathways. This technical leadership may come from state actors (e.g. line ministries and agencies) or non-state actors (e.g. sector-specific groups, academic institutions, think tanks, NGOs, and international experts including consultants). Co-ordination of key actors requires good governance to engage with a wide range of groups to support the LTS across all sectors. A lack of good governance and structures to integrate technical actors can run the risk of bad data control, lack of transparency, and restricted data information flows. A leading entity is required to set out a process or build on existing processes, such as robust QA checks and consistent data handling. Not only does this provide a strong foundation for the LTS to deliver high-quality data sets for emission pathways but adds credibility to the LTS pathways on a national and international stage.

Four (plus an additional suggested 5th) common features are important for building and sustaining this technical capacity for LTSs⁸⁸:

1. **Durable institutions:** Capacity is sustained by housing researchers in durable institutions that allow researchers sufficient time to develop experience. National laboratories, scientific societies, research institutions, or universities can play such a role.
2. **Sustained financial support:** A stable supply of funding can sustain analytical capacity and continual support for development and improvement.
3. **Analysis, interpretation and application:** Technical capacity not only depends on the capacity to undertake the analysis itself, but also the capacity and willingness to interpret and use results for policymaking.

⁸⁷ OECD (2020), Long-term low emissions development strategies. Cross-country experience, https://www.oecd-ilibrary.org/environment/long-term-low-emissions-development-strategies_1c1d8005-en

⁸⁸ WRI (2019), Good governance for long-term low-emissions development strategies, <https://www.wri.org/publication/good-governance-long-term-low-emissions-development-strategies>

4. **International engagement:** Countries with little current analytical experience, as well as those with substantial analytical capacity, may benefit from participating in international modelling and analysis activities as a means of continuing to learn and build capacity.
5. **Practice makes perfect:** *Building technical capacity to undertake an LTS will grow over time and with practice. For instance, countries with a longer history of decarbonisation pathways modelling and participation in other deep decarbonisation projects, have found the modelling experience influential in their LTS development.*

Ensuring the key 'in house' technical departments, agencies, non-government entities and individuals who contribute or could contribute to the LTS technical elements, have a clear and formalised role will help to ensure the embedding of individuals for longevity of technical knowledge and skills in Jordan.

6.2.4 Legal frameworks

Some countries have utilised recently passed laws to mandate institutional arrangements (e.g. France, Mexico, and the United Kingdom), including creating new institutions or coordinating structures, stakeholder and public engagement modalities, technical capacity development, and monitoring and evaluation functions in addition to setting long-term climate goals. While some countries have accomplished this without a new law, having a legal framework can provide clarity of goals, responsibilities, timelines, and help to transcend political changes and ensure long term planning. Having a legal basis for the LTS can induce action in ways a non-legally binding policies cannot. For instance, it can encourage a review of organisational decisions, clarification of roles and responsibilities, establishment of processes or strengthening of capacities. Outside of government, it also sends signals about future intentions to business and the public. Examples include the Mexico General Climate Change Law (2012) which mandated the development of a climate change strategy, and the French 2015 Act on the Ecological Transition and Green Growth.

A new executive decree could provide a powerful mandate for Jordan to define roles and responsibilities and enhance connectivity between previous climate plans on a sectoral level.

6.2.5 Stakeholder and public engagement

The final element of good governance relates to stakeholder and public engagement. Whilst addressed in section 0, it is important to note that stakeholder engagement is a key element of governance, and undertaking this throughout the LTS development will result in a more robust and transparent strategy. Comprehensive engagement includes collaborating with various actors, such as government agencies, the public, scientists, businesses, and vulnerable groups. It is commonly cited in literature that one of the challenges associated with LTS engagement is the lack of communication vertically and horizontally between state and non-state actors. This poses risks for governments as some actors may be duplicating efforts. Clear communication can yield benefits including, well-informed decision-making, identifying where overlaps occur and transfer of knowledge.

Varying approaches have been adopted internationally. Fiji⁸⁹ has held three National stakeholder consultation workshops in the development of their LTS. A wide range of stakeholders provided feedback on proposed plans. Germany developed a bottom-up approach, randomly selecting 500 citizens to discuss the proposed Climate Action Plan⁹⁰. To ensure ideas and views are shared freely in an open environment, it may be useful to set up bilateral stakeholder sessions alongside multi-stakeholder sessions. This ensures stakeholders are comfortable in sharing sensitive issues. An example of this is South Africa, where stakeholder consultations were held under Chatham House Rules⁹¹.

⁸⁹ OECD (2020), Long-term low emissions development strategies. Cross-country experience, https://www.oecd-ilibrary.org/environment/long-term-low-emissions-development-strategies_1c1d8005-en

⁹⁰ Ibid.

⁹¹ Government of South Africa (2020), "Low Emission Development Strategy": <https://unfccc.int/sites/default/files/resource/South%20Africa%27s%20Low%20Emission%20Development%20Strategy.pdf>

It is key to conduct consistent stakeholder engagement throughout all stages of the LTS. This will increase public acceptance of the strategy as problematic decisions like transitions that may affect a sector or proportion of businesses adversely. This ensures that difficult decisions are made openly and transparently. Public engagement is the foundations of good governance and can mandate better decision-making outcomes for those affected (WRI, 2020)⁹².

6.3 Framework for Jordan’s institutional and governance arrangements: what might be needed?



From the above principles of good governance and country examples, the following key components for effective LTS governance can be identified:

Table 6-2: Components of effective LTS governance

Entity	Role	Relationship
National Government	Political leadership	Important for initiation of the LTS process, leadership, and ensuring it has due emphasis and visibility at the highest level
Parliament	Can establish subcommittees to put climate planning on the policy agenda or to pass laws requiring long-term plans and to approve budgetary resources required for implementing the policies and plans.	Important for political buy in of LTS goals and country ownership; providing the legal mandate or requirement to act; ensuring the provision of resources and delegation of responsibilities
Inter-ministerial Committee	Oversight and management of the LTS development process. Post-development, provides the enabling environment for priority actions. Acts as executing body for projects and programmes. Provides support and advice to the project. Provide co-financing to projects and programmes	Important for country ownership; overseeing the process; ensuring alignment with existing country plans and strategies
Technical Task Force / Technical agency	A technical public body or group that provides substantial technical inputs and coordination of the LTS. Effectively the ‘technical lead’ tasked with the development, and ongoing monitoring of implementation and future updating. A designated agency within the Ministry of Environment / Climate Change Directorate (or an external agency), but should be a durable institution.	Important to ensure active engagement both horizontally, across all ministries and divisions and, vertically, across national, sub-national, city and local levels; also important for coordinating the necessary technical inputs and processes and keeping these updated.
Working Group(s)	Technical teams formed for the development of key technical inputs to the LTS development e.g. for mitigation pathways, modelling, climate scenarios, vulnerability & risk assessments, public engagement etc. Post-development, act as an executing body for projects and programmes. Provide support and advice to projects.	Lead on the technical inputs to the LTS process including e.g. mitigation modelling, like risk assessment, action identification. Support the implementation of actions with stakeholders.

⁹² WRI (2019), Good governance for long-term low-emissions development strategies, <https://www.wri.org/publication/good-governance-long-term-low-emissions-development-strategies>

Stakeholders and citizens	<p>Inform the development process to ensure incorporation of existing strategic priorities, goals and actions, and shaping future priorities.</p> <p>Should be included as part of a representative panel in ongoing monitoring and implementation of the LTS.</p> <p>Implement the actions identified in the LTS.</p>	<p>Important for ensuring the LTS is inclusive, and is integrated into country plans, policies, and strategies, and responses by government and non-government actors including private sector entities. Important to engage in order to ensure the LTS is understood and supported in order to implement actions.</p>
Independent committee or scientific panel	<p>An independent expert panel or committee of scientists and experts drawn from across government and non-government bodies e.g. academia, research groups, think tanks, scientific associations.</p> <p>Provides quality assurance of the LTS; objectively assess progress through e.g. annual performance reviews and reports; provide recommendations to enhance or adjust actions or policies, and recommendations for future updates.</p>	<p>An independent scientific body important for ensuring the integrity of the strategy, holding the implementers to account and ensuring it is fit for purpose and responds to the latest science.</p>

6.4 Information to develop Jordan’s institutional and governance arrangements: existing structures and functions



International experiences provide insights into the governance needs and considerations for Jordan’s LTS but building on existing institutional and governance arrangements is preferable for providing credibility, familiarity and enhancing buy-in to the process, retaining knowledge, maximising efficiencies, and ensuring consistency with sectoral strategies and other climate reporting.

6.4.1 Jordan’s institutions and structures

The Ministry of Environment was established in 2003 to oversee all environmental affairs. Since then the country has witnessed a steady expansion of the legal and institutional framework for environmental protection. The Ministry of Environment is the UNFCCC focal point and is primarily responsible for overseeing the policy and legal frameworks that guide climate change mitigation and adaptation efforts of the country, including the development of the National Communications and BURs to the United Nations Framework Convention on Climate Change (UNFCCC) and the Nationally Determined Contributions (NDCs).

The National Climate Change Committee (see below), established in 2001 by decision of the prime minister, is mandated to monitor the progress in the implementation of the Climate Change Policy on the national level and the INDC (and the updated NDC once submitted). A large share of the objectives of the Policy are intended to be implemented through sector strategies under the responsibility of the sector’s ministries (energy, water, agriculture, health, and others). Their progress will be monitored by each involved sector on the basis of the specific monitoring framework adopted in the respective sector’s policies and strategies.

The Directorate of Climate Change (CCD) was established in August 2014. The Directorate acts as the institutional hub for coordinating all climate change activities in Jordan in relation to the UNFCCC. The core responsibility of the CCD is to reach out to stakeholders to develop actions for climate response and to incorporate the resulting policies into executive decision-making.

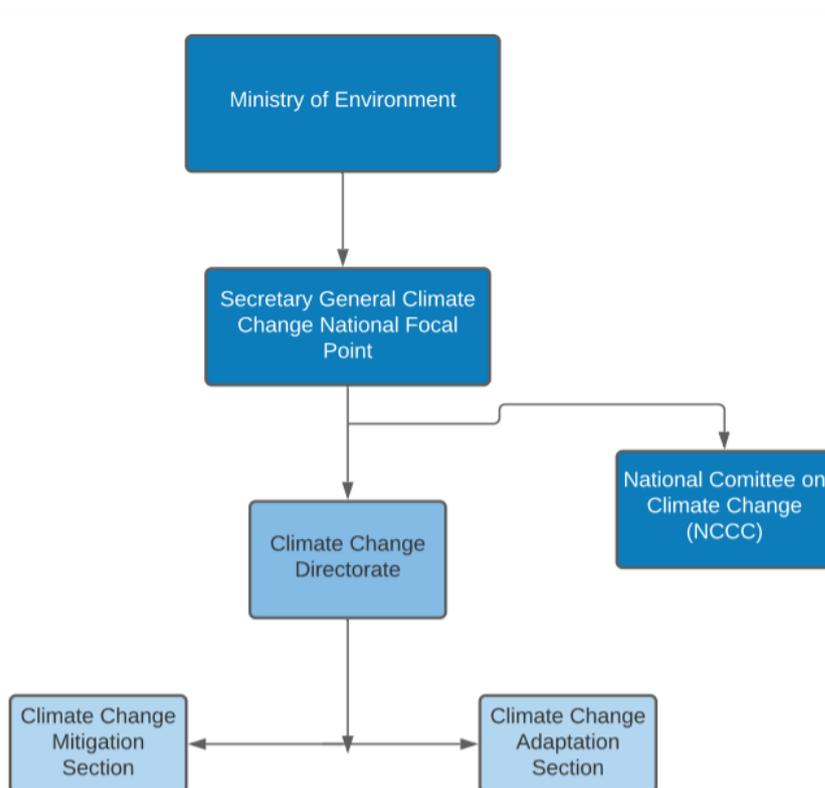


Figure 6-3: Jordan's Institutional framework for climate change

Source: Developed by Ricardo Energy and Environment

6.4.2 Jordan's climate policies and laws

The National Climate Change Policy (2013-2020) was issued in 2013 and provides guidance to sector strategies from a climate change perspective and provides a framework for coordination of climate change activities at the national level.

The Climate Change Bylaw: Based on the recommendations of the National Climate Change Policy, the Ministry of Environment revised the Environment Protection Law, no. 52 of 2006 to add new articles related to climate change and strengthen the existing articles. The new Environment Protection Law no.6 of year 2017, included provisions on climate change goals which later enabled the ministry to develop the Climate Change Regulation No.79, 2019 (the 'Climate Change bylaw').

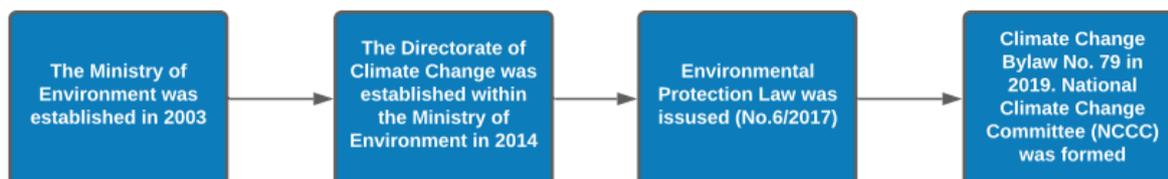


Figure 6-4 Jordan's governance timeline

Source: Developed by Ricardo Energy and Environment

6.4.3 Jordan's climate change institutional arrangements

The climate change bylaw came as a response to the need to define a framework that establishes a clear institutional setting to address climate change challenges and ensure full engagement of all partners and stakeholders including both the technical experts and the decision makers. The climate change bylaw aims to regulate:

- (a) the coordination of national efforts among relevant stakeholders to implement mitigation and adaptation measures
- (b) the development of a legislative framework that maps out plans to combat climate change in the Kingdom and ways to implement them
- (c) the streaming of climate change into national plans and the implementation of the goals and principles of the UNFCCC and the Paris Agreement.

According to the bylaw, the National Committee on Climate Change" (NCCC) which is chaired by the Minister of Environment and consists of 16 high-level members from relevant public authorities (shown in Figure 6-5 – Interministerial Committee), including the secretary generals. As before, this is the highest coordination body for climate policy, but the bylaw mandated that bodies participating in the NCCC be represented at a higher level. It brings together stakeholders from different sectors, including several ministries, and partners from civil society, the private sector, and academia.

The NCCC's functions and powers are identified within the bylaw, including the power to form technical teams from governmental and non-governmental agencies represented by civil society institutions, research institutions, universities and the private sector institutions. These teams are nominated according to specific needs from the identified organisations but are not a permanent set of individuals. The teams are mainly tasked with supporting the Ministry of Environment with the NDC, the National Adaptation Plan and any other reports that should be prepared within Jordan's international commitments and assessing the capacity-building needs of relevant entities related to climate change and contributing to the implementation of awareness-raising and capacity-building activities.

The bylaw also set a group of entities mandated to support the Ministry of Environment with providing data, available at their entities, needed for GHG inventory estimation, NDCs and financial support tracking.

The NCCC therefore plays the main role in supervising the implementation of Jordanian climate policy. Several other entities also work on environment and climate change, such as the Meteorology Department, the Royal Scientific Society, the Royal Department for Environment Protection and the Greater Amman Municipality, the Aqaba Special Economic Zone, the Jordan Environment Society, the National Centre for Agricultural Research and Extension, the Department of Vehicle Licensing and the Jordan Women National Council.

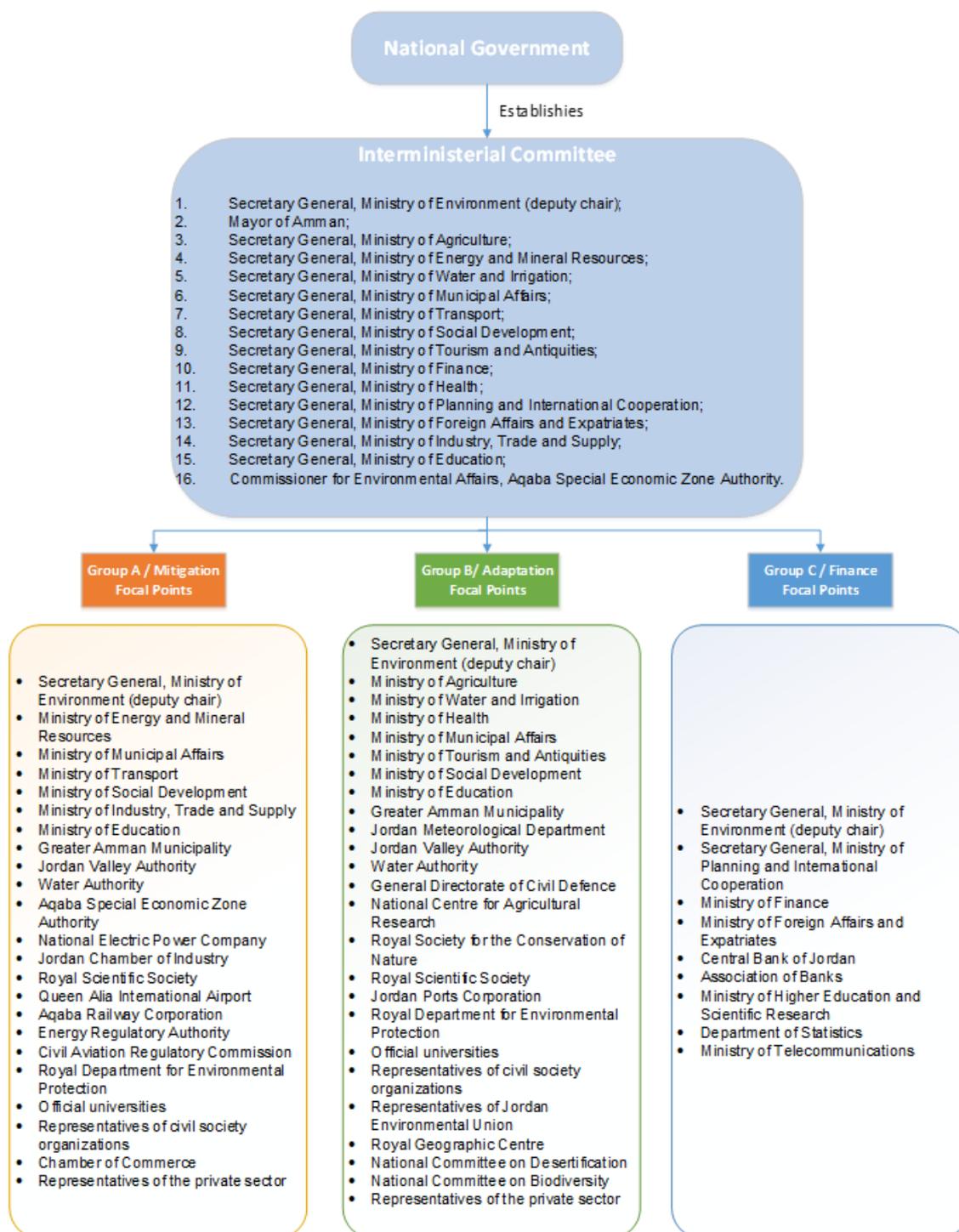




Figure 6-5: National Climate Change Committee

Source: Developed by Ricardo Energy and Environment

Specific institutional structures have also been implemented in the preparation of, for instance, Jordan's first BUR. This was coordinated by the Ministry of Environment in partnership with UNDP, and an agreement with the Royal Scientific Society (a national non-governmental, not-for-profit organization for applied research). The GHG inventory development was accomplished with the participation of a pool of national experts representing different national entities, as demonstrated by the organizational chart in Figure 6-6. Analysis has identified that Jordan's climate response studies and reports seem to be largely funded and coordinated by Western or multilateral aid donors, rather than developed 'in house' utilising the governance structures identified above. Jordan should seek to support the process at the national level and tasks should be arranged on continuous basis.

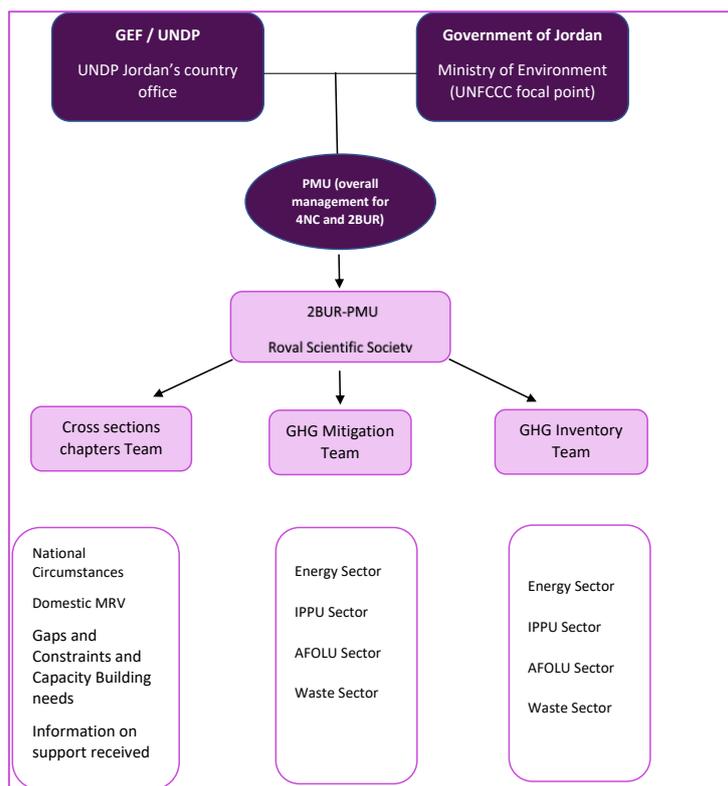


Figure 6-6: Jordan's Second Biennial Update Report institutional arrangements

Source: Developed by Ricardo Energy and Environment

At the national level many institutions have made progress in including climate change in their entities mandates. For example, many national institutions have established climate change directorates or units to follow up with the Ministry of Environment, such as the ministries of Agriculture, Water and Irrigation, Transport, The National Agriculture Research Centre, and The Royal Jordanian Geographic Centre.

Also, recently the Ministry of Environment signed an agreement with King Abdullah II Centre for Excellence to update the Environment Sustainability Award for industries to enhance their commitments towards environment protection including the reduction of GHGs.

The private sector is also engaging, with a unit for energy and environmental sustainability established in Jordan Chamber of Industry, through which they work with the industries and the government to encourage low emission technologies.

Sector strategies are also increasingly mainstreaming climate change, including the National Energy Strategy 2020-2030 (aims to reduce the emissions by 10% by 2030) and the Agriculture Development National Strategy 2020-2025 focused on adaptation and the impacts of climate change on biodiversity and land degradation. At the city level, Greater Amman Municipality in cooperation with Ministry of Environment and World Bank launched in 2018 “Amman Climate Plan - A Vision for 2050 Amman” (40% reduction of greenhouse gas emissions by 2030 and net zero by 2050).

However, there are some significant limitations that the country faces – outlined in ‘challenges and bottlenecks’.

6.5 Recommendations for Jordan's institutional and governance arrangements for the LTS development

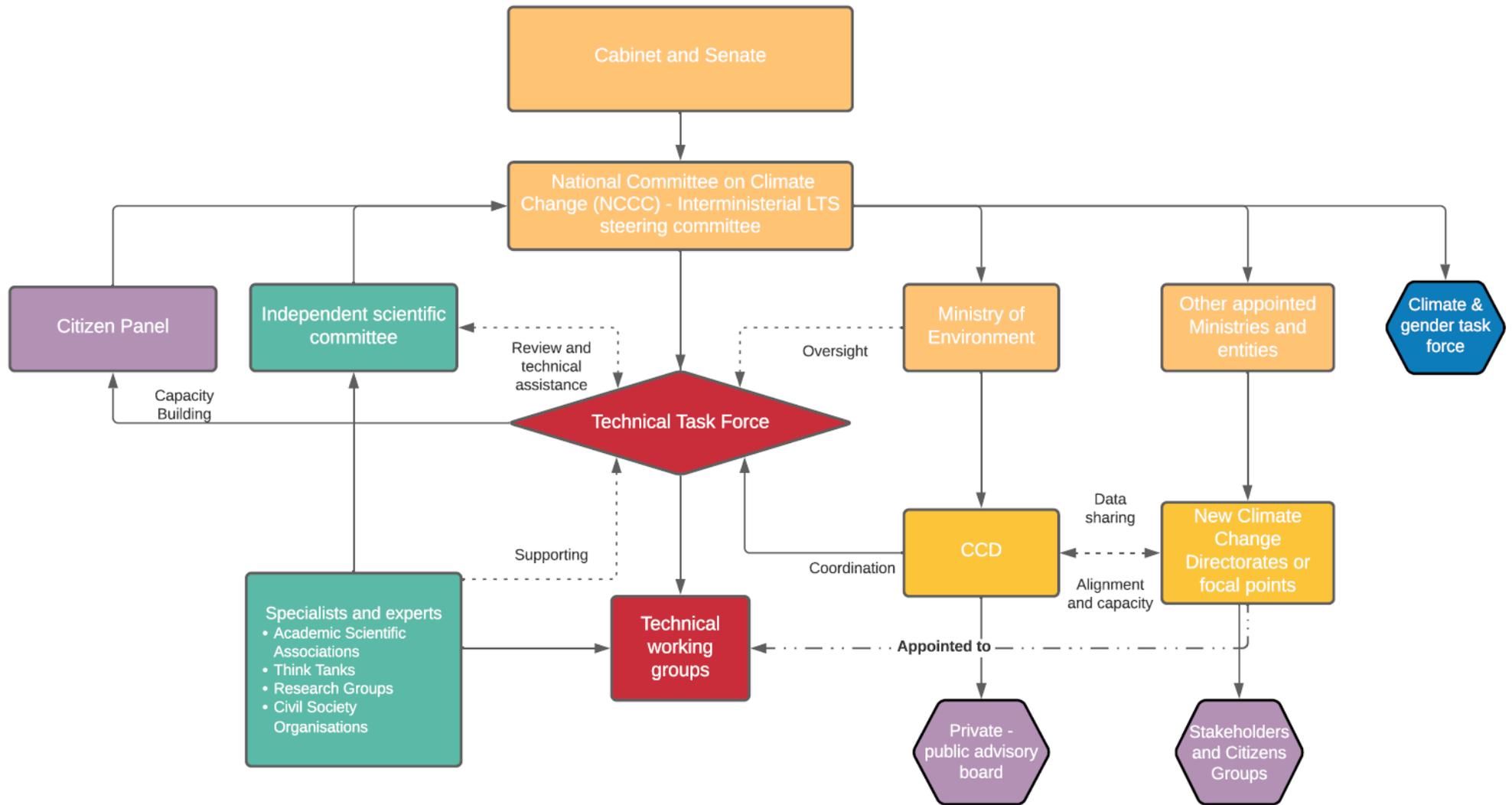


Reflecting on the existing structures, international good practices and current limitations, set out above, this section provides recommendations for Jordan's LTS governance and institutional structure.

6.5.1 Suggested Institutional Arrangements

This suggested governance and institutional framework is **based on existing climate change structures within Jordan and has reflected on good governance principles in addition to Ricardo's experience with other LTS development processes**. This suggested framework includes the addition of new entities as well as how Jordan can enhance their existing structure. This section details who should be involved in the LTS process, what their role should be, and how they should participate. The proposed draft is also accompanied with a narrative to explain the rationale and a proposed "organogram" (Figure 6-7).

Figure 6-7 Jordan's suggested LTS institutional arrangement



Source: Developed by Ricardo Energy and Environment

Table 6-3 Suggested Institutional Arrangements

Role	Potential lead or representative(s)	Suggested responsibilities	How they could participate in the LTS
Political	Representatives & Senates	<ul style="list-style-type: none"> Can establish subcommittees to put climate planning on the policy agenda or to pass laws requiring long-term plans and to approve budgetary resources required for implementing the policies and plans. 	<ul style="list-style-type: none"> Providing political mandate Engaged via Ministers
Inter-ministerial LTS Steering Committee	<p>Integrated with the National Climate Change Committee members (16 ministries)</p> <p>(a sub-committee formed from this)</p>	<ul style="list-style-type: none"> Maintains communication with policy makers/decision takers and government. Oversight and management of the LTS development process. Evaluates implementation of legislation and can propose essential new climate change legislation e.g. propose LTS climate change legislation on the basis of national priorities and international obligations Responsible for the update of the LTS and alignment to other climate strategies and reports e.g. NDC Post-development of the LTS, provides the enabling environment for priority actions. Acts as executing body for projects and programmes. Provides support and advice to the projects. Approves co-financing to projects and programmes. Approves sectoral actions plans 	<ul style="list-style-type: none"> Oversee the LTS process via regular meetings Approve stakeholders and experts to participate – e.g. form technical teams from governmental and non-governmental agencies, nominated according to specific needs Provide the mandate and approvals necessary for developing and approving the LTS Ensure alignment with existing country plans and strategies e.g. adopting LTS principles and goals in sector strategies
Technical task force or technical institution	<p>A technical public body or group that provides substantial technical inputs and coordination of the LTS.</p> <p>Could be a designated unit within the Ministry of Environment or operate as an external institution</p> <p>Individual members are appointed for a minimum of 3 years</p>	<ul style="list-style-type: none"> The 'technical lead' tasked with the development, and ongoing monitoring of implementation and future updating Engage with representatives of all ministries via ministry CCDs (see below) Coordinate the mitigation and adaption emission pathways as part of the LTS and submit these to the committee for approval Approve the results of national studies and research into climate change and include these in the LTS Approve action plans and sectoral mitigation and adaptation programmes to ensure integrated action with stakeholders Ensure linkages with the NDC and national climate policy Coordinates municipalities, governorate councils and local councils to align climate change mitigation and adaptation concepts and measures between the LTS and local development plans (via focal points at the Ministry of Municipal Affairs) <p><i>Option: Could also incorporate the independent scientific panel/committee if operating as an external institution in order to maximise skills and capacity in country</i></p>	<ul style="list-style-type: none"> Day-to-day management and coordination of all LTS work streams Call upon relevant technical experts to support activities and form technical working groups as needed to inform decision-making. Coordinate and manage the inputs of the technical working groups Compile and update LTS documentation Provide briefings and progress reports to the scientific committee and steering committee and attend meetings to report on progress Coordination of stakeholder inputs Provide progress updates to CCD for monitoring and reporting

<p>Chair and coordinator of the technical task force</p>	<p>Ministry of Environment, Climate Change Directorate</p>	<ul style="list-style-type: none"> • The institutional hub for coordinating all climate change activities in Jordan in relation to the UNFCCC. • Responsible for reaching out to stakeholders to develop actions for climate response and to incorporate the resulting policies into executive decision-making. • Identifying the outline of the existing institutional framework for mitigation and adaptation measures. • Coordinating and supporting climate change mainstreaming in sectoral action plans. • Coordinate with stakeholders to elaborate a national climate finance plan for the LTS, identifying priority projects, programmes, and plans. • Create and manage a national database to document emissions data, mitigation and adaptation measures and climate finance data 	<ul style="list-style-type: none"> • Represent the Technical Task force or institution to the LTS steering committee and other relevant climate committees and activities • Coordinate the work plan of the Technical task force • Coordinate with stakeholders • Provide technical support to other ministry climate change directorate/focal points • Lead on monitoring and reporting
<p>Technical Working Groups</p>	<p>Members of Ministry CCDs and other expert organisations</p>	<ul style="list-style-type: none"> • Groups of government and non-government experts formed to provide technical inputs on elements of the LTS including <ul style="list-style-type: none"> ○ Analysing of the potential national response measures to abate the increase in GHG emissions. ○ Identifying the key sources of GHG emissions and the projected future development of emissions from each source ○ Assessing climate risks and vulnerabilities ○ Sector action plans / mainstreaming climate ○ Local government climate action • Advisory groups on e.g. stakeholder and citizen engagement, women and vulnerable groups etc • Provide the linkage to other technical work areas in Jordan such as the GHG inventory and BUR reporting etc 	<ul style="list-style-type: none"> • Appointed to working groups based on the relevance of their skills and the topic • Provide knowledge and skills to support analytical work, research and policy recommendations • Appointed for a minimum period of 3 years
<p>Independent committee or scientific panel</p>	<p>Drawn from across government and non-government bodies e.g. academia, research groups, think tanks, scientific associations.</p>	<ul style="list-style-type: none"> • Ensure the integrity of the strategy • Hold implementers to account • Ensuring it is fit for purpose and responds to the latest science 	<ul style="list-style-type: none"> • Provides quality assurance of the LTS • Objectively assess progress through e.g. annual performance reviews and reports • Provide recommendations to enhance or adjust actions or policies • Provide recommendations for future updates based on e.g. developments in climate science and technology

<p>Citizen Panel</p>	<p>Representatives of Jordan's Civil Society</p>	<ul style="list-style-type: none"> • Two-way interaction between citizens and governments that gives citizens a stake in decision-making with the objective of improving the intermediate and final development outcomes of an intervention. • The citizen panel can play a key role in empowering citizens and giving them the agency to influence the decision-making process. • The citizen panel should be considered a Tier 1, high priority stakeholder group, and partners in the decision-making process with the government. In particular, if there is any decision they strongly disagree with, this should not go ahead. Their decisions can be fed directly to the LTS steering committee, who must be committed to demonstrating how the citizen panel's views have been taken into consideration. • The panel will inform decisions concerning all key elements of the LTS development including vision definition, climate strategy, adaptation, mitigation, consultation on the draft LTS.. The panel will be composed of a representative sample of Jordanian society, in terms (at least) of gender, age, location, social class, race, religion, educational level, and possibly attitudes toward climate change. 	<ul style="list-style-type: none"> • The citizen panel will feed into the National Committee on Climate Change (NCCC) – Interministerial LTS steering committee. The steering committee could embed an agreement between the citizen panel to ensure all feedback from the panel is taken into consideration and fed into future decisions. Additionally, the agreement could also outline that, if any feedback is not considered, the committee will need to provide a justification as why the citizen panel's input will not be fed into the decision-making process. • The technical task force can build capacity through training to ensure all the citizen panel is climate change literate and has the necessary knowledge in regard to Jordan's LTS to make informed decisions. • Training could be provided by relevant experts such as academics, research institutes and the civil society organisation (CSO).
<p>Climate and gender task force</p>	<p>Gender focal points of relevant public entities, IMC, JNCW along with representatives of civil society organizations, donors and private sector</p> <p>The Ministry of Environment could invite the above-mentioned stakeholders to nominate gender focal points to form a gender taskforce.</p>	<ul style="list-style-type: none"> • This taskforce could be coordinated by RSS (or the JNCW) • Following the publication of the LTS the gender taskforce can be embedded in the institutional structure. This could ensure, for examples, there is tracking of gender responsiveness in the implementation of this LTS and provide gender and climate input for international reports such as NDCs and SDGs National Reports among others. • This taskforce could also take forwards other recommendations and actions relating to capacity building and technology and develop an annual work-plan for implementation of these recommendations. 	<ul style="list-style-type: none"> • Responsible for incorporating gender responsiveness in the development of the LTS (including ensuring it is embedded in the vision, climate pillars, actions and criteria for determining actions for example) • Regular meetings to ensure implementation of policies and sharing knowledge about relevant projects and opportunities • Feed into the National Committee on Climate Change (NCCC) – Interministerial LTS steering committee. The steering committee could embed an agreement between the citizen panel to ensure all feedback from the panel is

			taken into consideration and fed into future decisions.
Public-private advisory board	Representatives of ministries and key industries and private sector groups	<ul style="list-style-type: none"> • Act as a hub for actors to share information in a multi-directional manner. • Flagging areas where the LTS may create barriers to business development and investment. • Develop new private-public partnerships, business development, and investment and financing opportunities in both mitigation and adaptation. • Provide up to date information to the private sector on new initiatives, incentive and standards, simultaneously, sector leads can feedback to the board to influence the implementation of the LTS. 	<ul style="list-style-type: none"> • Minimum twice-yearly meetings to provide feedback to the LTS steering committee • Feedback via consultations during LTS development • Develop new private-public partnerships, business development, and investment and financing opportunities in both mitigation and adaptation.

Members of the technical task force and working groups	<p>16 CCDs, found in all 16 Ministries forming the National Climate Change Committee plus independent organisations including</p> <ul style="list-style-type: none"> • Meteorology Department • Royal Scientific Society • Royal Department for Environment Protection • Greater Amman Municipality • Aqaba Special Economic Zone • Jordan Environment Society • National Centre for Agricultural Research and Extension • Department of Vehicle Licensing • Jordan Women National Council
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6.5.2 Summary of recommendations

The following recommendations are relative to Jordan’s existing institutional arrangements. The following recommendations aim to enhance governance structures, whilst ensuring familiarity to stakeholders in order to increase the likelihood of their effective implementation. Note that these are suggestions and should be further refined with stakeholders to reflect preferred structures and engagement needs.

Area	Recommendations	Impact	Relevant organisation to drive this
Approvals	Secure commitment and approval for the LTS development and necessary resourcing and institutional set up from the Cabinet and Senate	High level political commitment raises the profile of the work and helps ensure it is given appropriate emphasis across government	NCCC Ministry of Environment
New functions	Build on the climate change bylaw and NCCC by incorporating the role of LTS steering committee, with clear terms of reference	Building on existing institutional arrangements reduces administrative burden and reinforces the potential role of the existing committee	NCCC
	Provide clarity on the NCCC’s role to review NDC and LTS every five years	The NCCC would be able to oversee coordination of LTS implementation, oversee monitoring of progress of implementation, and ensure action is taken to update the LTS when needed	
	Create a new body – the technical task force – that will lead the coordination of the LTS and appoint permanent staff to this institution	This will ensure there is continuity of staff and available technical expertise in country, retaining knowledge and able to build capacity across other institutions in the longer term	NCCC, Ministry of Environment & CCD
	This should be formed with and managed by the CCD	Forming a separate unit would enhance visibility but it should remain under the mandate of the CCD.	
	This new body can also coordinate a gender and climate task force referred to further in Annex 7 (gender)		
Appoint CCDs or specific climate change focal points within ministries, to be coordinated and supported through CCD and the Technical task force or institution	Dedicated staff in ministries will ensure resource to mainstream climate change, support capacity building across government, and enhance monitoring and reporting	NCCC and Ministries	
Establish an independent scientific body to oversee the quality assurance and monitoring of the LTS	A dedicated independent scientific body can provide impartial advice and hold the government to account on the development and implementation of the LTS	NCCC and Ministry of Environment	

	<p>Launch a citizen panel to establish an open line of communication between Jordan's steering committee and civil society.</p>	<p>A two-way interaction between citizens and governments will provide citizens a stake in decision-making within Jordan.</p>	<p>National Committee on Climate Change (NCCC) - Interministerial LTS steering committee</p>
	<p>Gender focal points of relevant public entities, IMC, JNCW along with representatives of civil society organizations, donors and private sector to form a gender task force.</p> <p>The Ministry of Environment could invite the above-mentioned stakeholders to nominate gender focal points to form a gender taskforce.</p>	<p>Ensures that the LTS development process and subsequent implementation is gender sensitive and maximises opportunities for gender equality, women's voices to be heard, and women's economic empowerment, and minimises potential harms from climate actions</p>	<p>Ministry of Environment to request nominations for focal persons</p>
Roles and responsibilities	<p>Highlight the role of different ministries and institutions in the area of climate change and the need for cooperation to fulfil Jordan's commitments</p>	<p>Clearly defined roles and responsibilities reduces the risk of duplicated efforts and overlap</p>	<p>Ministry of Environment</p>
	<p>Reconsider the current membership of the NCCC making sure that all relevant stakeholders are represented. This includes representatives of local communities, gender and vulnerable groups, and the private sector</p>	<p>Ensuring the NCCC is diverse and all voices are fed into the LTS</p>	<p>NCCC</p>
	<p>The NCCC could consider creating a sub-committee co-chaired by the ministry of finance and the ministry of energy (and/or transport) so that these ministries become accountable to deliver the LTS besides the ministry of environment.</p>	<p>Avoids the agenda being solely owned by the Ministry of Environment and promotes ownership</p>	<p>NCCC</p>
	<p>Ensure that there is representation from all entities (including those not 'typically' relevant) on both adaptation and mitigation issues</p>	<p>The LTS climate strategy should be an integrated response, and the vulnerability assessment in Annex 3 shows that adaptation will also be key for the Ministry of Industry, Trade and Supply and for the Ministry of Transport for instance. In addition, there needs to be a concern for potential maladaptation due to mitigation actions (and vice versa), which would benefit from broader participation.</p>	<p>NCCC</p>
	<p>Entities identified in Annex 2 of the bylaw (see appendix) need be reviewed to ensure that it incorporates all relevant technical organisations</p>	<p>Technical agencies and should be considered for roles in the technical task force or institution, and scientific steering committee</p>	<p>NCCC and CCD</p>

	Entities identified in Annex 3 of the bylaw (see appendix) need to establish a robust methodology on data handling. Data sharing should be encouraged, and annual reports submitted	This will ensure that all data processes are consistent and transparent	Annex 3 entities
Capacity and staffing	Invest in the focal points acting in the technical task force or institution (capacity building, time, and formation of dedicated roles), and technical working groups, and appoint them to their positions for a sufficient period of time (at least 3 years)	This will strengthen their work and it's highly recommended to prepare their successors in advance	NCCC and Ministry of Environment
	Increase the number of the staff within the CCD and enhance their capacity to be able to carry out responsibilities in the long term. Ensure they are appointed for a minimum of three years. A comprehensive capacity building and technical assistance programme is needed to build knowledge and technical skills.	This will strengthen human resources within the CCD permitting the directorate to fulfil responsibilities as a focal point to the UNFCCC Enabling the role of MoE with the staff of CCD will be the cornerstone for establishing a compatible climate change system that would generate its own monitoring systems & reports, with capacity building transparency needs.	Ministry of Environment & CCD International partners
	Provide local governments with the necessary training resources to lead effective behaviour change campaigns, this could include capacity building workshops	In order for local governments to implement elements of the LTS, it is vital these entities have the required resources to take full ownership of mitigation (and adaptation) actions at the local level	Local Government & CCD
	Build capacity through education and training on the key LTS topics for the citizen panel and climate change and gender task force to ensure all are climate change literate and have the necessary knowledge in regard to Jordan's LTS to make informed decisions. They will also need to be facilitated through deliberative discussions, to voice opinions and reach decisions where necessary.	This will enable citizens of the panel to voice informed opinions regarding the development of the LTS and reach decisions where necessary regarding its design. Capacity building will also ensure that the climate change and gender task force can provide informed review and recommendations.	Technical Task Force
Coordination	Ministry of Environment to coordinate continuously with the CCD as the chair/coordinator of the new LTS technical task force, supporting them in identifying their capacity building needs	Increased transparency between the CCD and Ministry of Environment. Both entities would be in align and be working towards the shared vision	Ministry of Environment & CCD

Recommendations and Best Practices to Develop a 2050 Pathway / Long-Term Low-carbon and Climate Resilient Strategy (LTS) for Jordan

<p>Establish an LTS monitoring and reporting system, with the technical task force or institution reporting to the CCD, who is mandated to provide progress reports to the NCCC as the LTS steering committee. Ministry CCDs should report progress on mainstreaming and implementation</p>	<p>Establishing a monitoring and progress reporting system and structure will improve accountability and mainstreaming and also highlight capacity needs and issues</p>	<p>CCD and Ministry CCDs</p>
<p>Enhance private sector engagement by building on previous Article 6 and project implementation engagements.</p>	<p>It would give an additional value to include the private sector but requires the identification of private sector entities and a willingness from their side to participate.</p>	<p>CCD and ministries</p>

6.6 Challenges and bottlenecks



Limitations of Jordan’s existing climate governance include the following:

Key challenges/bottlenecks in Jordan	Potential solutions
<p>The bylaw is not functioning: Although the climate change bylaw was issued in 2019, it is not fully functioning yet. To date, the number of meetings between the NCCC and the technical teams has not been sufficient and no major decisions have been taken on the ground. Also, there are entities identified in Annex (3) of the bylaw who are responsible for providing needed data for the greenhouse gas (GHG) inventory estimation, however, only a slight improvement was detected in providing and facilitating collection of data and still more collaboration is needed. Secondly, institutions included under the Annexes of the bylaw – such as the Jordan Meteorological Department – are not currently included in the committee</p>	<ul style="list-style-type: none"> • That MoEnv as chair of the NCCC should highlight continually the role of different ministries and institutions in the area of climate change and the need for cooperation to fulfil Jordan’s commitments. • Support from international capacity building programs could enable and strengthen the committee and technical groups formed according to the climate change bylaw. • Investing in building the capacities of the focal points acting in the technical groups and appoint them to their positions for a sufficient period of time (at least 3 years) to be able to strengthen their work and it’s highly recommended to prepare their successors in advance. • CCDs at different ministries and institutions are important vehicles to mainstream climate change into the strategies and policies of their respective institutions. As such, it is recommended that the MoEnv coordinates continuously with these departments and supports them in identifying their capacity building needs. • Bringing in technical organisations to the NCCC would provide a mandate to build their capacity and play a role in climate projections, vulnerabilities and in operating early warning systems
<p>Lack of capacity and awareness on climate change: The climate change agenda is not yet a priority in Jordan. The majority of Jordanian policymakers still don’t see climate change as a threat and most are not well aware of its consequences and humanitarian, economic and social costs, nor are they well aware of the benefits of formulating and implementing more ambitious climate action⁹³.</p>	<p>Building capacity amongst the highest-level decision makers will be critical to support the development and successful functioning of the LTS. Where there is capacity and knowledge of climate change amongst ministers and senior officials, climate change has been more successfully integrated into sectoral policies.</p> <p>The LTS development process should therefore ensure it builds in capacity development and clearly makes the link between climate and development.</p> <p>Ensuring capacity is retained ‘in house’ will be key to a more sustainable climate change response. Ensuring technical entity within the CCD, building in-house technical expertise that can maintain a stable, continuous approach and response and reduce reliance on third parties,</p>

⁹³ Combaz, E. (2019). Jordan’s environmental policies and engagement on climate change. K4D Helpdesk Report. Brighton, UK: Institute of Development Studies. https://assets.publishing.service.gov.uk/media/5d30a131ed915d2ff003b781/619_Jordan_Environment_Policies_and_Engagement.pdf

<p>Legal and institutional limitations: At the NCCC, the Ministry of Environment does not have a veto right for all policies under discussion. This leaves the NCCC institutionally weaker than it could be and shows the limits to the policy commitment toward ambitious implementation of climate policies. In addition, attention to sectoral interdependence is not mainstreamed at the NCCC, for example when designing policies for sectors such as water, energy, and food⁹⁴. The Ministry of Environment operates under the mandate of the Environment Protection Law passed in 2006 which does not specifically refer to climate change. Similarly, the Jordan Vision 2025 does not explicitly make a connection between climate change and the initiatives it lays out to strengthen line ministries' engagement with resource security and management in water, energy, food and agriculture⁹⁵.</p>	<p>consultants and international organisations is a desirable long-term goal.</p> <p>The LTS could potentially provide the vehicle through which legal and institutional structures are strengthened. For example, by laying out a vision and explicitly connecting climate and other development initiatives and the pillars through which sectors should integrate these.</p>
<p>Human resources: The CCD at the Ministry of Environment, as the UNFCCC focal point, plays a pivotal role in climate change activities at the national level. However, the directorate needs strengthening in term of human resources and sustainability.</p>	<p>Building an in-house group of technical specialists that can be trained and retained in the Directorate to support sustainable climate policy and analytical work is one solution. As a dedicated unit, they might also help overcome issues of high staff turnover and limit the amount of 'outsourcing' of work, retaining institutional memory and technical skills. This unit could be located outside of the Ministry of Environment and act as a standalone autonomous expert institution but should retain strong links and reporting through the CCD.</p> <p>Enabling the role of MoE with the staff of CCD will be the cornerstone of establishing a compatible CC system that would generate its own monitoring systems & reports, with capacity building on transparency needs.</p> <p>Strengthening & expansion of CCD at MOE is highly needed and this would need several elements:</p> <ul style="list-style-type: none"> - Raising the number of well-educated and trained employees - Legalising a work base and additional payment that would provide benefits (incentivise employees + maintaining sustainability of development + reducing the gap between civil servant & private sector salaries)

⁹⁴ACT Alliance (2018), Enhanced Climate Action in Response to 1.5°C of Global Warming. Scaling Up Nationally Determined Contributions, https://www.preventionweb.net/files/62199_actalliancereport1.5c.pdf

⁹⁵Combaz, E. (2019). Jordan's environmental policies and engagement on climate change. K4D Helpdesk Report. Brighton, UK: Institute of Development Studies. https://assets.publishing.service.gov.uk/media/5d30a131ed915d2ff003b781/619_Jordan_Environment_Policies_and_Engagement.pdf

<p>Unclear roles and responsibilities and coordination mechanisms: Despite the climate change bylaw there are not sufficient institutional arrangements in Jordan that define clear roles and responsibilities of different ministries with regard to climate change. Focal points and entities are not engaged and committed to its implementation, decisions have not been taken and few meetings have been held. It has the potential to be an effective mechanism to drive and coordinate Jordan's climate response if properly implemented.</p> <p>In previous experiences of both of CCNPolicy and the NDCs, it hasn't been a mandated responsibility of each sectoral ministry.</p>	<ul style="list-style-type: none"> - Legalising the capability of MOE to contract and hire specialists according to their needs <p>The nomination of CCDs/active focal points at different ministries and institutions as vehicles to mainstream climate change into the strategies and policies of their respective institutions could be one solution, also minimising burden for individuals conducting climate change work on top of their day to day responsibilities. Such individuals would also give the CCD a mechanism for engaging and monitoring sector-level climate actions.</p> <p>Within the up-coming updated policy and updated NDCs the role of implementation and responsibility of each institution has to be identified, and via validating the NDC and climate change policy by the cabinet, it will become a mandatory plan in each ministry.</p> <p>Sector plans, mandated by the prime minister, could ensure entities address the LTS in the sector EDPs.</p>
<p>High turnover of staff and focal points: Jordan has faced a challenge of high turnover of staff, both technical and managerial, with government changes. This has limited the ability to retain institutional knowledge, build technical capacity and strengthen climate mainstreaming. It has also led to policies and strategies being superseded, which would need to be overcome for the LTS development.</p>	<p>Ensuring that focal points and staff appointed to roles are given a minimum of a 3 year term would help support the institutionalisation of knowledge.</p> <p>There is also need is to enable the system inside each entity to well engage their development planning with climate change requirements and the LTS (e.g. NDC tracking , identifying the sector vulnerabilities and needs, reporting & archiving) in a way that would at the same time raise the efficiency of that institution towards climate change and would decrease the reliance on personal knowledge.</p>
<p>Disconnect between climate planning, and national planning and budgeting: The Ministry of Environment is mandated to coordinate climate change-related activities, but it is the activities of other sectoral ministries that are affected by, or have the potential affect, climate change. Furthermore, MOPIC and the Ministry of Finance are in the driver's seat in defining national development priorities and formulating the national budget. There is therefore a disconnect between who is identifying, implementing and financing climate actions which leads to coordination challenges and lack of implementation. The national budget also does not include a specific allocation for climate change activities. In addition, MOPIC and the Ministry of Finance are the entities who engage with development partners and help maintain records of Official Development Assistance (ODA) flowing to various sectors.</p>	<p>The LTS process is unlikely to solve these challenges but might help to identify potential options to improve coordination. As the strategic vehicle for mainstreaming long-term climate change considerations into, engaging the Ministry of Finance could help to identify new mechanisms for allocation of budgets to ensure there is a linkage to climate pillars, for example.</p> <p>MoE has had success in engaging on NDC priorities within sectoral EDPs (economic development plans) which are managed and directed by both MOPIC & Ministry of Finance. This mechanism could be built upon for the LTS.</p> <p>MOE is the national focal point for two important climate funds (GCF & Adaptation Fund) and will issue a country programme for the GCF soon. An ongoing national & international discussion is ongoing that will lead to budgeting a climate change line by the ministry of finance in the</p>

<p>There also is no effective coordination and information sharing regarding climate finance or integrating climate change into development planning at national, sectoral, and subnational levels.</p>	<p>budget of MOE and might be extended to other ministries. MOE are presently reviewing the achievements of the previous NDCs and updating the NDC with GIZ, and there is the potential to conduct outreach with all entities to close the gap on knowledge of already financed climate change projects.</p>
<p>Poor integration and knowledge in local governments: There is little integration at present between local and national government action on climate change. Despite many local governments undertaking their own climate plans and implementing actions, these are not integrated with national strategies and there is no integrated MRV of climate action.</p>	<p>Given that some of the longest time horizon climate plans are at subnational level, and many actions will be implemented locally (plus the need to engage citizens), it will be important to ensure collaboration and integration with local governments in a governance structure for the LTS. GAM are part of the NCCC but the Ministry of Local Administration should also ensure it engages with sub-national governments and local climate plans are communicated.</p> <p>In addition to this gap, the last two or three cabinet turns were discussing the merge of the entire MOE within a multi candidate ministries . As Jordan is in a transitional period of new structured bodies, the government of Jordan are trying de-centralization of governorates, and within that there is a requirement to have a climate change action plan at each to be systemized and mandated by the ministry of local administration.</p>
<p>Lack of civil society engagement and input on climate change: Currently the structures of the NCCC and nominated groups under the Annexes do not include opportunities for civil society engagement and input on climate change, nor wider industry groups or private sector stakeholders (only as, for example, data providers. The NCCC is formulated only from SGs of 16 governmental entities headed by the minister of environment.</p> <p>The main and critical point in Jordan's previous environmental work that it hasn't had a clear identification of more than 112 NGOs, or a clear identification and expertise of the NGO entities themselves. However, 2 or 3 and those are officially mandated within the ministry in other themes.</p> <p>Climate change in Jordan was constrained previously to renewable energy and energy efficiency without empowering action on adaptation.</p>	<p>The LTS process should embed a citizen engagement programme to improve civil society engagement, awareness and input in decision making. In addition, a public-private advisory board as part of the LTS governance could enhance input.</p> <p>On adaptation a number of social societies are and will be fully engaged in working groups.</p> <p>Private sector engagement has occurred on Article 6 issues via MOE, and fully engaged in implementing all climate change projects that have been implemented via other ministries like MEMR or MWI or projects via MOE. It would give an additional value to include the private sector but requires the identification of private sector entities and a willingness from their side to participate.</p>

7 Stakeholder engagement to inform and shape the LTS

See Annex 9 for a suggested list of institutions and stakeholders to engage

This section summarises the key stakeholders and engagement processes for the LTS development. Note that the following section summarises specific processes and opportunities to engage citizens.

Navigation

Regarding the “stakeholder engagement” element of the Roadmap, this section provides:



- **Role of stakeholder engagement**
 - o A description of the role that this element plays in the LTS development.
- **International examples**
 - o Examples of how this was undertaken in the development of other LTSs.
- **Information to develop Jordan’s stakeholder engagement: previous stakeholder engagement experience on climate change**
 - o Core information relevant to develop the stakeholder engagement plan for Jordan.
- **Framework for stakeholder engagement**
 - o A framework or approach to how this element may be presented in Jordan’s LTS and what it might include.
- **Recommended approach**
 - o A summary of recommendations for developing and implementing this element in Jordan’s LTS.

7.1 Role of stakeholder engagement



Stakeholder engagement is an inclusive process conducted throughout a project life cycle and is necessary for successful mitigation and adaptation planning. It is a key aspect of both governance, and communication.

Stakeholder engagement should be carried out from inception and until the end, for the LTS development to be a successful process. The LTS development process should include consultation with a range of different stakeholders. Engaging stakeholders from across and outside the government in every part of the LTS design and implementation is essential to create a comprehensive and inclusive LTS, and to support buy-in.

Stakeholders whom the LTS development process should engage with include: public sector, private sector and non-state actors. Figure 7-1 below summarises the intended stakeholders for the LTS development.

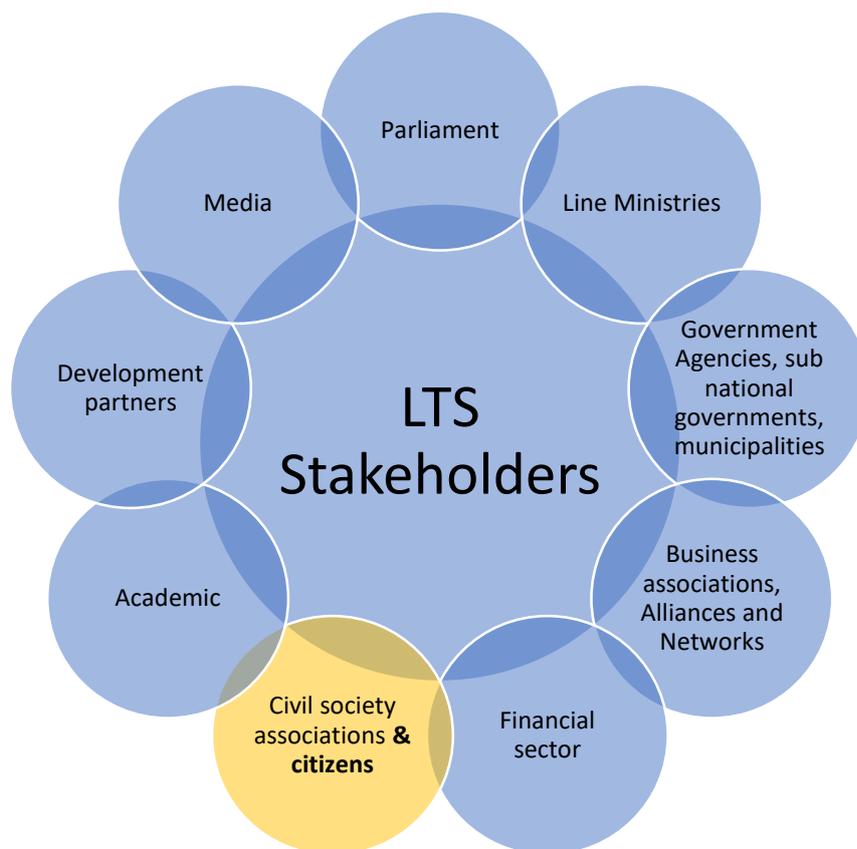


Figure 7-1: Typical LTS stakeholders (note that citizens are specifically addressed in the following section)

Source: Developed by Ricardo Energy and Environment

Stakeholder engagement enables:

- Cross-sectoral dialogue to promote synergies and address cross-cutting priorities;
- Data collection, analysis, and deliberation across diverse stakeholders and sectors;
- Establishment of shared LTS assumptions;
- Broader awareness of and public support for change; and
- A coordination structure at national and subnational levels.

Stakeholder engagement could be undertaken through different measures, including workshops, public consultation roundtables, multi-stakeholder sessions, information-sharing protocols, and surveys.⁹⁶ The creation of citizen advisory and steering groups is one example of a successful stakeholder participation strategy – detailed further in section 8). This stakeholder group could be created to ensure a comprehensive understanding of the country's environment, problems, public expectations, and guarantee public participation process.

A bespoke stakeholder engagement process should be developed to reflect the social and cultural context of Jordan. The OECD Climate Expert Group states 'it is important for the stakeholder engagement process to be designed as an iterative process that allows for a dynamic exchange of views and to facilitate a shared vision'.⁹⁷

⁹⁶ The Coalition of Finance Ministers for Climate Action (2020), "Long-term strategies for climate change: A review of country cases": <https://www.financeministersforclimate.org/sites/cape/files/inline-files/Helsinki%20Principle%201%20-%20Review%20of%20Long-Term%20Transition%20Strategies%2010July2020.pdf>

⁹⁷ OECD (2020), Long-term low emissions development strategies. Cross-country experience, https://www.oecd-ilibrary.org/environment/long-term-low-emissions-development-strategies_1c1d8005-en

7.2 International examples



Different approaches have been adopted by different countries - Table 7-1 includes some examples. Fiji⁹⁸ has held three National stakeholder consultation workshops in the development of their LTS. A wide range of stakeholders provided feedback on proposed plans. Germany developed a bottom-up approach, randomly selecting 500 citizens to discuss the proposed Climate Action Plan⁹⁹. To ensure ideas and views are shared freely in an open environment, it may be useful to set up bilateral stakeholder sessions alongside multi-stakeholder sessions. This ensures stakeholders are comfortable in sharing sensitive issues. An example of this is South Africa, where stakeholder consultations were held under Chatham House Rules¹⁰⁰.

It is key to conduct consistent stakeholder engagement throughout all stages of the LTS. This will increase public acceptance of the strategy as problematic decisions like transitions that may affect a sector or proportion of businesses adversely. This ensures that difficult decisions are made openly and transparently. Engagement is the foundation of good governance and can mandate better decision-making outcomes for those affected¹⁰¹.

Table 7-1: Examples of country specific stakeholder processes

Country	Stakeholder Process
France Low-Carbon National Strategy	An ad hoc Council for the Energy Transition (CNTE), was institutionalised by law. This council included representatives from business, NGOs (environmental, social, and consumer organizations), trade unions, subnational authorities, and members of the National Assembly and Senate. A plenary of more than 130 representatives was created, which met monthly. In addition, the CNTE had a consultative body of 50 people with six constituencies: businesses, trade unions, environmental NGOs, caritative and consumer NGOs, local authorities (elected representatives), and members of parliament. Independent experts supported the plenary and working groups.
South Africa Long Term Mitigation Scenarios	In South Africa, business, industry bodies, civil society, labour, academia, local governments, and government agencies were involved in the scenario-building team. In addition, there were several high-level round tables for government (including the directors general of various government departments), civil society (including a dozen major NGOs, research, faith-based, and civic organizations), labour, and business. These round tables were aimed at communicating the LTMS results across the country's leadership.
Botswana Vision 2036	A country-wide consultation process was undertaken, with Kgotla meetings, these were forums for the community, and focus group discussions were held to get consensus. Over the course of developing the strategy, 103 localities were visited.

⁹⁸ Ibid.

⁹⁹ Ibid.

¹⁰⁰ Government of South Africa (2020), "Low Emission Development Strategy":

<https://unfccc.int/sites/default/files/resource/South%20Africa%27s%20Low%20Emission%20Development%20Strategy.pdf>

¹⁰¹ WRI (2019), Good governance for long-term low-emissions development strategies, <https://www.wri.org/publication/good-governance-long-term-low-emissions-development-strategies>

7.3 Experience of stakeholder engagement experience on climate change to build upon



Jordan considers climate change stakeholders as all persons or organizations that have investments in the content of the National Climate Change Policy (e.g. the NCCC) and have vested interests in its sustainability as the overall umbrella of climate change related activities in the country. They also possess different degrees of influence on the process of implementing the policy and the achievement of stated goals.

Key stakeholder groups include local governments, municipalities, local communities, local associations and societies, NGOs, academic and research institutions, private sector, and other civil society organizations. Stakeholder buy-in and continuous involvement are required to guarantee the sustainability of actions towards mitigation and adaptation to climate change and successful implementation of mitigation and adaptation actions.

Stakeholder engagement in Jordan is connected to the development of policies and strategies as stated in article 3, paragraph b in the Climate Change by-law No. 79 of 2019. The Ministry, in coordination with the relevant stakeholders are responsible of submitting proposed policies and strategies to adapt to climate changes, reduce their negative effects, and reduce greenhouse gas emissions to the National Committee on Climate Change for approval.

As owner of the Climate Change Policy, the NCCC keep continuous communication with policy makers/decision takers. Keeping policy makers and decision takers informed on the progress of the project implementation and achievements on climate change is critical to insure continuous political support to the mitigation and adaptation measures, and maintain focus on the project progress. The impact of climate change is to be considered by planners at all levels (national, regional and local).

It is recommended that the LTS stakeholder engagement should build upon and take inspiration from previous similar stakeholder engagements – examples are provided below.

Stakeholder engagement for climate financing analysis of 35-projects from the Nationally Determined Contributions (NDC)

(carried out by Ricardo and Hima)

This project carried out virtual workshops, one-one meetings, e-mails, official letters, and phone calls to collect information and review the actions in five-sectors; water sector, energy sector, transportation sector, agriculture sector and health sector. This project involved engagement with stakeholders on the mitigation opportunities in five-sectors.

In the first round of the project, five workshops with stakeholders were conducted from 3rd – 4th November 2020, in order to provide feedback to stakeholders following expert's review of the information they have provided of the 35-actions from the Jordanian NDCs.

Another five workshops were also conducted after preparing the draft cost benefit analysis report, in order to review the report with each sector.

As part of the stakeholder engagement activities, it would be important to make stakeholder aware of the future planned LTS development activities, and already gather data on long-term mitigation actions.

Preparation of the Biennial Update Reports (2017 and 2020) *(Carried out by RSS)*

The preparation of the Biennial Update Reports (2017 and 2020) required the support of key national Stakeholders and line ministries. This was mainly achieved through the involvement of climate change national committee focal points and the Ministry of Environment (carried out by RSS) through:

- Holding an Inception Workshop where all Stakeholders were invited. The objective of this workshop was to explain the main objectives of the project as well as highlighting the main sections of the BUR and communicating the importance of the participatory approach in preparing such national reports.
- Hold bilateral meetings for each sector/ or sub-sector to facilitate the data gathering process and to explore new primary data sources.
- Several Stakeholders are chosen to be members within the GHG inventory team; they were trained to carry out sector estimations using the 2006 IPCC guidelines and software.
- Relevant Stakeholders were involved in LEAP training (in total 35 persons were trained).
- Stakeholders were engaged at the final stage; the draft BURs were circulated via e-mail for validation and feedback by the national climate change committee –focal points (At the first BUR- conditions were better (no COVID) and 3-validation workshops were held for stakeholders).

PMR projects

Stakeholders' engagement activities in **MRV implementation (2018)** were through:

- Holding an Inception Workshop where all Stakeholders were invited. The objective of this workshop was to explain the main objectives of the project as well as secure involvement and buy in for the system highlighting the value and benefits of such system.
- Validation of MRV Design; this phase was only with energy sector Stakeholders- this was done through one to one meetings.
- Identifying available projects types at the national level and mapping the data sources and the structure of the projects managements within each entity- this was done through one to one meetings.
- Training of the identified Stakeholders on the MRV system- this was done through group training.

The **Promotion of Jordan involvement in Article 6 (A6) -2020** project was conducted through the technical team for A6, chosen from focal points. 8 online sessions were held to train them on A6 concepts.

The Stakeholder engagement activities through the ongoing project **establishment of an effective Governance system for NDC revision & implementation** included:

- Holding an inception workshop where all Stakeholders were invited. The objective of this workshop was to explain the main objectives of the project.
- Hold training to all Stakeholders involved in the NDC process with the objective of explaining the Enhanced Transparency Framework (ETF) under the Paris Agreement.
- Prepare recommendations for the MoEnv on NDC update- ongoing (should be done through bilateral meetings with line ministries).

These engagement mainly involved ministries and focal points in the projects' inception and validation modules with a special focus on building and strengthening the Stakeholders' climate change knowledge.

7.4 Framework for stakeholder engagement



7.4.1 Identification of stakeholders

Stakeholders are project-affected parties who are directly or indirectly affected, by a project or may be, as well as other interested parties who may have interests in a project and/or the ability to influence its outcome. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organisations and groups with special interests, the academic community, or other businesses. This Section presents the stakeholder groups and provides a preliminary identification and mapping of the stakeholders for the Project.

In particular, for the LTS, the stakeholders may be identified as following:

1. Local stakeholders representing the groups of citizens, local businesses, and associations (note that this overlaps with citizen engagement)
2. Public stakeholders who may have a possibility to influence and make decisions on implementation of the project and/or may have an interest in the Project. This group mainly includes governmental entities such as the Ministry of Environment (MoEnv), Ministry Labour (MoL), Ministry of Health (MoH), Ministry of Water and Irrigation (MWI)/Water Authority of Jordan (WAJ, etc.).
3. Private stakeholders who may have an interest in the Project.
4. Non-state stakeholders who may have a possibility to influence or/ and have an interest in the Project.

The main groups of stakeholders identified are listed in the table below.

Table 7-2 High level initial stakeholder identification

Stakeholders	Relevance to the LTS?
Public sector	
Parliament	Important for political buy in of LTS goals and country ownership. Approvals for MRV systems and responsibilities.
National Climate change Committee NCCC (Line Ministries)	Important for country ownership. Provide enabling environment for priority actions. Act as executing body for projects and programmes. Provide support and advice to project. Provide co-financing to projects and programmes.
Government Agencies, sub national governments, and municipalities	Provide enabling environment for priority actions. Act as executing body for projects and programmes.
Private sector	
Business associations, alliances and networks	Act as an executing body for projects and programmes Provide support and advice to project
Financial sector	Potential funders for projects and programmes
Non-state actors	

Media	Provide public coverage and awareness raising on LTS process and climate change.
Civil Society Associations and citizens ¹⁰²	Act as executing body for projects and programmes Provide support and advice to project.
Academia	Research in modelling, baseline and scenario setting. Research on climate impacts and vulnerabilities.
Development Partners	Undertaking processes that are related to the LTS development process e.g. NDC revision, setting up of MRV frameworks, scenario setting and modelling, baseline setting. Act as executing body for projects and programmes. Provide support and advice to project proponents.

The stakeholders can be divided into three-tiers. These tiers describe the current level of support or involvement a stakeholder has in the LTS. There are three tiers used in this process (Table 7-3). This ranking indicates the strength of the relationship the LTS has with the stakeholder, and how closely or frequently they are contributed in the LTS.

Table 7-3: Stakeholder tiers

Tier	Description
1	Highest priority stakeholder, essential technical, strategic or review inputs or required for approvals
2	Medium priority stakeholders, important contributions to knowledge and understanding or to include in more general communications and consultations
3	Lower priority stakeholders, to include in more general consultations and occasional inputs and information

Multiple stakeholder engagements will be required over the course of LTS development. Stakeholder engagement should be carried out from the inception of the development process until the end of it, in order to have a successful strategy. The plan has to describe how the citizens and stakeholders have been involved in its elaboration, and how they will be involved in implementation and validation.

Below are some initial suggestions on this stakeholder engagement plan.

7.4.2 Stakeholder Engagement opportunities

This section shows how the different stakeholders will be engaged, when they should be engaged and how. The engagement were classified into four activities:

- Initial awareness raising
- Seeking inputs to the LTS development, the key components of which are:
 - Vision
 - Mitigation (including target setting, future scenarios and pathways, long term mitigation actions & modelling the pathways)
 - Adaptation (including collecting or updating data, identifying and validating the climate risks and vulnerabilities, identifying adaptation options)
 - SDGs and cross-cutting issues (development goals, economic recovery, inclusivity etc)
- Institutional Arrangements (links also to governance structures and processes).

¹⁰² Note that citizen engagement is specifically detailed in the next section

- Validation of the draft LTS
- Awareness raising on the final LTS

The stakeholder engagement plan is shown in the attached spreadsheet.

7.4.3 Engagement methods

The following engagement methods can be used. The objective of employing various methods with each stakeholder group is in order to ensure easy, transparent, direct, open and interactive communication with all stakeholders and to get as earlier as possible their feedback in the different tasks they will be engaged in. The mode by which the stakeholder(s) will be engaged/ consulted, which might include but is not limited to the following table.

Modes are identified against technical inputs (e.g. data collection and analysis, technical review, compilation and writing), strategic inputs (e.g. shaping the direction, priorities, goals/themes), and engagement (e.g. awareness raising, information sharing, knowledge sharing)

Table 7-4 Communication Modes

Mode	Comment	Technical inputs	Strategic inputs	Engagement
Invitation Letters	Useful in early stages of consultation to provide information regarding the project and how to get involved. May be hard copy or electronic.	n/a	✓ Confirm strategic goals/objectives etc and communicate formal procedures	✓✓ Obtain buy-in to the process Suitable for nomination of focal points to the project, and official requests to collaborate.
Bilateral meeting	One-to-one meetings. May be face to face or virtual. LTS process should be inclusive so bilateral meetings are likely limited in scope	✓✓ Likely most appropriate for technical inputs and meetings between experts.	✓ Obtaining key inputs or sign off on LTS elements e.g. vision statement	✓ Following up on initial engagement
Activities related to coordination with related activities / organisations	It will be important for the LTS team to align and engage with other activities being undertaken in country and there are likely useful benefits for stakeholder engagement through coordinating events and communications. For example <ul style="list-style-type: none"> Utilising wider stakeholder invitations e.g. where events are organised for key individuals, collaborating to include key LTS actions where 	✓ To align any technical processes ongoing e.g. other programmes on mitigation, adaptation etc	✓ To align priorities, goals, commitments etc e.g. with NDC processes	✓✓ Primary purpose would be to maximise engagement and information sharing

Mode	Comment	Technical inputs	Strategic inputs	Engagement
	<p>appropriate to maximise outputs for stakeholder attendance</p> <ul style="list-style-type: none"> • Attending events (in person or virtual) being conducted by parallel projects to ensure information sharing • Ensuring communication processes are in place to share outputs from activities etc, e.g. coordinating climate policy/NDC/NC/BUR/LTS activities. <p>These can be useful to maximise contact time with stakeholders and ensure that processes are 'joined up'.</p>			
Email	<p>Likely most common form of communication for the LTS technical task force and information sharing between core project team.</p> <p>Direct email is most appropriate for data requests or to share outputs for review.</p> <p>Data and information shared via email should be saved securely following good documentation practices.</p>	<p>✓✓</p> <p>For data and information requests</p>	<p>✓</p> <p>For project updates</p> <p>For sharing outputs for review and sign off</p>	<p>Not recommended</p>
Questionnaires and Surveys	<p>Structured way of obtaining the stakeholders' feedback, able to reach a large number of stakeholders, considered convenient and a good starting point. Might be useful for gathering knowledge and inputs from citizens, stakeholders and citizen panel.</p> <p>Electronic surveys are more time efficient and data entry more accurate than paper/in person, however in person surveys may be more appropriate in certain circumstances e.g. where stakeholders do not access to IT equipment, remote areas, on-the-spot surveys during in person situations</p> <p>Resource needs will vary based on needs and scale but likely to need as a minimum a survey software account and staff time to develop, circulate and analyse.</p>	<p>✓</p> <p>Less suitable for data and technical inputs except where used for citizen inputs on e.g. measures and responses, climate impacts etc</p>	<p>✓✓</p> <p>More suitable for strategic questions e.g. consulting on goals/objectives of the LTS</p>	<p>✓✓</p> <p>Useful for reaching wide numbers of people for feedback (and in doing so, engage)</p>

Mode	Comment	Technical inputs	Strategic inputs	Engagement
	Good practice to ensure that outcomes are later summarised and circulated to participants with an explanation of how they will be used.			
Structured Interviews	<p>Useful for obtaining specific information from wider stakeholders in the early stages of the project</p> <p>More formal / structured small group or one-to-one engagement with pre-prepared discussion topics or questions</p> <p>Likely to mostly be used for gathering key inputs or seeking feedback from ministries, agencies and other stakeholders as part of official consultation events</p> <p>Resource needs likely limited to the analysis of responses.</p>	<p>✓✓</p> <p>Very useful for technical inputs around specific sector challenges and opportunities or on gender, SDGs etc</p>	<p>✓✓</p> <p>Useful for obtaining feedback on e.g. vision statement, ministry/sector priorities for actions etc</p>	<p>✓</p> <p>Could be used as part of formal consultation exercises</p>
Small group meeting / Round Table Discussions	<p>Groups of 3-8 for discussion on key topics, issues, reviews, technical inputs etc. May be in person or virtual using software such as Zoom, MS Teams etc.</p> <p>Facilitated debates between groups with different views and useful for engaging stakeholders in specific sectors on topics, e.g. could be useful for discussing action criteria or key actions under pillars relevant to different sectors, where a range of voices is needed but not an extensive group.</p> <p>May also be useful for provision of targeted training and capacity building, and for inputs from the citizen panel and gender task force to the technical task force / technical working groups</p> <p>Resource needs are likely to be minimal, requiring only meeting space or online meeting software account.</p>	<p>✓✓</p> <p>Very useful for obtaining or checking technical inputs or issues with technical groups</p>	<p>✓✓</p> <p>Very useful for strategic inputs around specific sector challenges and opportunities, the vision statement and climate pillars, and finalising/signing off LTS elements</p>	<p>✓✓</p> <p>Very useful for engaging stakeholders on key topics and seeking feedback e.g. on action criteria or vision statement and goals</p>
Stakeholder workshop / meeting	<p>Larger (8+) and/or longer (>2 hours) sessions, may be in person or virtual</p>	<p>✓✓</p> <p>Can be useful for technical inputs where these are being shared</p>	<p>✓✓</p> <p>Very useful for strategic consultation and validation of e.g.</p>	<p>✓✓</p> <p>Very useful for engaging stakeholders and formally</p>

Mode	Comment	Technical inputs	Strategic inputs	Engagement
	<p>Likely to be used at certain key points in the LTS development – see section 1.1 for examples – as part of formal communications on progress.</p> <p>May wish to incorporate capacity building and technical inputs as well as consultation elements in order to build engagement and understanding, and empower participants to input, as well as just communicate on progress.</p> <p>May be undertaken with a range of stakeholders; likely that stakeholder workshops would be split into those central to the LTS development from a political perspective e.g. internal ministry and agency workshops, and those more externally facing e.g. with development partners, private sectors, citizens etc.</p> <p>Good practice to ensure that outcomes are shared via ‘workshop reports’ as a record of activities and discussion</p> <p>Resource needs are likely to include venues and catering, PA equipment, printing, facilitation and translation.</p>	<p>and validated with wider stakeholder groups, or for capacity building activities</p>	<p>challenges and opportunities, the vision statement and climate pillars, and finalising/signing off LTS elements</p>	<p>communicating outputs of the work</p>
Exhibitions and Road Shows	<p>Useful way of presenting information and options to the public, especially local communities and able to reach large numbers of stakeholders/ people if well-advertised.</p> <p>Likely to require high levels of planning, facilitation, potentially translators and other support staff to manage, supported by media campaigns and publicity.</p>	<p>✓</p> <p>Likely to be a useful tool for community level data gathering e.g. on climate impacts and vulnerabilities in different areas for different groups.</p>	<p>✓</p> <p>Potentially useful as part of wider citizen engagement for the LTS process and on outcomes</p>	<p>✓✓</p> <p>Very useful for engaging stakeholders and formally communicating outputs of the LTS in different areas for different groups.</p>
Survey / remote information gathering	<p>Use of online tools and survey software to gather opinions (may be voting, information gathering, feedback etc)</p> <p>This might also include the development of specific tools, apps, web platforms, ‘carbon calculators’, games and other</p>	<p>✓✓</p> <p>Very useful for technical inputs around specific sector challenges and</p>	<p>✓✓</p> <p>Useful for obtaining feedback on e.g. vision statement, ministry/sector</p>	<p>✓✓</p> <p>Could be used as part of formal consultation exercises and where specific tools developed for</p>

Mode	Comment	Technical inputs	Strategic inputs	Engagement
	interactive elements that can both engage and gather inputs.	opportunities or on gender, SDGs etc	priorities for actions etc	engagement purposes also feed in technical information
Telephone/con-call	Engagement via telephone/conference call, e.g. for specific insights Likely to be used mostly for specific questions by technical teams, or to follow up on queries or participation. Good practice to ensure any data, knowledge or insights are fully documented and recorded centrally for future reference.	✓✓ Likely to be most useful for dealing with specific questions and challenges at a technical level	Less likely to be relevant for strategic decision-making	✓ For strategic engagement e.g. with high level officials
Working group	Engagement via pe-existing groups (for other projects, ongoing country activities etc) such as technical working groups or committees	✓✓ Most relevant to technical issues where technical working groups are specifically recommended to be established	✓✓ Useful for general coordination and review of strategic issues and decisions e.g. groups within the NCCC or Technical Task Force	✓ Relevant where a working group is formed to lead engagement
Use of the full range of the media	Internet, websites, online questionnaires, chat rooms and notice boards have become increasingly popular ways of providing information and seeking feedback. Facilitates engaging large number of stakeholders/ people and useful at reaching those who may be more difficult to involve	Not specifically recommended	✓ Most relevant for communicating outputs of the work and strategic decisions, e.g. vision statement, goals etc	✓✓ Very relevant for general engagement and communication

7.5 Recommended approach



7.5.1 Initial awareness raising

The first planned engagement activity is concerned with raising awareness amongst stakeholders on the LTS development activities. This may take the form of a one-day workshop, as described below. However, owing to COVID-19 related restrictions this may need to be delivered, at least partly, as a remote workshop.

Aim	<ul style="list-style-type: none"> • To raise awareness of LTS development process • To inform stakeholders of how they can contribute to the process • To secure buy-in from key stakeholders
Timescales	Month 1 ¹⁰³
Actors	Open to all stakeholders
Format	1-day workshop at a venue in Amman.
Content	<p>Indicative agenda:</p> <ul style="list-style-type: none"> • Introduction to Jordan's Long Term Strategy (LTS) <ul style="list-style-type: none"> ○ Why develop an LTS? ○ What is an LTS? ○ What are the steps in the LTS development process? • LTS development process <ul style="list-style-type: none"> ○ Timescales ○ How stakeholders can engage in the LTS development process • Key discussion points <ul style="list-style-type: none"> ○ Overall Vision for the LTS ○ Linkages with other on-going plans and activities.
Output	Workshop report summarising who was involved in the workshop and key discussion points

Seeking input to the LTS

Following the inception workshop, it will be necessary to gather specific inputs from key stakeholders to inform the LTS development. It will be necessary to agree the list of the key stakeholders (e.g. data providers). We suggest these are a prioritized based on the initial list of stakeholders identified in task 5.

It will also be necessary to agree the appropriate mechanism for engaging with these stakeholders. For example, they could be engaged as a single group or separate working groups could be convened to work on specific aspects of the strategy e.g. adaptation/mitigation, or potentially also by sector.

Aim	<ul style="list-style-type: none"> • To gather inputs from key stakeholder on specific elements of the strategy e.g. vision, mitigation, adaptation. • To validate key data and assumptions
Timescales	Month 2-8

¹⁰³ Note that the timeline in Section 10 assumes a c.6 month process of approvals and administration before an official launch, so this would be 'month ~6' in the timeline

Actors	Open to the key stakeholders only (list to be agreed with the World Bank and MoE)
Format	To be agreed. This may involve working group meetings on key elements of the LTS e.g. Vision, Adaptation, Mitigation.
Content	To be agreed
Output	A short note on the outcomes from the meeting(s)

The delivery of the meetings may also be affected by the COVID-19 restrictions. If so, some of the engagement may need to take place remotely.

Validation of the draft LTS

Prior to the finalisation of the LTS it will be necessary to engage with the stakeholders to seek feedback and validate the key elements of the strategy. At this point in the process the engagement will be with the key stakeholder only.

The validation would involve presenting the draft results to the key stakeholders for discussion. Relevant documents would be shared prior to the stakeholder meetings. The stakeholder meeting could take two forms:

- a) A single meeting for all key stakeholders, covering all aspects of the strategy
- b) Parallel meetings for each of the relevant working groups, covering the specific issues relevant to the working group

Aim	<ul style="list-style-type: none"> To seek feedback and further inputs from key stakeholder on the draft strategy To validate key data and assumptions
Timescales	Month 12-15
Actors	Open to the key stakeholders only
Format	Either a full day workshop at a venue in Amman for all stakeholders, with parallel sessions, or a series of short meeting with each of the respective working groups
Content	To be agreed
Output	A short note on the outcomes from the meeting(s)

The delivery of the meetings may also be affected by the COVID-19 restrictions. If so, some of the engagement may need to take place remotely.

Awareness raising on the final LTS

The final engagement activity concerns the launch overall final LTS. This activity is concerned with the engagement of a very broad spectrum of stakeholders, and is about raising awareness of the final strategy, and engaging stakeholders in the implementation of the strategy.

The final LTS will be launched at a stakeholder workshop. To support the workshop some additional communication material will be prepared e.g. brochure, summarising the overall strategy, or key elements of it.

Aim	<ul style="list-style-type: none"> To raise awareness and secure buy-in to the final LTS
Timescales	Month 18-24
Actors	Open to all stakeholders, but targeting stakeholder from the inception workshop
Format	Half day workshop at a venue in Amman, with associated technical workshop

	Communication documents (e.g. 2 pages brochure) summarising the overall strategy or specific elements of it
Content	<p>The launch event will present the findings, actions and targets of the LTS. The event will include a broad group of stakeholders, including representatives of key sectors, and will aim to secure ongoing support for the LTS.</p> <p>The launch event will be combined with a 1-day technical workshop, which will focus on the methods and approaches for the revision and updating of the mitigation and adaptation strategy.</p>
Output	<p>Workshop report summarising who was involved in the workshop and key discussion points</p> <p>Communication documents</p>

The delivery of the LTS launch workshop may also be affected by the COVID-19 restrictions. If so, similar options as presented for the launch workshop are relevant here also.

8 Engagement and empowerment of citizens as key LTS stakeholders

See Annex 6 for further information on citizen engagement

This section follows on from the previous on stakeholder engagement and aims to focus specifically on the engagement and involvement of citizens as a key stakeholder group.

Navigation

Regarding the “citizen engagement” element of the Roadmap, this section provides:



- [Role of citizen engagement in developing an LTS](#)
 - o A description of the role that this element plays in the LTS development.
- [International examples](#)
 - o Examples of how this was undertaken in the development of other LTSs.
- [Experience of citizen engagement in Jordan](#)
 - o A summary of Jordan’s approach to citizen engagement to date.
- [Jordan’s LTS – Recommendations for the citizen engagement approach](#)
 - o A summary of recommendations for implementing this element in the development of Jordan’s LTS
- [Challenges and bottlenecks](#)
 - o Potential challenges and bottlenecks to consider when developing this section.

This section is supported by [**Annex 6**](#) which contains further details.

8.1 Role of citizen engagement in developing an LTS



Globally there is an increasing shift toward greater citizen engagement in policy making. No matter how well-intended the policy maker, there will often be a gap between their perspectives and objectives, and those of the citizens they are said to represent. Further, there is the recognition that citizens have valuable local knowledge which should be included in policy making, to enrich its process and outcomes. In the context of the development of an LTS, the impacts of natural hazards and climate change, and solutions, are mostly local, therefore climate strategies must engage those most affected. Civil communities should set their own priorities and are best responsive to their needs. Therefore, in order to ensure that Jordan’s LTS is forward looking and robust, it must ensure that high-quality citizen engagement is integrated into its development and implementation.

Public engagement is important to ensure citizens are empowered in decision-making processes, resulting in better quality actions, citizens’ consent and trust, and more positive public attitudes and behaviours. On one hand, public participation can play an important role in actions to achieve climate goals. However, on the other hand, to achieve the desired effects, engagement needs to be carried out in a way that is meaningful for both the citizens and the governmental institutions involved. Citizen involvement is relevant at all stages of the policy cycle: at initiation of the long term strategy; while the strategy is being drafted (before & during LTS development where the rationale is that there is the need for citizen inputs to shape the strategy), after LTS finalization and publication where the need exists for citizens to be aware of the final strategy, and implementation where citizens must be involved in the implementing of the plans. Added to that, citizens must be involved in monitoring, evaluation, and eventually revising the strategy.

8.2 International examples

8.2.1 Framing of citizen engagement



“The World Bank defines citizen engagement as the two-way interaction between citizens and governments that gives citizens a stake in decision-making with the objective of improving the intermediate and final development outcomes of an intervention.”

In 2014, the World Bank Group produced the *Strategic Framework for Mainstreaming Citizen Engagement in World Bank Group Operations*¹⁰⁴. The guidance is helpful in framing citizen engagement and identifying opportunities and methods of support. Citizens are understood as the ultimate client of government, development institutions', and private sector interventions in a country. Citizens can act as individuals or organize themselves in associations and groups such as community-based groups, women's groups, or indigenous peoples' groups. Civil society organizations (CSOs) can represent citizens and can include organizations outside the public or for-profit sector, such as nongovernmental organizations (NGOs), charitable organizations, faith-based organizations, foundations, academia, associations, policy development and research institutes, trade unions, and social movements. In this context, the term citizen is not used in a legal sense but is understood in the broad sense of referring to all people in a society or country in an inclusive and non-discriminatory way. The document identifies a spectrum of citizen engagement which includes consultations, collaboration, and empowerment (see Figure 8-1). While informing citizens (Level 1 in the figure) is an important enabling condition, meaningful citizen engagement requires a two-way interaction to close the feedback loop and meet citizens' expectations for improved development outcomes based on their inputs. These dimensions must be integrated into a Citizen Engagement Action Plan that is focused on increasing the level of citizen involvement in decision making related to climate change, risk, and adaptation strategies and plans.

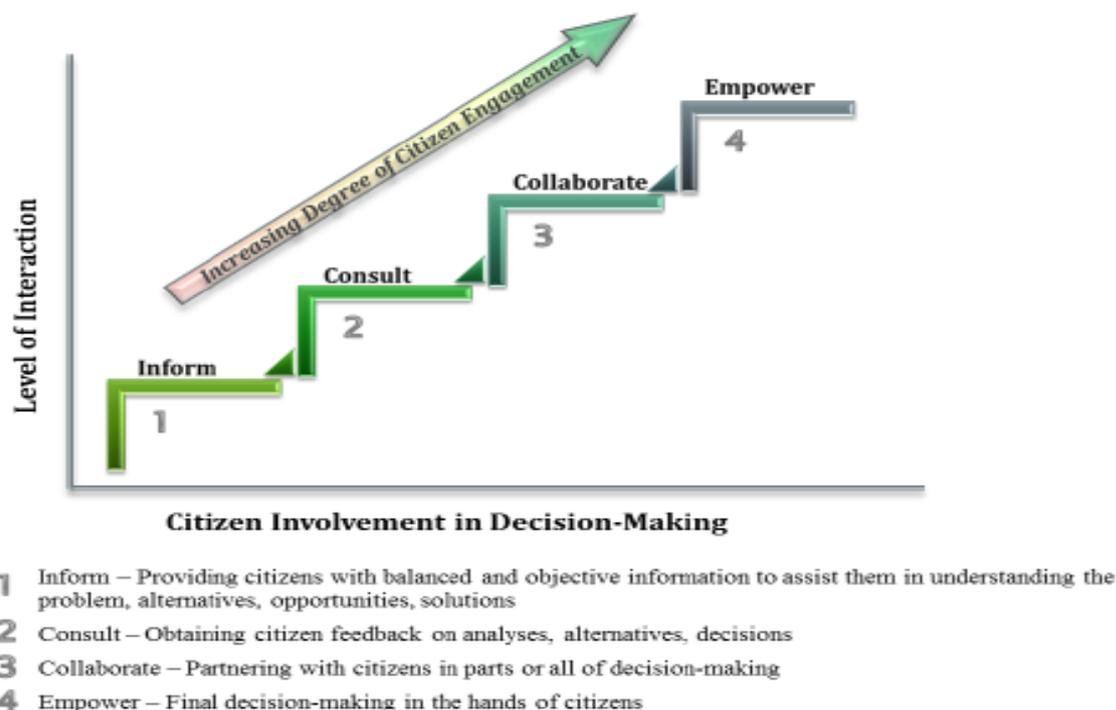


Figure 8-1: Dimensions of Citizen Engagement

Source: World Bank (2014)¹⁰⁵

¹⁰⁴World Bank Group (2014), Strategic Framework for Mainstreaming Citizen Engagement in World Bank Group Operations <https://openknowledge.worldbank.org/handle/10986/21113>

¹⁰⁵World Bank Group (2014), Strategic Framework for Mainstreaming Citizen Engagement in World Bank Group Operations <https://openknowledge.worldbank.org/handle/10986/21113>

8.2.2 Citizen engagement in existing LTS and climate policy development

To date, there are few examples of LTSs that have been substantially created via bottom-up citizen engagement processes; the majority of examples focus on consulting on outcomes only.

Table 8-1: Examples of citizen engagement in LTSs

Country / LTS	Citizen and stakeholder engagement process ^{106 107}
Singapore	During the LTS development process, inputs and feedback from relevant government agencies, academia, industry and civil society were collected through technology roadmaps, surveys, the public consultation on Singapore’s long-term low-emissions development strategy and various stakeholder engagements.
Fiji	The CCICD convened three National Stakeholder Workshops with key national and sub-national government, non-governmental, academic, and private sector stakeholders to inform them about the LEDS process and progress, and to solicit feedback to incorporate into the LEDS itself. The three workshops addressed: the development of Fiji’s 2050 vision for low emission development, both economy-wide and for each sector; scenario development in each sector, including business-as-usual (BAU), high ambition, and very high high ambition mitigation scenarios; and validation of findings for each sector.
Costa Rica	Non-governmental actors were consulted in the process of developing the long-term strategy. These included NGOs, the private sector (including industry chambers, agriculture and livestock groups, car importers, bus companies, truck owners’ association, companies, sustainability initiatives, and utilities), representatives from municipalities, and academia.
South Africa	In South Africa, business, industry bodies, civil society, labour, academia, local governments, and government agencies were involved in the scenario-building team. In addition, there were several high-level round tables for government (including the directors general of various government departments), civil society (including a dozen major NGOs, research, faith-based, and civic organizations), labour, and business. These round tables were aimed at communicating the LTMS results across the country’s leadership. Education is also emphasised as a core part of public awareness on climate change.
Germany	Representatives of states, local authorities, and associations (including trade unions and businesses) proposed measures. Scientific institutions helped to refine the proposed measures, and the Institute for Applied Ecology conducted impact assessments on the measures. In addition, about 500 members of the public, randomly selected, were included in citizens’ conferences that took place in five different cities. An online dialogue was open to everyone. Stakeholder groups also met in five thematic working groups. The participation process was designed by organizations that specialized in participation and process design, and the process itself was evaluated using analysis and interviews with participants
Mexico	There was no stakeholder engagement for the Mid-Century Strategy, but there was a public consultation process with NGOs and broader society for the Mexican National Strategy, which informed the Mid-Century Strategy.
USA	Due to the compressed timeline of developing the long-term strategy, the United States was unable to allow time for a formal notice and comment period, relying instead on structured discussions with the private and non-profit sectors, respectively,

¹⁰⁶ WRI (2019), ‘Good governance for long-term low-emissions development strategies’, <https://www.wri.org/publication/good-governance-long-term-low-emissions-development-strategies>

¹⁰⁷ LTSs – available here: <https://unfccc.int/process/the-paris-agreement/long-term-strategies>

	<p>in a few meetings. Those consulted included companies and NGOs that had been engaged with the administration over the prior 7 years of the administration.</p>
France	<p>In France, a consultative process for the preparation of the 2015 Transition Law created an ad hoc Council for the Energy Transition (CNTE), which was later institutionalized by law. This council included representatives from business, NGOs (environmental, social, and consumer organizations), trade unions, subnational authorities, and members of the National Assembly and Senate. A plenary of more than 130 representatives was created, which met monthly. In addition, the CNTE had a consultative body of 50 people with an equal share of representation of six constituencies: businesses, trade unions, environmental NGOs, caritative and consumer NGOs, local authorities (elected representatives), and members of parliament. Independent experts supported the plenary and working groups. The stakeholder consultation and national debate was not organized by the Minister, but an independent steering committee with five members of business, academia, and civil society. A citizens group was brought together to provide advice on the organization of the stakeholder process, the prioritization of issues discussed, and the review of public documents. The resulting law, adopted in 2015, mandates that a long-term strategy has to be prepared and revised every five years, in a consultative process with the CNTE.</p> <p>Education is emphasised as a core part of public awareness on climate change. The LTS for France also highlights the importance of young people of participating in low carbon activities, as eco-delegates, elected high school students, civic service, universal national service, youth movements, student associations.</p>
Czech Republic	<p>In developing the long-term strategy, a wide range of stakeholders was consulted. These stakeholders included business interest groups (e.g., the Confederation of Industry of the Czech Republic, the Czech Chamber of Commerce), local governments (Local Government Association), labour groups (The Bohemian-Moravian Confederation of Trade Unions, Association of Independent Trade Unions), central government entities (Czech Statistical Office, Czech Mining Office, etc.), environmental NGOs, and others, such as the Czech Academy of Sciences. These stakeholders commented on the final draft; some were consulted during the drafting process.</p>

Annex 6 contains more detailed examples of specific approaches. These include:

- **Public and stakeholder consultation:** projects such as Järva Dialog (in Sweden) where resistance to an urban regeneration project led to the creation of an inclusive and reiterative process of participatory decision-making¹⁰⁸; the ‘Delhi Dialogue’, which engaged 6 million people online and a further 8 million people offline through the use of volunteers, media and digital media¹⁰⁹ to crowdsource Delhi’s problems and solutions identifying a set of political priorities and actions which reflected the views of people from a wide range of backgrounds.
- **Education:** Rio de Janeiro’s (Brazil) engagement with schools through competitions and a ‘mascot’, and Chile’s Climate Change Education and Awareness Program that includes a Teacher’s Guide on climate change, the “La Plaza Imaginaria” animated series are all good examples.

¹⁰⁸ Climate KIC, Five ways of meaningfully involving citizens in climate action, <https://www.climate-kic.org/opinion/five-ways-of-meaningfully-involving-citizens-in-climate-action/>

¹⁰⁹C40 (2020), Good climate governance in practice. Mainstreaming climate action: case studies from leading cities, https://cdn.locomotive.works/sites/5ab410c8a2f42204838f797e/content_entry5ab410fb74c4833febe6c81a/5f7f892bb2744600adb12d18/files/C40_CaseStudies_new_v0.10.pdf?1613736426

- **Participatory budgeting:** Lisbon’s “green participatory budget” (the first of its kind) provides an example of allocating and distributing public resources according to the opinions of citizens, in the context of climate change adaptation and mitigation projects¹¹⁰.
- **Citizen Assemblies:** Deliberative events, such as citizen assemblies, can demonstrate the active role citizens can play in decision making and developing a consensus-based approach to dealing with difficult policy issues, such as climate change¹¹¹. The UK Climate Assembly brought together over one hundred citizens to discuss how the UK should reach net-zero GHG emissions by 2050, ultimately recommending that the UK’s path to net-zero should be “underpinned by education, choice, fairness and political consensus”¹¹².
- **Neighbourhood parliaments:** In India, there are over 400,000 local neighbourhood parliaments. Every household in a neighbourhood of 20 - 30 homes contributes a representative, who has a ministerial role in their parliament, and together they work on the projects they decide are most important for their neighbourhood, using the organising focus of the UN 2030 Sustainable Development Goals. Regarding climate change, these parliaments are making meaningful local impact encouraging low carbon behaviour change and devising innovative means of adapting to changing climates. Some local governments in the south of India now have specific programmes to support the creation of neighbourhood parliaments in every neighbourhood, given the significant positive impact they have on poverty reduction, mental and physical wellbeing, and climate change mitigation and adaptation.¹¹³
- **Interactive platforms:** The “Future Bristol Low Carbon 2050” platform¹¹⁴ was designed to allow citizens of Bristol (UK) to explore in depth two different scenarios to achieve the cities’ climate goals and vote on preferred futures.
- **Competitions:** Earth Hacks, for example, aim to “harness the power of hackathons to develop student-driven solutions to the climate crisis”¹¹⁵. They define environmental hackathons as “*fun innovating competitions, where students compete against their friends to design and develop technical solutions to our world’s pressing climate issues. A hackathon solution could be but is not limited to: software code, an engineering design, a public policy, a business plan, a community model, an art piece, or a website*”¹¹⁶.

¹¹⁰ Climate KIC, Five ways of meaningfully involving citizens in climate action, <https://www.climate-kic.org/opinion/five-ways-of-meaningfully-involving-citizens-in-climate-action/>

¹¹¹ <https://www.climate-kic.org/opinion/five-ways-of-meaningfully-involving-citizens-in-climate-action/>

¹¹² <https://www.climateassembly.uk/>

¹¹³ <https://www.thealternative.org.uk/dailyalternative/2020/4/26/neighborocracy>

¹¹⁴ <http://www.futurebristol.co.uk/scenariox/>

¹¹⁵ <https://earthhacks.io/>

¹¹⁶ <https://earthhacks.io/>



Figure 8-2: BEIS (UK) 'My2050 Calculator' website

Source: BEIS (no date)¹¹⁷

8.2.3 Citizen engagement through education

Since poor awareness of climate change issues amongst citizens and stakeholders is one of the obstacles for inclusive and effective citizen engagement (and actions) on this issue, public education on climate change should be considered as a key area that needs improvement. Education can be a key factor in promoting sustainable development, by helping people develop knowledge, skills, values and behaviours which enhance their understanding and appreciation of how sustainability means a better life for them and their communities. Significant work is already underway globally to promote education surrounding climate change and sustainable development, such as through UNESCO'S Education for Sustainable Development' program that could potentially be reflected in primary and secondary school curricula. Several LTSs, including those for South Africa, France and South Korea emphasize the role of education as a core part of public awareness raising on this issue. Other examples of educational citizen engagement include:

- **Rio de Janeiro's** (Brazil) schools engagement programme was designed to help teachers in Rio's public schools share sustainability concepts and actions with children, with the hope that they would in-turn share them with their parents and families. It had a mascot to enhance engagement and help build brand identity: suggested names for this mascot were submitted

¹¹⁷ BEIS (no date) My 2050 Calculator, <https://my2050.beis.gov.uk/?levers=1111111111111111>

by students through a competition among schools, and also through on-line voting at the portal PARTICIPA.RIO¹¹⁸.

- **Chile's Climate Change Education and Awareness Program** that includes a Teacher's Guide on climate change, the "La Plaza Imaginaria" animated series, and the Citizen carbon footprint calculator.¹¹⁹
- **Interactive online tools:** These provide an opportunity to engage citizens in the LTS modelling process. In the UK, for example, the Department for Business, Energy and Industrial Strategy (BEIS) produced an interactive "My 2050 Calculator"¹²⁰, where users can easily explore pathways to a low carbon UK by 2050 by adjusting the level of ambition of numerous sectors to produce their own pathway (essentially, a simple, user-friendly representation of the 2050 Calculator model).
- **Interactive platforms:** These can make climate change knowledge accessible to all and provide an effective way of engaging large numbers of citizens in the discourse surrounding climate change. HackAIR, for example, is an open platform that was co-created together with citizens to foster democratic participation in the measurement and understanding of air quality, ultimately aiming to raise collective awareness on the topic through local dialogue¹²¹.

Furthermore, education is the first step in deliberative citizen engagement initiatives like citizen assemblies. Only once their capacity is built through training and education on specialist topics, are they ready to make informed decisions, in a facilitated environment, on these topics.

8.3 Experience of citizen engagement in Jordan



Jordan has a diverse and active civil society. Many civic and charity groups and associations representing various interests exist and operate in the country. Many of them largely operate in certain areas of the country are related to the tribal framework in Jordan. Their work revolves round lobbying for increasing the allocation of national resources to their locality. Many Civil Society Organisations (CSOs) actively participate in national dialogues on political and socio-economic issues.

Within Jordan, citizen engagement experiences, particularly in donor supported projects, have usually focused around providing information and undertaking consultations (levels 1 and 2 in Figure 8-1) It is usually practiced in Jordan as part of a general stakeholder engagement heading. It basically includes major stakeholders from Government authorities, major NGOs; but little representation of the local community. For example, the Environmental and Social Impact Assessments (ESIA), requested by the Ministry of Environment for all kinds of projects, public scoping sessions were conducted in the Capital Amman far from intended projects. The Ministry of Environment would make the invitation list and invite them to attend. Local public invitations were limited to governmental authorities of the locality and may be local NGOs. More recently things are changing were these sessions are many times conducted on relevant locality of the project and open basically to the local citizens. Other times, surveys are conducted on local levels to engage CSOs and local citizens. **Annex 6** contains details of the citizen engagement requirements set out in various country strategies.

Many projects promoting citizen engagement and participation, especially women and youth, have been conducted with the assistance of many international organizations such as the World Bank, USAID, European Commission, Organization for Economic Cooperation and Development (OECD), and the International Union for Conservation of Nature (IUCN) among others in cooperation with local CSO and NGOs. These projects worked on the community levels and direct contact with citizens.

¹¹⁸C40 (2020), Good climate governance in practice. Mainstreaming climate action: case studies from leading cities, https://cdn.locomotive.works/sites/5ab410c8a2f42204838f797e/content_entry5ab410fb74c4833febe6c81a/5f7f892bb2744600adb12d18/files/C40_CaseStudies_new_v0.10.pdf?1613736426

¹¹⁹ <https://cntvinfantil.cl/series/la-plaza-imaginaria/>

¹²⁰ <https://my2050.beis.gov.uk/?levers=1111111111111111>

¹²¹ <https://www.climate-kic.org/opinion/five-ways-of-meaningfully-involving-citizens-in-climate-action/>

These mainly included training, capacity building, and communication with community members, with youth and women as the main targets.

Another direction where the Government of Jordan is moving is the use of e-Government and digital engagement. In the last ten years Jordan has been working to convert its services through internet where monetary services, documents, and communication with government bodies has been established. Digitization was also efficient in the private sector in Jordan including banking among others. Many supporters of e-Government around the world believe that this technology will enhance the engagement and participation of citizens in politics and government. The evidence is still weak in Jordan that socioeconomic developments and political participation will move hand in hand.

The preparation of the upcoming open government action plan for Jordan could serve as an opportunity to highlight climate, development, engagement and transparency issues and make a commitment to enhancing these, by adopting commitments such as:

- *Track and publicize climate-relevant policy implementation and results*, such as those associated with Nationally Determined Contributions, 2020 pledges, long-term low greenhouse gas emission development strategies and green growth/sustainable development strategies relevant for the SDGs.
- *Provide greater transparency of information on climate and sustainable development in national budgets*, such implementing cross-government budget systems and processes that enable the identification, tracking and regular reporting of domestic resources mobilized for low and high-emission activities.

Lastly, a coherent roadmap for the implementation of decentralised consultation is necessary to reach potential objectives. It should underline creating community leaders among local public officials and non-governmental stakeholders to orchestrate the character of the reform, raise awareness, provide training, reconcile increasing expectations among civil society and citizens to play a more active roles, and institutionalize partnerships with locals CSOs and citizens. It will ensure citizens can become active drivers of the national planning process and empowerment.

The main highlights and conclusions of citizen engagement in Jordan can therefore be summarised as:

- The type of engagement that has been happening in Jordan to date is usually stakeholder engagement rather than citizen engagement
- Citizen engagement is limited to and focusing mainly on 'inform' & 'consult'. Empowerment does not exist.
- Stakeholder engagement in Jordan included Government, private sector, NGOs, and CSOs; but has not made enough progress in involving citizens.
- Regulatory / legal structures exist but are narrow and lack enforcement where CE has not yet been happening on the ground.
- Opportunities such as those presented by e-Government, digital engagement and open government commitments might provide the tools for enhancing future engagement around the LTS and other similar processes.

8.4 Citizen Engagement Mechanisms

A variety of mechanisms exist for citizen engagement, spanning the range of levels of engagement, from *informing* and *consulting* to *collaborating* and *empowering* citizens. A few examples include:



- Informing e.g. public hearings and focus group discussions.
- Consultation e.g., public hearings, focus group discussions, structured surveys, and written and online submissions
- Collaboration e.g. citizen membership in decision-making bodies, participatory planning, and participatory or collaborative research.

- Empowerment e.g. participatory planning / budgeting, citizen ownership of projects through e.g. community benefit organisations

Table 8-2 lists possible mechanisms for carrying out these approaches (see 1st column) which are relevant in the context of citizen engagement in Jordan for the LTS.

Table 8-2: Citizen engagement mechanisms

Approach	Action	Targeted citizens	Responsibility	Time Frame	Measurement	Outcome	Budget
Inform	Media (TV, Radio, Newspapers) messages	General public	Communication Engagement Team Media partners	Initiation & ongoing	No. of messages	Increase understanding and promotion of citizens voice	Up to \$45k for a full media package
Inform	Develop a series of video clips and proactive tools that explain how the community and citizens can provide input	CSOs, NGOs, and local citizens & public officials	Communication Engagement Team Community Engagement	Initiation & ongoing Publication	Feedback No. of views per video clip and/or hits on relevant webpage	Increase citizens understanding of the climate change issues and policies.	
Inform	Community briefing meetings	CSOs and NGOs, local citizens	Communication Engagement Team Local government authority (Mayor, Governor).	Ongoing	Number of subscribers and their feedback	No. of briefings held. No. participating	Staff Time + \$1400/ day (JD1000)
Inform	Conduct capacity building seminars for engagement of local officials and citizens/ CSOs	CSOs , NGOs, local citizens and local public officials	Project managers (sectoral implementation leads)	Initiation & ongoing Lead by timelines of sectoral implementation plans	No. of participants. No. of seminars	Increase understanding of the climate change issues and policies.	Staff Time + \$1400/ day (JD1000)
Inform	Education in primary and secondary schools , and beyond	School children and adults in lifelong learning / general public	Educational ministries developing curriculums and schools	Initiation & ongoing	No. of school children and adults undertaking courses	Increase understanding of the climate change issues and policies.	

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Inform	Conduct community engagement seminars	CSOs , NGOs, local citizens & public officials	Communication Engagement Team Community Development	Annual	No. of seminars No. of participants Seminar feedback results	Increase citizens understanding of the climate change issues and policies.	Staff Time + \$1400/ day (JD1000)
Consult	Develop and sustain online communications	CSOs, local citizens & public officials	Information Technology Communication Engagement Team	Ongoing	No. of developed lines of communications	Increase promotion of opportunities for citizens to have a say.	Staff Time
Consult	Develop and promote newsletters to distribute information and ask for feedback	General public / affected citizens, NGOs, CSOs	Communication Team	Ongoing (regular schedule)	Feedback No. of participants	Increase citizens understanding of the climate change issues and policies.	Unclear, depends on scope and scale
Consult	Promote community participation in social media platforms	General public / affected citizens and CSOs	Community Engagement Team	Ongoing	Participation of committees No. of social media platforms	Increase promotion of opportunities for citizens to have a say.	Staff Time
Consult	Using websites to collect feedback and track suggested projects	CSOs, NGOs, local citizens	Information Technology Communication Engagement Team	ongoing	No. of projects No. of participants	Increase promotion of opportunities for citizens to have a say.	custom website development costs vary widely - \$5000 to \$50000+ depending on complexity and functionality
Consult	Develop and sustain Social media messaging groups (Facebook, WhatsApp,...etc)	General public and CSOs	Communication Engagement Team	Ongoing	Number of subscribers and their feedback	Increase understanding and promotion of citizens voice	Staff Time

Consult	Develop a citizen and CSOs led monitoring, evaluation	Affected citizens & CSOs	Communication Engagement Team	Ongoing (including future monitoring role)	No. of CSOs participation	Build trust among citizens and policy makers Increase citizens empowerment	Staff Time (significant)
Consult	Focal group, regional and national Workshops with relevant groups of stakeholders	Affected citizens, CSOs	Communication Engagement	Periodic – likely at initiation, during technical development and for validation	Feedback	Dissemination of information. Increase understanding of community leaders and promotion of citizens voice Feedback on priorities, technical elements	Staff Time + \$1400/ day (JD1000)
Collab/ Empower	Public Open Meetings on Community level Validation meetings, community and local level meetings, exposure visits	CSOs Local Citizens	Communication Engagement Team Government authorities Officials/Leaders	Periodic – likely at initiation, during technical development and for validation	Feedback No. of participants	Increase understanding of community leaders and promotion of citizens voice	Staff Time + \$1400/ day (JD1000)
Collab/ Empower	Citizen assembly or conference for the representative cross section of society	CSOs Representative cross section of society	Scientific bodies / universities	Ongoing (including future monitoring role)	Feedback No. of assembly meetings	Structured citizen monitoring and review process for input and validation	Costs vary considerably: Ireland >\$700k (>€600k) ¹²² Scotland \$2m (£1.4m) ¹²³

¹²² <https://www.irishtimes.com/news/ireland/irish-news/citizens-assembly-costs-run-over-initial-estimates-1.3138171>

¹²³ <https://www.scotsman.com/news/scottish-news/scotlands-citizens-assembly-cost-taxpayers-ps14-million-1404331>

Collab/ Empower	Dialogues / crowdsourcing ideas and policy solutions	CSOs General public	Communication Engagement Team Government authorities	Sporadic – for particular technical issues and needs	No. items of feedback received	Un-structured citizen inputs	Varies from free to high cost if using a moderated platform
Collaborate	Hackathons open to students or the public, for finding solutions to technological, policy or science issues for example. A good example is listed within https://earthhacks.io/	Students, businesses, general public	Communication Engagement Team	Usually held over a 24 hour period Sporadic – for particular technical issues and needs	No participants No outputs	Sets of solutions (usually technological)	Varies from free to high cost if using a moderated platform
Collaborate	Citizen representative groups should be part of the LTS steering committee	CSOs	NCCC	To participate in regular meeting schedule	Attendance at meetings Inputs provided	Representative voice included in highest climate decision-making body	Minimal
Empower	Citizen led local governance structures for governing local project implementation ¹²⁴ e.g. local community groups can make decision on how to spend adaptation funds locally, or supported in the creation of community enterprises for adaptation and mitigation solutions. This could be delivered through neighbourhood groups / governance structures.	Local community	Local government and/or project implementers	Longer term, post LTS development as part of implementation of actions	No. citizen led local governance structures	Creation of community-based decision making structures	Ideally ultimately self- financing or funded via project implementation
Collab/ Empower	Participatory budgeting	Local citizens affected by local government decision	Local government	Longer term, post LTS development as part of implementation of actions	No. of local governments using PB /yr and PB events / yr	Local citizen empowerment over local budgetary decisions	Cost of publicising & hosting regular e.g. quarterly meetings in town hall

¹²⁴ For example <https://www.tasc.ie/publications/the-peoples-transition-communityled-development-fo/>

8.5 Recommendations for the citizen engagement approach



This section draws on examples above and the experience in Jordan to date to present a recommended citizen engagement plan for Jordan's LTS development and implementation. Table 8-3 presents the LTS elements developed at each stage of the timeline, specifying for each which citizens should be engaged (who?), and how.

As shown in Table 8-2 and **Annex 6**, there are many possible ways of designing citizen engagement to *inform, consult, collaborate* with and *empower* citizens in decision making processes, but the guiding principle should be to increase the amount of citizen engagement, such that collaborative decision making with citizens, or even empowered decision making, are used wherever appropriate.

At the LTS development stage, the proposal is to:

- a) convene a **citizen panel** which will be informed (educated), consulted and part-take in collaborative decision making, plus,
- b) informing and consulting the general population through **informational campaign** and online voting platform.
- c) Specifically for the adaptation elements, informing, consulting and collaborative decision making with citizens who have **lived experience of the key vulnerabilities** that Jordan faces.

There is also a role for those who can provide **specialist knowledge and expertise** (researchers, academics, etc) and those who **represent citizen groups** (such as CSOs or community organizations), to facilitate the process of convening the citizen panel (and representatives of vulnerabilities), and build the capacity of the citizens (education) to enable them to make informed decisions through deliberation.

At the LTS implementation stage, a variety of engagement mechanisms can be used depending on the nature of the policy being developed or action taken, and again the tables above show which options exist. Specifically recommended however is the **integrating climate change education** into the national school curriculum.

Table 8-3: Suggested stakeholder engagement plan for the development and implementation of the Jordan LTS

Step	LTS Elements & processes
Pre-design stage Month 0-6	<p>Setting up the governance mechanisms– at this stage, the citizen engagement processes are to be finalised and working groups recruited.</p> <p>Recommend the appointment of at least one citizen panel, comprised of a representative sample of the general public of Jordanian society. Similar to the citizen assembly approach or working group, this panel of citizens will be employed to part-take in collaborative decision making regarding key decisions for the LTS development laid out below.</p> <p>The composition of the panel will be determined through a sortition process, to determine a representative sample of Jordanian society, in terms of gender, age, location, social class, race, religion, educational level, and possibly attitudes toward climate change.¹²⁵ An initial characterisation is below, however, more thorough analysis is required seeking advice from demographers / research bodies.</p>

¹²⁵ In the context of government or public participation, sortition uses stratified sampling so that the demographic composition of the sample matches that of the population. In general, the final selection of participants through stratified random sampling (sortition) is proportionately representative of the population on at least three dimensions — age, geographic location or area of residence, and highest level of education — and is composed of half men and half women. Retrieved Participedia.net, Sortition, retrieved 03/06/2021 on <https://participedia.net/method/5507>

	<ol style="list-style-type: none">1. Jordanians are about 70% and non-Jordanians are about 30%2. Urban population is about 90.3% and 9.7% rural.3. Women make about 47.5% of population. The ratio between males and females is 112.5 males per 100 females.4. Youth makes a high percentage of the population (0-19 of age are about 44%, 20-39 are about 33%, 40-59 are about 17%, and >60 are about 6%)5. Religious distribution includes 97.5% Muslims, 2.2% Christians, 0.4% Buddhist, 0.1% Hindu, and the rest is indifferent.6. Ethnic distribution include 69.3% Arab Jordanians, 13.3% Syrians, 6.7% Palestinians, 6.7% Egyptians, 1.4% Iraqis, and 2.6% Caucasians (Circassians, Chechens, and Armenians). <p>It is important to also acknowledge that Jordanian society includes persons with disabilities, elderly persons and migrants/refugees, and low income/informal, and agricultural workers. This is because the LTS would have implications for all of them and they have a part to play in climate change mitigation and adaptation. E.g. an estimated 11 to 15 percent of the population of Jordan suffers from a disability, analysis¹²⁶ by the UN outlines the impacts of climate change on persons with disabilities and the responsibilities of States and other actors in relation to disability-inclusive approaches on climate change.</p> <p>The citizen panel is recommended to comprise 30-60 citizens. Citizens should be invited to attend voluntarily and paid for their participation in the process. This could be convened with the support of one of these organizations, using the sortition process:</p> <ul style="list-style-type: none">- Jordan Federation of Environmental NGOs.- Jordan Hashemite Charity Organization (JHCO).- Phoenix Centre for Economic and information Studies. They produced the @Guide of Civil Society Organizations in Jordan (www.civilsociety-jo.net) in cooperation with the German Friedrich Eibert.- We Are All Jordan Youth Authority (AJYC) <p>Depending on the resources, more panels could be convened, e.g. 1 per governorate. If 1 panel per governorate is desired, it may be worthwhile to develop this under the umbrella of the Decentralized Governorate Counsels. The law of internal affairs (under preparation) will provide the legal support for such panels.</p> <p>The role of the citizen panel will be to learn through training by relevant experts (academics, research institutes, CSOs) on each of the elements of the LTS where their views are sought. Interpreters may be required to enable the participation of citizens with different language groups. They will then be facilitated through deliberative discussion, where each can share and consider others' views. Following this, they will reach conclusions on their views, which will be recorded and shared as a consultation, or vote on where decisions are required. The citizen panel should be considered a Tier 1, high priority stakeholder group, and partners in the decision making process with the government. In particular, if there is any decision they strong disagree with, this should not go ahead. Their decisions will be fed directly to the LTS steering committee, who must by committed to demonstrated how the citizen panel's views have been taken into consideration.</p> <p>Alongside the citizen panel, CSO and NGOs organisations (that can also be said to represent citizens) will form part of the stakeholder groups with</p>
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¹²⁶ <https://undocs.org/A/HRC/44/30>

	<p>the role of experts consulted throughout the LTS development process, which is dealt under the 'stakeholder engagement' section.</p>
<p>Design stage – strategic Month 6-12</p>	<p>Vision definition – citizen panel is trained by relevant experts in the stakeholder groups, such as leading climate CSOs, experts at the German Jordan University as well as the Energy Research Center at the Royal Scientific society. The citizen panel will then collaborate in deciding key components for the vision e.g. SDGs, mitigation, adaptation and economic priorities as a 'top down' framework for initial consultation, possibly complemented by 6 month informational campaign, explaining the purpose and remit of the LTS with links to further information online is advertised through mass media aiming to collect of feedback from the general public, using interactive and easy to use online voting and feedback platforms.</p> <p>Climate strategy – citizen panel citizen panel is trained (by the same CSOs and experts as before) and will collaborate in deciding priorities in terms of the pillars, and final LTS framework.</p>
<p>Design stage – strategic Month 6-18</p>	<p>Adaptation elements – review and update adaptation analysis</p> <p>This requires the engagement of citizens with knowledge and lived experience of climate impacts and adaptation strategies. As such, citizen groups from the most vulnerable regions and categories of citizens should be trained (by relevant CSOs and experts) consulted via the adaptation working group, in workshop format. Section 8.5.1 provides detail on how this could be done in practice.</p> <p>Vulnerable regions suffering from climate change impacts are distributed around Jordan. An example is the south of Jordan, Petra, which has seen annual destructive floods. In Amman, the Capital, downtown was susceptible to floods many times. Local community knowledge of how to deal with changing climate will be combined with expert knowledge from CSOs and universities as part of the adaptation working group.</p> <p>Identify adaptation priorities and / or approve pillars</p> <p>As before, citizens from vulnerable group or regions engaged through adaptation working group. Citizen panel also engaged at this point to learn about (trained by relevant experts and CSOs) and collaborate in decisions making on adaptation priorities / approve pillars.</p> <p>Identify options to enhance adaptive capacity</p> <p>As before, citizens from vulnerable group or regions engaged through adaptation working group.</p> <p>Mitigation elements</p> <p>Consultation on pathways outputs from the modelling – citizen panel also engaged to learn about and collaborate in decisions making on adaptation priorities / approve pillars.</p> <p>Climate change strategy</p> <p>Iteratively refine, elaborate and finalize pillars and actions based on the analytical work undertaken for the adaptation elements and mitigation elements – citizen panel engaged for final approval.</p>

<p>Post-design stage (implementation)</p> <p>Month 18-24+</p>	<p>Mainstreaming</p> <p>Work with entities to elaborate sectoral pathways and strategies –a key principle in the sectoral strategies should be a commitment to adopting high quality citizen engagement, to at least the level of collaboration as partners in decision making, if not complete empowerment, following the model used for the development of the LTS. This can use the mechanisms outlined in Table 8-2 and Annex 6. Specifically, integrating climate change education into the national school curriculum is recommended.</p> <p>Governance</p> <p>Establish a monitoring plan and revision process – as part of the periodic review process, evaluations of the effectiveness of citizen engagement in the LTS implementation in should be undertaken, and necessary actions taken to ensure the highest standard of citizen engagement is being practiced throughout the implementation of the LTS.</p> <p>Communication</p> <p>Consultation processes on the draft LTS - collection of feedback on the draft by the general public through a 6 month campaign advertised through mass media for the collection of feedback from the general public, using interactive and easy to use voting and feedback platforms. Following this, a final convening of the citizen panel to evaluate general public feedback and make any adjustments to the draft given this.</p>
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8.5.1 Citizen Engagement on Adaptation elements of the LTS

While the recommended citizen’s panel is suggested to be composed of a representative sample of Jordan’s population, the citizen groups involved in the adaptation working groups will need to be specifically representative of those with lived experiences of Jordan’s key climate change vulnerabilities in each of the sub-sectors shown in Table 8-4. Where there are differences in regions e.g. North and South, representatives of each region should be present. Examples of representatives include fishermen, populations with water supply shortage and farmers. Citizens can be invited to attend voluntarily and paid for their participation. This could be convened with the support of one of these organizations

- Jordan Federation of Environmental NGOs.
- Jordan Hashemite Charity Organization (JHCO).
- Phoenix Centre for Economic and information Studies. They produced the @Guide of Civil Society Organizations in Jordan (www.civilsociety-jo.net) in cooperation with the German Friedrich Eibert.
- We Are All Jordan Youth Authority (AJYC)

Table 8-4: Jordan’s key climate change vulnerabilities by sector

Sector	Sub-sectors (regions North or South)
Water	Water supply (S)
	Water supply (N)
	Surface water management (S)
	Surface water management (N)
	Groundwater management (S)
	Groundwater management (N)

	Water collection (S)
	Water collection (N)
	Wastewater treatment
Agriculture	Crops (N)
	Crops (S)
	Livestock (N)
	Livestock (S)
Fisheries	Marine fishing
	Aquaculture
Forestry	Public forest management (NW)
	Private forest management (N-highlands)
Ecosystems	Terrestrial ecosystems (S)
	Terrestrial ecosystems (N)
	Freshwater ecosystems
	Coastal ecosystems
Health	Physical health (S)
	Physical health (N)
Built Infrastructure	Other (Aqaba)
	Other (Amman/Salt)
	Buildings (N)
	Buildings (S)
Transport	Roads (N)
	Roads (S)
Energy	Electricity
	Gas (Aqaba)
Business	Sales and services (mainly Amman)
	Tourism (Petra, Dead Sea, Aqaba)
	Financial (mainly Amman)
Manufacturing	Plastics and plastic products (N)
	Plastics and plastic products (S)
	Other (N)
	Other (S)
Mining and Quarrying	Mining (N)
	Mining (SW)
	Quarrying (Jerash-Petra)

These citizens will be engaged in the following way, for each of the steps:

- **Review and update adaptation analysis** - citizens will report on their own vulnerabilities based on their lived experience, and validate the analysis
- **Identify adaptation priorities and / or approve pillars** - citizens state their own priorities based on their lived experience, which will inform the discussion on the pillars, and help identify the gaps in them, with the ultimate aim of prevent and increase in vulnerabilities and encourage their decrease.
- **Identify options to enhance adaptive capacity** – citizens will be asked, as representatives of vulnerable groups, what has prevented them from achieving the LTS vision, what barriers and challenges they face, and what can be done to overcome these.

Note, other stakeholders will be part of the adaptation working groups, including policy makers who have been involved in developing national and sub-national adaptation plans, and other relevant experts and organisations. As before, the citizen representatives as non-technical experts, will require capacity building (education) and facilitation in order to make informed decision through deliberation. Interpreters may be required to enable the participation of citizens with different language groups.

8.6 Challenges and bottlenecks



Table 8-5: Key challenges/bottlenecks related to citizen and stakeholder engagement in Jordan, and potential solutions.

Key challenges/bottlenecks in Jordan	Potential solutions
Poor awareness of climate change issues amongst citizens and stakeholders	Awareness/education campaigns, greater involvement of local governments/entities in planning
Citizen engagement in Jordan has often included only an inform and consult approach to solving environmental and energy impacts as indicated by the scoping sessions of the Environmental and Social Impact Assessments (ESIA) supervised by the Ministry of Environment.	In the last few years it has been apparent that Jordan has been striving through different guidelines and regulations toward decentralization and increased citizen engagement through collaboration and empowerment. New strategies and laws have shown more indication of moving toward these processes and targets. These should be utilised as far as possible for a more collaborative and empowering approach.
Government council led engagement has faced challenges including: <ul style="list-style-type: none"> The Government did not provide the necessary tools for the GCs to accomplish its objectives. There is still a significant legal gap between approving and implementing projects and plans. The community as well as GC elected members perception and understanding of the council's duties, jurisdiction, and limitations is a big challenge, especially in distinguishing between the services provided by the municipality and the services provided by the GC. 	In 2015, Jordan produced the Jordan decentralization law where Government Councils in the 12 governorates of Jordan were elected based on this law to act as a subnational bodies closer to the community citizens. With the approval of this law, the government has undertaken the first step towards the promotion of a more bottom up approach from citizen to service provider to the identification of service needs and policy priorities, based on the role of the new elected councils in the municipalities and governorates. However, in practice, the challenges still largely remain.
Regulatory overlaps regarding powers and jurisdictions of GCs and other governmental bodies exist especially with the Ministry of Interior, Ministry of Public works, and Ministry of Local affairs	The LTS engagement plan should seek to establish a clear set of powers and authorities for engagement activities
In the last ten years Jordan has been working to convert its services through internet where monetary services, documents, and communication with government bodies has been established. Digitization was also efficient in the private sector in Jordan including banking among others. Many supporters of e-Government around the world believe that this technology will enhance the engagement and participation of citizens in politics and	Ensuring that engagement activities are inclusive and accessible to all will be important and should therefore not rely on digital tools and technologies only. Ensuring that stakeholders in all segments of society and in all areas of the country can be reached will be key. This means that community meetings and more traditional activities should be prioritised alongside new technology-focussed engagement methods.

government. However, the evidence is still weak in Jordan that socioeconomic developments and political participation will move hand in hand

9 Implementation of the roadmap



This section sets out the main steps Jordan will need to take to elaborate the contents of this report and Annexes, into the LTS. It is not exhaustive and does not outline every step but provides high level guidance on the process to develop the LTS. Each section of this report outlines how Jordan could develop the elements of the LTS so the detail is not replicated here.

Navigation



Regarding the “implementation” element of the Roadmap, this section provides:

- **LTS development process**
 - o An insight into the steps needed to develop the LTS and their interaction, and future updates of the LTS.
- **Resource needs**
 - o A summary of the resources needed to develop Jordan’s LTS.
- **Timeline**
 - o An overview of the timeline for Jordan’s LTS development.
- **Table of contents**
 - o A suggested table of contents for Jordan LTS.

This section is additionally supported by **Annex 8** which details MRV system for tracking the implementation of the LTS.

9.1 LTS development process



The diagram below outlines the main stages and steps recommended for the process of developing the LTS. These are described below.

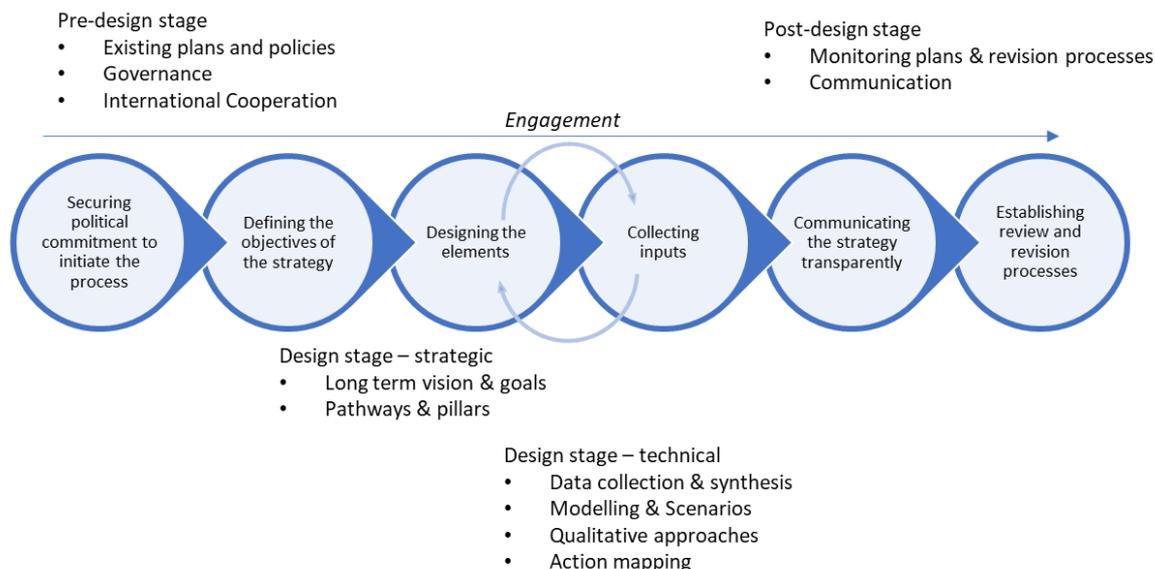


Figure 9-1: Example of an LTS development process

Source: Developed by Ricardo Energy and Environment

9.1.1 Steps to develop the LTS: pre-design stage (0-6 months)

The below tables set out a high-level summary of the main steps and tasks to be undertaken in the implementation of this LTS roadmap. This is not exhaustive, and is not prescriptive, and the relevant sections should be consulted for further recommendations. A more detailed project plan should be drawn up at initiation; this is intended to be a helpful guide to activities needing to be considered at key points in time and the phasing and interaction of activities presented discretely in each section of this document.

Element	Step
Governance – approvals and support	The Ministry of Environment to seek high level approval from the NCCC Steering committee to initiate the LTS process.
	Secure commitment from political leadership to provide the political and strategic steer and mandate to commence work.
	Initiation of approvals process to develop a new national strategy. This will likely involve: <ol style="list-style-type: none"> 1. a proposal to request support for enabling activities 2. approvals from MoPIC (entity responsible for channelling international funds).
	Identify and secure international cooperation, particularly international financial and technical support required.
Governance – personnel and structures	Approval and arrangements of teams – identification of national experts and drafting of terms of reference etc
	Issuance of recruitment notice to fulfil any resource needs and gaps including climate focal points within other key ministries.
	Identification of necessary working groups and technical teams including review of capabilities required, capacities, gaps.
	To also include a gender task force and appointment of a citizen representation panel.
	Issuance of tenders for implementation and for recruiting national project managers/experts as required.
	Appointment of the Technical Task Force to lead the LTS development. Ensure resources are available and all necessary access and information e.g. stakeholder/contacts database established; computer equipment obtained
	Identify capacity building needs and plan for capacity building activities (i.e. work with international organisations to provide this support)
	Publish institutional structure for the LTS including any changes to the NCCC required, and any new bodies e.g. scientific steering committee etc.
Governance – monitoring & management	Ministry of Environment to invite ministry and other stakeholders to nominate gender focal points to form a gender taskforce.
	Update/elaborate the project plan for development of the LTS.
	Establish a system for data and information management e.g. central cloud storage system
National Circumstances - scoping	Agree reporting for the LTS development e.g. meeting schedule, lines of reporting from technical working groups to technical task force (via CCD) to the NCCC.
	Review of information available for the LTS: <ul style="list-style-type: none"> - Note that this report provides significant input on the details, options and inputs that are required which will feed into the pre-design stage

	<p>Review and update information that is available and the existing gaps, to map input needs and identify required stakeholders.</p> <hr/> <p>Update of the information available for the LTS, for example, reviewing newly available/published strategies (as outlined in Annex 2).</p>
Vision - scoping	<p>Define the strategy's objectives and scope</p> <ul style="list-style-type: none"> - Working with stakeholders as defined in the stakeholder engagement plan, and including the citizen panel and steering committee, to identify initial objectives for the LTS as a framework for more in-depth engagement and clear communication about what the LTS is aiming to achieve. - The themes and vision (as outlined in Annex 2) could provide a starting point for gaining initial inputs and agreement.
Engagement and coordination	<p>Initiate communication with key stakeholders to advise of the beginning of the process and input needs – i.e. broad cross-ministry stakeholder kick-off workshop with representatives of all sectors, local governments, private sector, non-state actors and citizen panel.</p> <p>Citizen engagement processes are to be finalised and working groups recruited with the appointment of at least one citizen panel.</p> <hr/> <p>Initiate communications plan - public media campaign including international communication of Jordan's intention to develop its LTS and the objectives of this, in order to build momentum.</p> <hr/> <p>Align with ongoing related climate activities in Jordan to initiate knowledge sharing and coordination e.g. NDC update, BUR2, NC4 etc. E.g. round-table/workshop</p> <p>Consider establishing an informal MOU or other agreement to coordinate activities</p>
Capacity building	<p>Identify capacity building needs for technical, coordinating and supporting teams/task forces (e.g. gender task force, citizen panel, technical task force, technical working groups)</p>

9.1.2 Steps to develop the LTS: design stage – strategic (6-12 months)

Element	Step
National circumstances	Align with ongoing work on the NC4, BUR2, climate policy etc. to ensure data and information is consistent and most recent
Vision	<p>Define key components for the vision e.g. SDGs, mitigation, adaptation and economic priorities as a 'top down' framework for initial consultation</p> <ul style="list-style-type: none"> - Review existing visions, strategies and development priorities - Seek agreement on the scientific consensus regarding international commitments and actions – defining a mitigation commitment - Agreement on climate adaptation and sustainable development priorities <hr/> <p>Undertake citizen and stakeholder engagement to ensure inclusivity and consensus</p> <ul style="list-style-type: none"> - Consultation of the citizen panel, possibly complemented by media campaign with options for online feedback and voting by the general public. <hr/> <p>Definition of the LTS vision and communication including mitigation goal, adaptation goal and national development goals</p>

Climate strategy	Review and initiate updates of the adaptation and mitigation pathways analysis (to be addressed further in <i>design stage – technical</i> , below).
	Review of technical analysis of mitigation and adaptation pathways to identify priorities to enable the formation of pillars / confirm pillars
	Consultation and confirmation of priorities in the form of pillars for the LTS
	Agree action criteria <ul style="list-style-type: none"> - The suggested criteria (as outlined in section 5.5.4) can be used as a starting point. - These should be adjusted further to Jordan's needs if needed and ensure they are aligned to the agreed vision and pillars.
	Publish the LTS framework – vision, pillars and action criteria
Further stakeholder and citizen engagement / consultation as per the defined engagement plan.	

9.1.3 Steps to develop the LTS: design stage – technical (6-18 months)

Element	Step
Adaptation elements	Review and update the adaptation analysis (vulnerability and risk assessment) with stakeholders: <ul style="list-style-type: none"> - add new data and assumptions derived from the BUR2/NAP/NC4/Climate policy processes or other recent work - review sectoral documentation not labelled as “vulnerability assessment” or climate related, but which may provide information on the sensitivity and adaptive capacity of a sector - consult stakeholders in country via adaptation working group (incl. national and subnational levels, youth, CSOs and women) through workshops, where breakout groups provide vulnerability and risk ratings from 1-5 according to lived experiences and knowledge - update vulnerability assessment and confirm final scores via adaptation working group
	Identify adaptation priorities and/or approve pillars: <ul style="list-style-type: none"> - review suggested priorities and pillars in line with changes made to the vulnerability and risk assessment - consult stakeholders in country via adaptation working group (incl. national and subnational levels, youth, CSOs and women) to confirm that the pillars are exhaustive and cover all adaptation priorities - engage with mitigation working group to identify synergies in pillars and ensure mitigation pillars are not hindering progress towards adaptation - agree on one integrated list of pillars and map out contribution to mitigation and adaptation objective
	Identify options to enhance adaptive capacity, strengthen resilience, and reduce vulnerability: <ul style="list-style-type: none"> - consult stakeholders in country via adaptation working group (incl. national and subnational levels, youth, CSOs and women) through workshops to identify ongoing and suggested long-term actions under each pillar - map options for long-term actions against sensitivity, adaptive capacity and exposure they address - Identify and fill in potential gaps arising from the mapping exercise
Mitigation elements	Gather and review data on GHG emissions and mitigation including latest GHG inventory, projections/mitigation analysis for the BUR2/NAP/NC4/Climate policy etc.

Modelling and mitigation strategy	Define data needs, gaps, and implement a data collection plan
	Develop a simple spreadsheet tool based on the 2050 Calculator (or GACMO) to visualise pathways <ul style="list-style-type: none"> - identify experts in country - identify international support and training needs - develop the model
	Engage stakeholders and technical experts (via mitigation working group) on pathway options to identify <ul style="list-style-type: none"> - when emissions should peak - to what level emissions will decline to and when (whether total phase out i.e. net zero) - a realistic rate of reducing emissions, so that the annual rate of emissions decline and any increase in carbon removal is feasible - likely technologies and feasibility of different options in a Jordanian context
	Engage with adaptation working group to identify synergies in pillars and ensure adaptation benefits are maximised and to minimise maladaptation
	Based on feedback, take forward into a more comprehensive modelling exercise to optimise pathways using preferred modelling tool(s)
	Consultation on pathways outputs from the modelling
	Refine pathways, pillars and actions based on consultation responses
	Revisit future modelling needs <ul style="list-style-type: none"> - Decide whether an independent method of assessing the technical potential of different mitigation measures and of identifying the optimum pathway from an overall economic perspective is needed and if so, initiate a hybrid model process based on the TIMES model (recommendation). - This typically takes at least 2 years so this option should be revisited after the draft strategy is ready.
Climate change strategy	Identification of priorities – in the form of pillars (including sectors) for the LTS (as per <i>steps to develop the LTS: design stage – strategic</i>)
	Identification of long-term options for mitigation and adaptation, for each pillar <ul style="list-style-type: none"> - review short- and medium-term actions and priorities - assess gaps between short- and medium-term actions and long-term goals, drawing on the vulnerability and risk assessment and mitigation pathways analysis to identify long term actions - Mapping to sectors for implementation
	Consideration of the synergies between mitigation and adaptation responses, co-benefits of mitigation actions for adaptation/resilience and vice versa
	Define action criteria (and potential weightings (as outlined in section 5.5.4) to ensure that mitigation actions do not generate maladaptation, and mitigation benefits of adaptation actions can be maximised. Work with the gender taskforce to ensure approaches (e.g. GAMMA) are used to assess actions consistent with key priorities.
	Iteratively refine, elaborate and finalize pillars and actions based on the analytical work undertaken for the adaptation elements and mitigation elements
Capacity building and training	Implement planned ongoing capacity building for technical, coordinating and supporting teams/task forces as required (e.g. gender task force, citizen panel, technical task force, technical working groups)

	Build capacity at all levels to design and implement gender responsive climate change policies, strategies and programs. Set up a climate and gender portal to provide access to key information.
MRV	<p>Compile, document and store the LTS data and information. Implement identified opportunities to connect LTS MRV to the national MRV system.</p> <p>Establish a tracking system for climate interventions and ensure data collected is at least sex and age disaggregated.</p>

9.1.4 Steps to develop the LTS: post-design stage (18-24+ months)

Element	Step
Mainstreaming	<p>Work with entities to elaborate sectoral pathways and strategies based on the</p> <ul style="list-style-type: none"> - Identified pillars and actions - Adaptation & mitigation analytical work including how to take forward specific policies/measures - Milestones - Needs (capacity, resources, finance/investment strategies, technologies) <p>Entities to develop and issue LTS response plans / update and integrate LTS vision and pillars into future sectoral strategies</p>
Governance	<p>Establish a monitoring plan and revision process</p> <ul style="list-style-type: none"> - Institutional responsibilities and processes post-design should be defined - Specify the “what,” “when,” “who,” and “how” of monitoring <p>Formalisation of a permanent gender taskforce structure and functions</p>
Communication and outreach	<p>Consultation processes on the draft LTS - collection of feedback on the draft by the general public through a 6 month campaign advertised through mass media for the collection of feedback from the general public, using interactive and easy to use voting and feedback platforms. Following this, a final convening of the citizen panel to evaluate general public feedback and make any adjustments to the draft given this.</p> <p>Communication of the final LTS and launch</p> <p>Implementation of planned awareness raising, capacity building and strengthening of rural women and all citizens to communicate and respond on climate change</p>

9.1.5 Future updates of the LTS

The question of future updates of the LTS should be considered in planned for during the process of development. There is no requirement or rules around the updating of an LTS and so these recommendations are based on reflections of what might be good practice.



The LTS needs to balance being a ‘living document’ with providing long-term certainty, direction and commitment to a vision. Arguably, a vision should not need to change and only the strategies to deliver it will, as only implementation over time will tell which strategies will be successful or not, what technological shifts and breakthroughs will occur, and what other economic and social developments will materialise. This will require a continuous process of engagement and update to ensure that the latest knowledge is always accounted for, which also needs to align with policy implementation and planning at the sectoral level. This means that future revisions of the LTS are necessary and important.

The LTS should therefore adapt through time as assumptions are tested and new information is gathered, but, at the same time, other components must remain at the core. The strategy is ultimately about the vision and changes to this vision would mean another strategy.

It is therefore useful to define a review and update cycle. The NDC process provides a good opportunity for this. The five-year revision cycles for Parties to submit their NDCs to the UNFCCC provide an opportunity to improve the alignment of countries' long-term visions (LTSs) with their medium-term targets (NDCs). This way, policy makers can ensure that a country's long-term vision informs the NDC target setting for the medium-term and incorporating the latest developments in science, policy and technology. Without ensuring such consistency, LTSs run the risk of not being adequately mainstreamed into policy and implementation planning¹²⁷. Furthermore, in many countries, the development of LTSs has not happened in time to inform the NDC target setting of 2020. Looking ahead to future revision cycles beyond 2020, policy makers can proactively steer climate policy planning processes to align NDC revisions mandated by the Paris Agreement with updates to the country's long-term vision outlined in the LTS. For example, policy makers could align processes in a way that LTSs will be updated in regular five-year intervals to inform future NDC submissions. Ukraine, the Republic of Marshall Islands and France have already included statements of intention to review and revise their long-term strategies at least every five years in their LTSs submitted to the UNFCCC prior to May 2020.

Table 9-1 Suggested LTS update approach

Future status	update LTS components
Fixed components	Vision: The vision must remain at the core of the LTS and should be 'fixed', in order to ensure there is certainty, direction, and commitment that can transcend short term changes and stresses (economic, political social etc). Updates to the vision should be avoided, at least in the shorter term. Updates to the vision might be useful at a fixed point in the future (mid-way for example) where science, society and the economy may have changed to the extent that the vision is no longer as relevant as it could be
Components benefitting from review over time	<p>Climate strategy and pillars: The proposed climate pillars approach is intended to set a long-term framework that is exhaustive of climate and development needs to achieve the vision, and provides an overarching framework and set of key action areas that informs short and medium term actions. The pillars should also be developed and agreed via engagement and consultation processes that provide stakeholders with a level of commitment to their longevity. With this in mind, it is not recommended that the pillars are updated regularly, but it is likely that future adjustment will be needed to ensure they are always fit for purpose. This might be undertaken to align with other long-term strategic planning processes, typically around the 10-year mark.</p> <p>Institutional and governance arrangements: Institutional and governance arrangements for the LTS are recommended to be, as far as possible, fixed (whilst acknowledging the need for review to ensure they are fit for purpose). This provides certainty of roles and responsibilities, supports the mainstreaming and institutionalisation of the LTS, permanence of roles, and ensures there is clarity and commitment from all parties. Allowing for frequent change to institutional structures can make the process more vulnerable, for instance to losing knowledge and undermining processes and commitments. It is therefore recommended that Jordan commits to implementing structures that are 'as fixed as possible', with the caveat that monitoring and evaluation of effectiveness can be undertaken to ensure they are always fit for purpose.</p>
Components recommended to be regularly	Climate action criteria: The proposed criteria and approach for selecting (and optionally prioritising) climate actions under the climate pillars is intended to aid integration into short- and medium-term plans and strategies. Ensuring these criteria remain relevant will mean their regular review is

¹²⁷ GIZ (2020), "Making Long-Term Low GHG Emissions Development Strategies a Reality. A guide to policy makers on how to develop an LTS for submission in 2020 and future revision cycles": https://2050pathways.org/wp-content/uploads/2020/06/GIZ_NewClimate_LTS_GuideForPolicyMakers_2020.pdf

reviewed and updated	<p>useful. Updating criteria too dramatically and too often risks causing confusion and undermining the process however, and so this is recommended to be undertaken no more frequently than to align with the NDC cycle and to focus more on the details of scoring above the criteria themselves.</p> <p>National Circumstances: It is recommended that national circumstances be reviewed and updated periodically, to reflect the latest data and information on the country. This information can be obtained from the National Communication process if aligned.</p> <p>Engagement and consultation processes: Engagement and consultation on the LTS and climate actions should be an ongoing process, to ensure it is not viewed as a 'one off activity' or 'tick box' exercise and to provide feedback on implementation. Regular review and update of engagement processes and the plan for this will be key to ensure they remain meaningful, and are built on over time and reflect new knowledge and experience (especially developing concepts of citizen governance etc).</p> <p>MRV: Monitoring should be an ongoing process, and MRV of the LTS can be integrated into the domestic MRV system. Additionally, simple measures to support future development and update should be built in to the process for example, through actions such as documentation and archiving of materials and data, and institutionalisation of knowledge through capacity building and training.</p>
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9.2 Resource needs



Given the large amount of uncertainty in the scope of the LTS and the desired level of detail in analysis of pathways and actions for example.

There are also a large number of elements that relate to governance and existing systems, for which it is challenging to identify the specific nature of the human and financial resource needed.

Implementation of the LTS will require financial and human resources for all elements and at all stages of the LTS development. Resource needs will be determined by the scope, scale and approach, data collection needs, and the balance of in-house vs national experts vs international experts. At this stage, we therefore set out some indicative needs for some *selected elements* and propose that additional resource needs are explored further with stakeholders.

LTS development element	Human resources	Financial resources
Modelling	<p>Availability of experts with required modelling skills (or ability to train). Ideally in house but may need to be supported by international experts.</p> <p>Data collection for modelling needs must also be factored in</p>	<p>Cost of the model licence varies: Markal \$3,500-\$15,000 TIMES \$20,000 per year ENPEP-BALANCE free to all users LEAP Free to NGOs, governments and researchers in non-OECD countries (c\$5k for consultants)</p> <p>Technical support may come at additional cost if international support is required and will vary dependent on the nature of the model selected</p> <p>Indicative costs:</p>

		<p>From \$100,000 (assuming free model and basic support for 1 year with minimal data collection costs)</p> <p>> c.\$200,000 for 10-year TIMES licence plus \$500k-\$1m for extensive programme of technical support and operation over the period</p> <p>Indicative budget c.\$500k</p>
Citizen Engagement and communication	<p>Extensive citizen engagement will need a dedicated team.</p> <p>Workshops, events and community engagement will require travel, facilitators, a team to coordinate and feedback.</p>	<p>Citizens Assemblies may cost between \$350k-\$500k depending on scope and scale</p> <p>A bespoke website might cost upwards of \$50k</p> <p>A full media package for public engagement costs in the region of \$45k (JD30k) and several of these might be needed</p> <p>Workshop expenses are usually budgeted at \$1400/ day (JD1000)</p> <p>Expert staff time (Jordan) is usually budgeted at \$2-3000/month</p> <p>Indicative budget c.\$500k</p>
Capacity Building and technical assistance for Ministry of Environment and nominated experts	<p>Experts and ministry teams in Jordan require capacity building and support in order to understand and develop the technical elements of the LTS</p>	<p>Indicative costs:</p> <p>Expert staff time (Jordan) is usually budgeted at \$2-3000/month</p> <p>International expert time could be in the range of \$1-2000/day depending on experience and skill set</p> <p>A typical 2-year capacity building programme for a country focussed on climate policy development might be in the range of \$500k-\$750k</p> <p>Indicative budget c. \$500k</p>

9.3 Timeline

The next page provides an indicative timeline for the implementation of the LTS development tasks. Please note this is only indicative and not exhaustive of all required tasks, but seeks to identify the main elements of the work programme and supporting processes that will be needed in order to aid development. This shows a 2-year timeframe for the development, factoring in an initial 6-month period for initiation and approvals. Depending on the speed of this and the level of details/technical analysis required for each of the elements, the timeline could be significantly condensed or extended.

9.4 Table of contents

The below table of contents has been drafted as a guide for the LTS drafting.



Table 9-2: Draft Table of Contents

#	Chapter titles	Chapter content examples	Pages
-	Executive summary	<ul style="list-style-type: none"> Summary of the principal elements of the strategy Inclusion of 1 or 2 simple visuals relating to the principal elements 	2-3
1	Introduction and vision	<ul style="list-style-type: none"> Outline of the vision for Jordan's LTS, including the specific goal or target Vision would include adaptation, mitigation and the sustainable development considerations Description of the need, process for development and plans for future development of Jordan's LTS 	3-5 pages
2	National Circumstances	<ul style="list-style-type: none"> Country context (geography, history, population, economy, regional context and challenges, socioeconomic and ecological trends) National development goals (e.g. achievement of SDGs) Summary of climate change context (risks, trends, emissions, priorities, actions) Climate adaptation and mitigation strategic priorities, the existing NDC and NAP process and linkages, and Governance of climate change 	10-15 pages
3	Climate Change risks and vulnerabilities	<ul style="list-style-type: none"> Areas of high vulnerability, sectors and ecosystems, Areas of associated high climate sensitivities and low adaptive capacities Climate impacts and risks Adaptation options, reducing vulnerability, contributing to national development goals Adaptation pillars, policy recommendations, priority actions 	10-15 pages
5	GHG emission sources and sinks in Jordan and mitigation strategy	<ul style="list-style-type: none"> Description of primary sources and sinks of GHG emissions in Jordan Existing Policy and Regulatory Framework Estimations of GHG reductions Construction of the baseline scenario, and mitigation scenarios Mitigation pillars, policy recommendations, priority actions 	10-15 pages
6	Long-term climate strategy	<ul style="list-style-type: none"> Description of Jordan's long-term climate change pillars and rationale Short- medium- and long-term climate actions for each pillar and associated benefits (SDGs etc) 	10-15 pages
7	Society, economy and sustainability	<ul style="list-style-type: none"> Description of the impacts of the climate strategy on: <ul style="list-style-type: none"> Gender, youth, equity and justice Sustainability and biodiversity impacts Green economy impacts 	5-10 pages
8	Institutional arrangements and LTS M&E	<ul style="list-style-type: none"> Institutional arrangements and Governance Framework for Monitoring and Evaluation of the LTS 	5-10 pages
-	References		

-	Appendices / Annexes	<ul style="list-style-type: none">• Description of modelling approach, main assumptions and data sources• Details of the risk and vulnerability assessment• Explanation of criteria for climate actions• Further details of climate actions as desired e.g. financing strategy	
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APPENDIX: Gaps and limitations in Jordan's climate response

This Appendix aims at providing a brief description of the constraints and gaps identified during the previous prepared national climate change communications and the Biennial Update Reports. It will also identify newly arising constraints and gaps, and needed actions and resources required to overcome them. This will be relevant to the practical undertaking of the LTS.

A1.1 Institutional Constraints and Gaps and Policy Mainstreaming

The Climate Change Directorate at Ministry of Environment, as UNFCCC focal point, plays a pivotal role in climate change activities at the national level. However, the directorate needs strengthening in term of human resources and sustainability. It is recommended to increase the number of the staff and enhance their capacity to be able to carry out their huge responsibilities in the long term.

Although the climate change bylaw was issued in 2019, it is not fully functioning yet. Up to date, the number of meetings, between the NCCC and the technical teams is not sufficient and no major decisions have been taken on the ground. Also, there are entities identified in Annex (3) of the bylaw who are responsible for providing needed data for the greenhouse gas (GHG) inventory estimation, however, only a slight improvement was detected in providing and facilitating collection of data and still more collaboration is needed.

A1.2 Technical and Capacity Building Needs

The following are the technical capacity-building needs related to climate change GHG inventory reporting and GHG mitigation analysis which should be addressed urgently:

- Develop technical capacity for data collection and estimation of GHG emissions;
- Develop technical capacity to perform key source category analysis, particularly capacity-building needs for executing level and trend analysis, and to use the outcomes of the key category analysis;
- Enhance technical capacity to conduct ongoing surveys to provide accurate data and to integrate climate change questions in existing energy surveys that mainly focus on energy;
- Enhance capacity for data collection, project labelling and tracking information for reporting the technology support received;
- Enhance technical capacity for developing national emission factors and using higher tier methods in the categories defined as key and particularly in the AFOLU and waste sectors;
- Enhance technical capacity to report on mitigation actions that are already implemented or ongoing across all sectors;
- Enhance technical capacity for establishing a verification and tracking system of GHG reductions for various mitigation actions across all sectors;
- Enhance capacity in reporting progress and the underlying steps envisaged for the planned mitigation actions and when they will be implemented;
- Enhance capacity for analysing emission reductions during the implementation period for each mitigation action.
- Stakeholders had limited expertise and knowledge capacity for conducting mitigation analysis for the transportation, IPPU, AFOLU, and waste sectors.
- The complex nature of mitigation actions and initiatives that are being developed and implemented within the UNFCCC had been a challenge. The various potentials and features of Clean Development Mechanism (CDM), Nationally Appropriate Mitigation Actions (NAMAs), Low Emission Development (LED), Intended Nationally Determined Contributions (INDCs), and other mitigation tools make it difficult for a holistic planning perspective in climate change mitigation.

- Data quality, completeness, and accuracy are of a primary concern when it comes to establishing the baseline and mitigation analysis. Data are not up to date, nor are they readily available in one place.

A1.3 Capacity building needs to fulfil commitments under the Paris Agreement (PA)

The Paris Agreement's Enhanced Transparency Framework (ETF) places new and more strict requirements on developing countries. To implement these new requirements capacity-building support is vital. Article 11 of the PA emphasizes the importance of building the capacity of developing country Parties. The objective is to allow them to take effective climate change actions, particularly via the implementation of adaptation and mitigation actions, so as to facilitate *“technology development, dissemination and deployment, access to climate finance, relevant aspects of education, training and public awareness and the transparent, timely and accurate communication of information”*.

Capacity for transparency can be strengthened through enhanced governance and institutional structures and supported by the right participatory approach. Jordan must organize institutional and governance structures able to collect, report, and use data for decision-making. Governments' ability to engage effectively with key stakeholders is critical to obtaining data of quality and in turn providing the right signals and guidance to convince stakeholders to support government's efforts.

Lasting systems and knowledge are critical to building capacity. More effort is required to build the critical knowledge within key national institutions, by looking at the educational channels and exploring further pedagogical approaches, including twinning programs, to produce active national and regional peer and professional communities. National capacity-building centres—national universities and training centres—need to play a central role in the building of more durable processes for collecting and managing better data, while creating sustainable skills and jobs.

Jordan has already started the capacity building process by taking part in the BUR ICA (as mentioned previously).

As for the implementation of Article 6 (A6) under the PA, Jordan has recently started the work of preparing a roadmap to promote and facilitate Jordan's engagement in A6. A working committee has been formed, aiming at raising awareness and building the capacity of the national stakeholders.

Article 6 has three operative paragraphs, two of which relate to carbon markets: (1) Article 6.2 provides an accounting framework for international cooperation, such as linking the emissions-trading schemes of two or more countries. It also allows for the international transfer of carbon credits between countries, (2) Article 6.4 establishes a central UN mechanism to trade credits from emissions reductions generated through specific projects, (3) Article 6.8 establishes a work program for non-market approaches, such as applying taxes to discourage emissions.

While A6 established these concepts in broad strokes and countries achieved some progress on defining the rules over the years, their final shape remains yet to be agreed.

A1.4 Technology Needs Assessment and Technology Transfer

Recently, in April 2020, the Green Growth Action Plan (GGAP) was published by MoEnv, identifying clearly the relation between the green growth and the climate change.

The GGAP focused on many interventions related to technology and knowledge transfer in the six sectors; the below are selected needed technologies that were identified:

Energy

- Improve energy demand management through development of a smart electricity grid

- Implement electric vehicle charging stations and services provision in Greater Amman Municipality through a public-private partnership
- Develop and implement a national energy storage action plan and investment pipeline
- Increase public investment in energy sector research and development
- Improve the enabling environment and capacity development support for the growth of the Energy Services Companies (ESCOs) market.

Transport

- Support the deployment of Intelligent Transportation Systems (ITS) to allow a modal and fair integration of the public and private transport systems in the city of Amman
- Establish a national centre of excellence and capacity building program for sustainable transport
- Develop a national electric mobility strategy and action plan
- Design and implement a public transport electric mobility pilot and capacity building program in Amman.

Waste

- Establish a national centre for excellence on waste management and circular economy to promote innovation, training, R&D, investment, and policy work
- Conduct market assessment and feasibility study to identify potential projects and programs to divert organic waste from municipal solid waste streams

Water

- Technical Assistance to support water efficiency in businesses, industries, and commercial activities (Based on SwitchMed¹²⁸ Experience)
- Expand the Samra Wastewater Treatment Plant (Phase III)
- Undertake Desalination of Seawater at the Gulf of Aqaba through Renewable Energy Sources

Agriculture

- Map and optimize research to impact pathways to improve relevance of innovation efforts in the agriculture sector
- Develop a flexible crop planning and variety selection methodology and decision-making process based on crop-per-drop and economic competitiveness
- Design and implement program to support demonstration resource efficiency projects in the olive cultivation and oil production sector
- Develop and implement pipeline of projects (all sizes) and policy recommendations to increase use of aquaponics and hydroponics in urban and rural areas
- Upgrade packaging, scaling, storage and cooling of fruits and vegetables managed by the private sector
- Promote the development of organic agriculture through knowledge exchange and market development.

Tourism

- Develop a roadmap for increasing resource efficiency in the tourism sector
- Establish a tourism sector centre of excellence to promote innovation and market development.

A1.5 Financial Resources Needs

According to NDCs, the Government of Jordan has proposed sectoral mitigation policies and programs to achieve a 14% reduction in GHG emissions by 2030 compared to the baseline scenario. The 14% reduction of GHG emissions is divided into two parts. The first part seeks to achieve a 1.5% reduction in GHG emissions through unilateral actions, while the remaining 12.5% reduction is contingent and conditional on receiving international financial support. In its NDCs, Jordan put the estimate of reducing

¹²⁸EU initiative aiming at enabling the switch to resource-efficient and circular economies in the Southern Mediterranean region

GHG emissions by 14% at USD 5.7 billion. To finance mitigation measures in the energy sector, Jordan will require USD 5,158 million to meet its conditional mitigation targets.

While a significant proportion of this is likely to come from international sources of finance, one of the key sectoral actions for the energy sector is attracting private sector finance and reducing administrative obstacles in order to enable JREEEF to support investments at early stages.

In Jordan, the role of the private sector is crucial and essential in achieving our NDC, the very high ratio of (Debt: GDP) makes it difficult for the Government to obtain loans. Therefore, the government is considering the role that the mobilization of private investment can play a role in implementing and achieving our NDC. Financial institutions and banks are interested in entering this new sector. Several green loans and programs are being established and green suppliers and manufacturers are growing in number. However, the market lacks proactive marketing and public outreach.

Previously an amount of 112 million JD were made available for RE and EE financing in Jordan; 76 million JD of the total were made available through the four commercial banks using the Central Bank of Jordan's window for RE and EE, and 36 million JD was made available through the Agence Française de Développement (AFD) facility. This experience was not successful, key challenges in disbursing these funds included the lack of credible market references and short credit history. Another challenge for banks was the lack of sufficient knowledge to verify project assumptions, technologies, or risks. They need access to an independent, credible reference body for the accreditation of RE and EE projects.

The work of public financing institutions, such as JREEEF and Jordan Environment Fund (JEF), although small scale, could play a crucial role in promoting early stage investments, particularly for public private partnership (PPP) projects, and for projects with co-financing. For JEF to fund mitigation activities will require a widening of its current role to include a specific focus on mitigation activity, and the development of project selection criteria including an assessment of projects' impact on GHG emissions. In addition, JEF currently lacks adequate human, technical, and financial capability to perform its current role, it needs strengthening at various levels to have an expanded role. JREEEF now is active and has full and adequate institutional, technical, and financial capacity to manage the fund, supported by a management committee, supportive legislation (JREEEF By-Law), a transparent and effective governance structure, a strategic business plan, and financial support windows.

The majority of financial resources pumped into environmental sectors in Jordan come from donor countries through bilateral agreements that focus on fiscal and developmental challenges in the country. Framework agreements and strategies with major donors like UNDP, United States Agency for International Development (USAID), UNEP, EU, GIZ, UNIDO, and other agencies have been developed and they address a variety of sustainable development objectives. The donor community is supportive of a public registry of projects which would allow transparency and coordination of ongoing activities, as well as the assessment of their cost effectiveness.

Annex 1 – Information for Jordan’s National Circumstances

1 Introduction

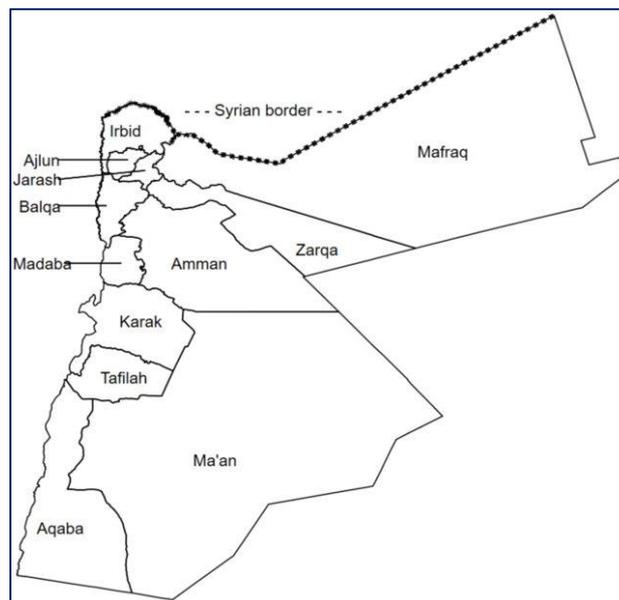
In developing Jordan's long-term low-carbon and climate-resilient strategy (LTS), it will be important to consider the country context. The geographical, political, social, economic, and regional context of Jordan will heavily inform the plans set forth in the LTS as well as the challenges it should consider and address – these aspects of national context are detailed in the following sections.

2 Geographical context

The Hashemite Kingdom of Jordan is a constitutional monarchy with a representative government. The reigning monarch is the head of state, the chief executive, and the commander-in-chief of the armed forces. The king exercises his executive authority through the Prime Minister and the Council of around 25 Ministers, or the "Cabinet". The Cabinet, meanwhile, is responsible before the elected House of Deputies which, together with the Senate, constitute the legislative branch of the government. The judicial branch is an independent branch of the government.

Jordan is divided into twelve administrative areas or Governorates (Amman, Irbid, Zarqa, Balqa, Karak, Mafraq, Ma'an, Tafila, Jerash, Madaba, Ajloun, Aqaba; see Figure 2) Each Governorate is managed by a Governor who is designated by the Cabinet based on the recommendation of the Minister of Interior. The Governorates are subdivided into districts, sub-districts, and chief towns, and these are managed by civil servants of the Ministry of Interior, whose task is to coordinate and supervise the decentralized services of other ministries under the authority of the Governor.

Figure 2: Jordan Governorates



Source: Krafft et al. (2019)¹²⁹

Jordan is a relatively small country situated at the heart of the Middle East, occupying an area of approximately 89,318 square kilometres. Approximately 75% of that space is taken up by desert. Despite the relatively small area, Jordan has diverse terrain and landscape demonstrating a variety usually found only in large countries. Jordan's climate is characterized by long, hot, and dry summers and short, cool winters. The climate is influenced by the country's location between the arid Arabian Desert and the humid eastern Mediterranean area. January is the coldest month,

¹²⁹ Krafft, C.G., Razzaz, S., Keo, C. and Assaad, R. (2019) The number and characteristics of Syrians in Jordan: A multi-source analysis. https://www.researchgate.net/publication/331411786_THE_NUMBER_AND_CHARACTERISTICS_OF_SYRIANS_IN_JORDAN_A_MULTI-SOURCE_ANALYSIS

with temperatures ranging from 5°C to 10°C, while August is the hottest month with temperatures ranging from 20°C to 35°C. Rainfall varies from season to season and from year to year. About 75% of the country can be described as having a desert climate with less than 200 millimetres of rain annually. About 70% of the average rainfall in the country falls between November and March, while in June through August are often rainless. However, during the last ten years Jordan has witnessed changing seasons and average temperatures.

Jordan can be divided into three main geographic and climatic areas: the Jordan Valley, the Mountain Heights Plateau, and the eastern desert, or Badia region. The Jordan Valley is the country's most distinctive natural terrain. The northern segment of the Jordan Valley, known in Arabic as the Ghor, is the most fertile region. Several degrees warmer than the rest of the country, its year-round agricultural climate, fertile soils, higher winter rainfall, and extensive summer irrigation have made the Ghor the food basket of Jordan. The Jordan Valley has the Jordan River which extends from the northern border down to the Dead Sea. The Mountain Heights Plateau is the highlands of Jordan, spanning the entire length of the western part of the country and separating the Jordan Valley from the plains of the eastern desert. These areas receive Jordan's highest rainfall and are the most richly vegetated in the country. This region hosts most of Jordan's population centres, including the cities of Amman, Madaba, Zarqa, Irbid, and Karak.

The Eastern Desert or Badia Region comprises around 75% of Jordan. This area of desert and desert steppe is part of what is known as the North Arab Desert. It stretches into Syria, Iraq, and Saudi Arabia, with elevations varying between 600 and 900 meters above sea level. Climate in the Badia varies widely between day and night, and between summer and winter. Daytime summer temperatures can exceed 40°C, while winter nights can be very cold, dry, and windy. Rainfall is minimal throughout the year, averaging less than 50 mm annually. Although the regions of the Badia (or desert) have common harsh desert climate, similar vegetation, and sparse population concentrations, they vary considerably according to their geology.

Jordan's water and agriculture resources are exposed to increased climate variability and a growing human pressure. Future climate change will likely exacerbate this vulnerability, with significant impacts on hydrological and agricultural ecosystems as well as "hotspot" socio-economic sectors (namely water, agriculture, and health). The most significant impacts are expected to affect poor rural populations, who are most vulnerable to climate change (TNC, 2014).

3 Population and society

Jordan is classified as a country of high human development and an upper-middle income country, with a population of 10.554 million inhabitants according to the Jordan Statistical Yearbook (DOS 2019). The population of Jordan has doubled more than 10 times over the past 55 years due to forced migration. According to a report released by the Department of Statistics (DOS)¹³⁰ in 2019, the population of Jordan has increased from about 586,000 in 1952 to 10.309 million by the end of 2018 (DOS, 2019). 755,050 people are registered as refugees in Jordan, among them approximately 664,226 Syrians (UNHCR, 2019). A young population with 33.6 percent under the age of 15, about 62.5 percent of the population is between the age of 15 and 64, and 3.9 percent is above 65 years old (UN, 2019).

The percentage of people living in urban areas in Jordan is 90.3%, with 74.8% of the Jordanian population living in the three largest cities (Amman, Zarqa, and Irbid) Figure 3. The rising rural-to-urban migration has contributed to increased pressures on housing, basic amenities, and demand for food (leading to inflation), and to rising inequality in living standards, both within the country, and within urban centres themselves (DOS, 2018).

The average annual household income was about 11242 JD in 2017 (DOS, 2017-2018). According to the latest household income and expenditure survey (DOS, 2017-2018), the average annual income

¹³⁰ Department of Statistics (DOS): <http://dosweb.dos.gov.jo/publications/>

from employment of a female-headed household was about 9534 JD, while for a male-headed household it was 11519 JD, which shows a gender pay gap of 17%. Gender inequality is also evident in workforce participation rates, with the World Economic Forum's 2020 Global Gender Gap Report¹³¹ finding that Jordan ranks 138th out of 153 countries for gender equality, with only 15.1% of women actively participating in the workforce compared to 67.4% of men.

The country has had to deal with the impacts of Syria's civil war, which has resulted in a significant influx of refugees. Approximately 80% of the Syrian refugees in Jordan live in urban areas in the north of Jordan, while the remaining 20% live in the Za'atari, Mrajeeb al-Fahood, Cyber City, and Al-Azraq camps. This has placed a huge burden on the country's infrastructure, public services, and natural resources. The additional pressures on energy contributed to high growth rate in energy and electricity demand. A high number of Syrian refugee children have been enrolled in Jordan's already crowded public schools. Housing costs in the north have risen by a staggering 300%, according to government data. The annual cost of providing for the refugees is roughly USD 2.9 billion (8% of Jordan's GDP), according to government data¹³², of which only 5.5% has been covered by the international community. The arrival of more than 200,000 Syrian workers (around 10% of Jordan's workforce), who are willing to work at below market wages, has placed downward pressure on local wages.

Jordanians are relatively well educated – the illiteracy rate is 5.1% for those above the age of 15 (7.2% for females and 3.1% for males; DOS, 2017). Also, public health status in Jordan is amongst the best in the Middle East, with overall average life expectancy reaching 73.5 years (DOS, 2017) and the infant mortality rate per 1000 population declining from 23 in 2009 to 14 in 2019 (UN, 2019)

4 Economy

The Jordanian economy is one of the smallest economies in the region. A lack of natural resources, a high population growth rate, the ongoing regional conflicts, the rising cost of health care, and the growing expectations of people have posed challenges to the country's sustainable social and economic development.

Basic economic indicators of 2018 (Jordan Statistical Yearbook, DOS 2019¹³³):

- Gross Domestic Product at current prices is 30482 Million JD
- Gross Domestic Product at constant prices is 29,474 Million JD
- Annual Growth Rates of Gross Domestic Product at Current Prices is 3.7%
- Annual Growth Rates of Gross Domestic Product at constant Prices is 1.9%
- Compensation Annual Growth Rates of employees as a percentage of GDP for 2018 is 39.0%
- Government final consumption expenditure as a percentage of GDP at current prices for 2018 is 17.1 %
- Gross Fixed Capital formation out of GDP at current prices for 2018% is 20.4%
- Export of goods and services out of GDP at current prices for 2018 is 35.1%
- Imports of goods and services out of GDP at current prices for 2018 is 53.0 %

The national accounts statistics published by the Department of Statistics (DOS) showed that there was an improvement in GDP per capita at existing prices in 2018 while the GDP growth rate decreased, as shown in Table 3.

¹³¹ World Economic Forum (2019), "Global Gender Gap Report 2020":

http://www3.weforum.org/docs/WEF_GGGR_2020.pdf

¹³² Ministry of Environment (2017), "Jordan's First Biennial Update Report to the UNFCCC":

<https://unfccc.int/sites/default/files/resource/Jordan%20BUR1.pdf>

¹³³ Available at http://dosweb.dos.gov.jo/products/statistical-year_book2019/

Table 3: Indicators of national accounts, 2014-2018. Source: Jordan Statistical Yearbook 2019 (DOS)

Indicators	2014	2015	2016	2017	2018
GDP at Current Prices (million JD)	25,437.1	26,637.4	27,444.8	28,448.5	30,482
GDP at Constant Prices (million JD) (1994=100)	11,147.6	11,413.2	11,642.9	11,872.3	29,474
GDP Growth Rate at Constant Prices (%)	3.1	2.4	2.0	2.0	1.9

Jordan's top contributing sectors to GDP are government services, finance, manufacturing, transport, as well as tourism and hospitality.

Table 4: The percentage contribution to GDP by economic activity at current prices during the period, 2014 to 2018. Source: Jordan Statistical Yearbooks 2014-2019 (DOS)

Economic Activity	2014	2015	2016	2017	2018
Manufacturing	16.7	16.5	16.4	16.2	17.9
Wholesale and Retail Trade, Restaurants, and Hotels	10.1	9.9	9.9	9.8	9.4
Transport, Storage, and Communications	14.4	14.5	14.7	14.8	16.5
Finance, Insurance, and Business Services	9.7	9.9	8.0	8.1	8.4

The government identified poverty and unemployment as two of the most important challenges facing the country. Jordan is one of the Arab countries with the lowest employment rates for both men and women, among those above the age of 15 unemployment was at 23.9% in Q3/2020. The World Economic Forum's 2020 Global Gender Gap Report¹³⁴ found that only 15.1% of women actively participating in the workforce compared to 67.4% of men.

All categories of the 2017 budget, including domestic revenues, foreign grants, current expenditure, and capital expenditure, showed a decline compared with the year before. The sharp drop in foreign grants from 700 million JD in 2018 compared to 1236.5 million JD in 2014, came as a shock, as Jordan depends heavily on foreign grants to finance its capital expenditure. The consolidated budget deficit for the central government and government Own Budget Units in 2017 reached 694.8 million JD compared to 825.9 million JD within the same period of 2016. Outstanding external public debt (government and government guaranteed) decreased by 2.6% to reach 11560 million JD at the end of the second quarter of the year 2018, which represents decrease in the percentage to GDP from 41.7% at the end of 2017 to 39.8% by the end of the second quarter of 2018. (MOF, 2018). In contrast, net domestic debt balance increased by 10.6% reaching JD 15005 million at the same period, net domestic debt as percent of GDP was 51.6 % by the end of the second quarter of 2018 compared to 47.7% of GDP at the end of 2017. The net public debt outstanding increased by 4.4% from its level at the end of 2017, reaching about JD 26564 million, and representing 91.4% of 2018 estimated Gross Domestic Product (GDP).

5 Regional context and related challenges

Jordan's recent history and associated policy responses has been shaped by a series of crises within the region, from energy to refugees and now a pandemic. The responses to these crises have by necessity been reactive – identifying ways to manage and respond to these external pressures. Jordan

¹³⁴ World Economic Forum (2019), "Global Gender Gap Report 2020": http://www3.weforum.org/docs/WEF_GGGR_2020.pdf

continues to face a number of challenges, driven by demographics, geography, and politics, which provide important context for the LTS.

5.1 Socio-economic challenges

Jordan faces several challenges due to the country's demographics, in particular a significant proportion of refugee population relative to its size: Jordan has around 4 million refugees from various origins. Approximately 80% of the Syrian refugees in Jordan live in urban areas in the north of Jordan, while the remaining 20% live in the Za'atari, Mrajeeb al-Fahood, Cyber City, and Al-Azraq camps. This has placed a huge burden on the country's infrastructure, public services, and natural resources. The annual cost of providing for the refugees is roughly USD 2.9 billion (8% of Jordan's GDP), according to government data, of which only 5.5% has been covered by the international community¹³⁵. The arrival of more than 200,000 Syrian workers (around 10% of Jordan's workforce), when combined with the estimated number of foreign workers in Jordan, who are mostly from the region, puts estimates of non-citizens in Jordan at over 5 million—potentially around half of Jordan's total estimated population. It has been suggested that this refugee influx could cause downward pressure on wages¹³⁶. However, it is important to note that some studies suggest no negative impacts of refugees on labour market outcomes for locals, including wages¹³⁷.

The Jordanian economy is one of the smallest economies in the region. The structure of Jordan's economy makes it highly vulnerable to external shocks, as the country is deeply linked to the global economy, importing around 90 percent of its food items and energy requirements and highly dependent on regional exchanges for water. The service sector contributes over 70% of the Gross Domestic Product (GDP) and 75% of jobs, but creates little activity of added value, while the country's industrial base remains narrow¹³⁸. A lack of natural resources, a high population growth rate, the ongoing regional conflicts, the rising cost of health care, and the growing expectations of people have posed challenges to the country's sustainable social and economic development.

The Syria crisis is having an extended adverse effect on Jordan's economy. The crisis has gravely hit Jordan's fiscal situation. It has put pressure on the delivery of basic services to the people, Jordanian citizens and refugees alike, in a country already suffering from scarcity of natural resources and from pre-existing vulnerabilities in its delivery systems. It has impacted its infrastructure, and has rendered critical the need for a large and ambitious agenda to help the country face the threat of economic and social destabilization. Jordan's response is a developmental one, with a focus on investing in and upgrading the country's structures thus strengthening the country's resilience.

There has been little regional policy-making and cooperation on climate change with neighbouring States. Regionally, it has sought to cooperate with Israel and Syria on water, but both countries have violated agreements and overused water to the detriment of Jordan.

5.2 Energy challenges

With energy, Jordan is attempting to diversify its providers of fossil fuels while increasing its domestic production of renewable energies (particularly wind and solar). Acceleration of economic development and rising standards of living have made energy security a top priority. The issue of securing energy is particularly challenging for Jordan, which suffers from scarcity of natural resources, combined with the regional instability and conflicts. Jordan's energy security has been historically linked to its relations with neighbouring countries and is thus vulnerable to external shocks and outside political events. Despite the reform efforts to reduce dependency from imports and some progress in diversifying the energy mix, energy security remains critical: the country imports more than 93% of its energy, which

¹³⁵ Jordan's First Biennial Update Report to the United Nations Framework Convention on Climate Change, 2017, https://unfccc.int/files/national_reports/non-annex_i_parties/biennial_update_reports/application/pdf/jordan_bur1.pdf

¹³⁶ Correspondence with local partners

¹³⁷ Fallah, B., Krafft, C. and Wahba, J. (2019), 'The impact of refugees on employment and wages in Jordan', *Journal of Development Economics*, vol.139, pp. 203-216. Accessed from: <https://www.sciencedirect.com/science/article/abs/pii/S0304387818310344>

¹³⁸ ACT Alliance (2018), Enhanced Climate Action in Response to 1.5°C of Global Warming. Scaling Up Nationally Determined Contributions, https://www.preventionweb.net/files/62199_actalliancereport1.5c.pdf

represents approximately 8% of GDP. The growing domestic demand, which increases at a yearly rate of 3%, the fact that further adds to the pressure to envision strategies towards a more sustainable energy sector. These strategies will need to include investment in renewable energy, the reduction of energy consumption via increasing energy efficiency, and also synergic agreements with other countries.

Historically, the repeated sabotage of the Arab Gas Pipeline which supplies Egyptian natural gas to Jordan since 2011, and resulting disruption in gas supplies, has significant macroeconomic implications. Prior to this, Jordan was relying on the Egyptian gas for electricity generation, with 80% of gas imported from Egypt. When the interruptions happened, the government had to switch to heavy fuel oil and diesel for electricity generation, at a cost four times that of natural gas (this cost the country 3.5 million JD a day, and 555 million JD was paid as a subsidy for oil products in 2011). Despite the favorable conditions for solar and wind, Jordan's energy mix is still dominated by imported fossil fuels and natural gas. As such, the country's energy security is vulnerable to international and regional developments, as well as to fluctuations in energy prices. Redefining strategies towards a more sustainable energy sector is at the top of the political agenda in Jordan and the authorities have been envisioning alternative options, but progress has been moderate so far.

The generation capacity of thermal power plants as of the end of September 2019 reached (4,257 MW) and while the generation capacity of renewable energy projects (solar and wind) reached (1,130 MW). Comparatively the maximum peak load for the first half of 2019 was around 3,000 MW. This volume of available generating capacity is large compared to the maximum peak load and even, considering the capacity of conventional generation stations only, exceeds it by 30%. This is in contrast to the internationally recognized practices in this industry, which has limits of 10% -15%, especially in electrical systems that are connected to electric networks similar to the Jordanian network. Again, this causes significant costs for the electrical system since there is a commitment to pay for the cost of capacity for the power stations, even if their operation is suspended, according to the Energy Purchase Agreement which is based on the principle of 'take or pay'. Continuous operation of the power stations is not needed as a result of declining growth rates in electricity demand. A high growth rate for the peak load of 6.2% annually was adopted in the electrical system expansion planning, however, the actual growth rate during the three years of (2017-2019) ranged between (0% - 2%). This was a result of consumers' tendency to increase the use of energy-saving technologies, and to expand dependence on self-generation through small and large renewable energy projects, as well as economic growth decline as a result of political conditions in the region. Jordan's energy strategy should be updated and revised every three to five years¹³⁹. Strategy updates are especially useful in under-developed countries such as Jordan, because the impacts of internal and external influences are much greater than in developed countries. Issues of short-sighted politics, dependency, and impediments to research & technology transfer all contribute to energy planning instability. However, the impact of these factors on the energy strategy would be much less dramatic if Jordan would step towards energy independence. This could be done through long term planning, through accessing local oil shale and gas & renewable energies, as opposed to importing Egyptian & Israeli gas and heavy crude oil from Saudi Arabia and Iraq.

5.3 Water challenges

Jordan is ranked as the second poorest country in the world in water sources, with less than 100 m³/capita/year of renewable water resources. For most of its surface waters, Jordan is dependent on the transboundary Yarmouk and Jordan Rivers, whose waters both Syria and Israel have overused to the detriment of Jordan. Syria has carried out unilateral water projects in the Upper Yarmouk basin, and Israel has carried out projects in the Upper Jordan River and the Golan. Their actions have violated long-standing agreements, and left Jordan with under 10% of the total flow of the freshwater resources of the Upper Yarmouk and Jordan Rivers. This could cause further destabilisation and conflict in the

¹³⁹ <https://library.fes.de/pdf-files/bueros/amman/11188.pdf>

region. Additionally, the effects of climate change and climate vulnerability will complicate the management of shared resources of water¹⁴⁰.

Despite Jordan's severe water scarcity, more than 94% of Jordanians have access to safe drinking water and 65% have access to improved sanitation. These are some of the highest rates in the Middle East and North Africa region. However, water supply is intermittent, and the rooftop tanks have become an integral part of the supply water storage system. Around 50% of Jordanians are supplied by water once a week (24 hours) while the rest are supplied by a higher rate (more than 24 hours per week) (MWI, 2017). Since the Disi-Amman Conveyor project became operational in the summer of 2013, the continuity of water supply to Amman has improved. However, population centers in the northern Governorates have not benefitted fully because of increased demand driven by the concentration of Syrian refugees in the north. Aqaba has continuous water supply from the Disi aquifer. It is planned to bridge the remaining gap between demand and supply through increased use of non-conventional water including reclaimed water and desalinated seawater to be provided by the Red Sea-Dead Sea project in the near future. The National Water Strategy emphasizes desalination as well as treated wastewater reuse to meet shortfalls in freshwater availability (MWI, 2017).

Jordan also faces challenges surrounding the fiscal sustainability of the water sector, and these challenges are likely to be compounded by the COVID-19 pandemic. The recently completed public expenditure review¹⁴¹ suggests that, before the COVID pandemic, the water sector deficit was JD 310 million (1 percent of GDP) and the accumulated sector debt JD 2,334 million. The total debt from both loans and PPPs is JD 4,086 million (13 percent of GDP). The 2019 national budget estimated that the cost of subsidizing the water agency running costs and charges to the PPPs at JD 229 million and the cost of repaying debt falling due at JD 297 million. Coping with the additional costs associated with COVID, reducing the unsustainable withdrawals of water and substituting them with desalinated water will put considerable additional financial burden on the water sector, with the annual deficit expected to rise to JD 655 million (2 percent of GDP) by 2026. Exploring ways to enhance efficiency in water provision will be key for financial sustainability and building climate resilience.

5.4 Gender equality

Women's economic participation in Jordan is one of the lowest globally; Jordan was ranked 131 out of 156 on the 2021 gender gap index, and 133 out of 156 on economic participation and opportunities. In the MENA region, women generate only 18% of GDP, suggesting greater inclusion is a major economic growth opportunity¹⁴². The government of Jordan has set an ambitious target of increasing the female labour force participation to 24% over the next five years and has developed a Women's Economic Empowerment Action Plan¹⁴³, closely linked to the development of the National Women Strategy (2020-2025), to identify the broad focus of required actions. However, the unemployment rate in Jordan has reached (23.9%) during the third quarter of 2020; 33.6% for females compared to 21.2% for males. The male unemployed percentage of bachelor-degree holders and higher was 25.2% compared to 77.0% for females, showing there is a very large talent pool of educated females looking for jobs.

From a climate perspective, studies have found that in some cases adaptation actions have led to increased workload and reduced decision-making power for women¹⁴⁴. On the other hand, climate change adaptation and clean energy present an opportunity for increasing women's participation in the labour market, with clean energy and climate change adaptation interventions potentially providing a significant opportunity for employment of females particularly when investing in the governorates as an

¹⁴⁰ Combaz, E. (2019). Jordan's environmental policies and engagement on climate change. K4D Helpdesk Report. Brighton, UK: Institute of Development Studies.
https://assets.publishing.service.gov.uk/media/5d30a131ed915d2ff003b781/619_Jordan_Environment_Policies_and_Engagement.pdf

¹⁴¹ Information on the recent public expenditure review was provided by local partners

¹⁴² Jordan Energy Strategy

¹⁴³ World Bank Group (2019) 'Women's Economic Empowerment Action Plan'

<http://pubdocs.worldbank.org/en/379131574445136942/pdf/Jordan-WEEAP-Jan-19-2019-en.pdf>

¹⁴⁴ Sovacool, B.K. & Linner, B.O. (2016). The political economy of climate change adaptation. New York: Palgrave Macmillan.

analysis revealed that women choice of employment is highly influenced by having a job in the same area of residency¹⁴⁵. Enhancing women's economic participation through investing in clean energy job creation and preparedness of women and girls to enter these work fields, will help support the national vision of increasing women's economic participation to 24%. Gender mainstreaming has become an increasingly important consideration in Jordan's planning processes, and the LTS therefore presents an opportunity to address gender inequalities. By acknowledging gender differences in the process, efforts can be made to empower women as agents of change and overcome traditional barriers to women's participation in decision making¹⁴⁶.

5.5 COVID-19 challenges

Jordan has been struggling to minimize the health impact of the COVID-19 crisis. Soon after the outbreak, the Government of Jordan announced a first set of measures and incentives to address immediate liquidity and cost of financing concerns for various sectors/businesses, and measures to protect vulnerable households. Nevertheless, domestic lockdowns, the global economic slowdown, trade disruptions, and the suspension of international travel had a sizable impact on the Jordanian economy. The unprecedented economic shock of COVID-19 has exacerbated existing structural weaknesses in the economy and unresolved social challenges and put pressure on country's fragile macroeconomic stance. Key challenges to Jordan's outlook include the prolonged decline in economic activity from domestic lockdowns, which could escalate high unemployment levels. The speed of economic recovery in the medium-term largely depends on the evolution of the pandemic and whether reforms are put into effect.

Jordan's early response and implementation of several laws and containment policies can be justified given the many challenges facing the country even before the epidemic. Yet the current measures must be understood as merely short-term mitigation measures. The country will soon need to rethink its longer-term situation in the wake of the pandemic. For a country with such social, economic, and environmental stresses, the coronavirus could serve as a wake-up call, triggering the switch from its existing crisis adjustment policy to a robust crisis management and alleviation policy. Such changes can only be implemented through political will—and the risks either way are unavoidably substantial. The COVID-19 crisis and recovery has the potential to be an opportunity for planners and policy makers to take transformative actions towards creating a country that is more just, resilient, and sustainable.

¹⁴⁵ JEDCO, Women entrepreneurship in Jordan (2018), <https://www.gemconsortium.org/report/women-entrepreneurship-in-jordan-2016-2017-women-empowerment>

¹⁴⁶ World bank, 2011, Gender and climate change, three things you should know, Washington DC

Annex 2 – Report on Jordan’s Long-Term Vision

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6 Introduction

UNFCCC Decision 1/CP.21 invites countries to communicate, by 2020, a “mid-century, long-term low GHG emission development strategies, taking into account their common but differentiated responsibilities and respective capabilities, in the light of different national circumstances”. This is enshrined in Art 4.19 which stipulates that all Parties should strive to formulate and communicate long-term low GHG emission development strategies.

These “mid-century long-term low GHG emissions development strategies”, also known as a long-term strategy (LTS), are central to achieving the goal of limiting warming and preventing some of the worst impacts of climate change. LTSs therefore play a key role in the transition toward climate resilient and low emission economies.

In its First Nationally Determined Contribution (NDC) the Hashemite Kingdom of Jordan has proposed to reduce its GHG emissions by a total of 14% by 2030. Alongside this, the Government of Jordan has committed to specific actions on climate change and has proactively introduced NDC priorities into sectoral policies for energy, water, transport, and urban sectors. These actions will support the delivery of the 2030 target. However, there is a need to also consider what actions may be required **over a longer timescale**, as part of Jordan’s transition towards a climate resilient low emissions economy.

In response to this need, the objective of the assignment is **to prepare a detailed roadmap, recommendations and best practices, for the formulation of a Long-Term Low-carbon and Climate Resilient Strategy (LTS) or 2050 pathway, for Jordan, including plans for mainstreaming into sector and development strategies across all sectors.**

The first and arguably most important component of a LTS is the long-term vision.

As an interim deliverable under the project, this report (deliverable 2) provides an assessment of Jordan’s long-term visions to date, and recommendations for developing the Jordanian LTS vision.

The report includes a review of the goals, objectives and visions within existing national long-term strategies, policies, legal frameworks, and plans in Jordan. It also includes an assessment of any sectoral or sub-national goals, and well as wider development goals. Understanding these wider goals and objectives is important when developing the vision for the LTS, to ensure that they are aligned.

This report or elements of, will subsequently be integrated into the final Roadmap for Jordan’s LTS, forming the basis of the chapter on Jordan’s long-term vision.

The Annexes to this report include summary descriptions of key strategies and policies, as well as background to Jordan’s GHG emissions and climate commitments.

Objective: To assess existing long-term visions/goals in Jordan that are relevant for the development of the LTS

Outputs: A summary of existing long-term visions/goals in Jordan. A review of the visions and visioning processes used by other countries.

7 Country context

“By failing to prepare, we are preparing to fail”

Jordan’s recent history and associated policy responses has been shaped by a series of crises – from energy to refugees and now a pandemic. The responses to these crises have by necessity been reactive – identifying ways to manage and respond to these external pressures. Jordan continues to face a number of challenges, drive by demographics, geography, and politics, and these form important context for this work.

Jordan faces several challenges due to the country’s demographics, in particular a significant proportion of refugee population relative to its size: Jordan has around 4 million refugees from various origins. When combined with the estimated number of foreign workers in Jordan, who are mostly from the region, this estimated figure of non-citizens in Jordan is over 5 million—potentially around half of Jordan’s total estimated population. Also, the structure of Jordan’s economy makes it especially vulnerable, as the country is deeply linked to the global economy, importing around 90 percent of its food items and energy requirements.

In terms of energy, acceleration of economic development and rising standards of living have made energy security a top priority for policy makers worldwide. The issue of securing energy is particularly challenging for Jordan, which suffers from scarcity of natural resources, combined with the regional instability and conflicts.

Jordan’s energy security has been historically linked to its relations with neighbouring countries and is thus vulnerable to external shocks and outside political events. Despite the reform efforts to reduce dependency from imports and some progress in diversifying the energy mix, energy security remains critical: the country imports more than 93% of its energy, which represents approximately 8% of GDP. The growing domestic demand, which increases at a yearly rate of 3%, the fact that further adds to the pressure to envision strategies towards a more sustainable energy sector. These strategies will need to include investment in renewable energy, the reduction of energy consumption via increasing energy efficiency, and also synergic agreements with other countries.

Historically, the repeated sabotage of the Arab Gas Pipeline which supplies Egyptian natural gas to Jordan since 2011, and resulting disruption in gas supplies, has significant macroeconomic implications. Prior to this, Jordan was relying on the Egyptian gas for electricity generation, with 80% of gas imported from Egypt. When the interruptions happened, the government had to switch to heavy fuel oil and diesel for electricity generation, at a cost four times that of natural gas (this cost the country 3.5 million JD a day, and 555 million JD was paid as a subsidy for oil products in 2011).

Despite the favorable conditions for solar and wind, Jordan’s energy mix is still dominated by imported fossil fuels and natural gas. As such, the country’s energy security is vulnerable to international and regional developments, as well as to fluctuations in energy prices. Redefining strategies towards a more sustainable energy sector is at the top of the political agenda in Jordan and the authorities have been envisioning alternative options, but progress has been moderate so far.

The generation capacity of thermal power plants as of the end of September 2019 reached (4,257 MW) and while the generation capacity of renewable energy projects (solar and wind) reached (1,130 MW). Comparatively the maximum peak load for the first half of 2019 was around 3,000 MW. This volume of available generating capacity is large compared to the maximum peak load and even, considering the capacity of conventional generation stations only, exceeds it by 30%. This is in contrast to the internationally recognized practices in this industry, which has limits of 10% -15%, especially in electrical systems that are connected to electric networks similar to the Jordanian network. Again, this causes significant costs for the electrical system since there is a commitment to pay for the cost of capacity for the power stations, even if their operation is suspended, according to the Energy Purchase Agreement which is based on the principle of ‘take or pay’. Continuous operation of the power stations is not needed as a result of declining growth rates in electricity demand. A high growth rate for the peak load of 6.2% annually was adopted in the electrical system expansion planning, however, the actual growth rate during the three years of (2017-2019) ranged between (0% - 2%). This was a result of consumers’

tendency to increase the use of energy-saving technologies, and to expand dependence on self-generation through small and large renewable energy projects, as well as economic growth decline as a result of political conditions in the region.

Jordan's energy strategy should be updated and revised every three to five years¹⁴⁷. Strategy updates are especially useful in under-developed countries such as Jordan, because the impacts of internal and external influences are much greater than in developed countries. Issues of short-sighted politics, dependency, and impediments to research & technology transfer all contribute to energy planning instability. However, the impact of these factors on the energy strategy would be much less dramatic if Jordan would step towards energy independence. This could be done through long term planning, through accessing local oil shale and gas & renewable energies, as opposed to importing Egyptian & Israeli gas and heavy crude oil from Saudi Arabia and Iraq.

In terms of COVID-19, Jordan's early response and implementation of several laws and containment policies can be justified given the many challenges facing the country even before the epidemic. Yet the current measures must be understood as merely short-term mitigation measures. The country will soon need to rethink its longer-term situation in the wake of the pandemic. For a country with such social, economic, and environmental stresses, the coronavirus could serve as a wake-up call, triggering the switch from its existing crisis adjustment policy to a robust crisis management and alleviation policy. Such changes can only be implemented through political will—and the risks either way are unavoidably substantial.

Generally, the COVID-19 crisis can be seen as an excellent opportunity for planners and policy makers to take transformative actions towards creating cities that are more just, resilient, and sustainable

Therefore, there is now a need to take a long-term view, and consider how taking a longer term view can help to transcend some of the challenges the country has and is facing. Responding to crises whilst also proactively shaping a future several decades away requires a careful balance between short term and long-term issues and priorities, identifying what these should be and ensuring trade-offs to achieve them are not minimised in the immediate term. This can enable short term responses to be undertaken within the framework of the 'long term objective'. Essentially, ensuring that recovery and bounce-back is still aligned with the long-term pathway. This helps to ensure decision-making and solutions in the short term can be taken with a long-term view, to avoid lock-in to unsustainable or incompatible technologies or policy decisions. The development of Jordan's Long-Term Strategy on climate change could be one opportunity through which to achieve this.

¹⁴⁷ <https://library.fes.de/pdf-files/bueros/amman/11188.pdf>

8 Overview of LTSs

Under the Paris Agreement, Parties are committed to limiting the increase in global average temperature to well below 2°C and to pursue efforts to limit this warming to 1.5°C. Long-term strategies (LTSs) provide an opportunity to bring national actions in line with the efforts necessary to achieve this global target.

8.1 International requirements

Article 4, paragraph 19 of the Paris Agreement invites countries to prepare and communicate an LTS. Unlike nationally determined contributions (NDCs), which are a requirement of the Paris Agreement, all Parties should “*strive to formulate and communicate mid-century, long-term low greenhouse gas emission development strategies*”.

Parties should also be “*mindful of Article 2 taking into account their common but differentiated responsibilities and respective capabilities, in the light of different national circumstances*” when preparing their LTS¹⁴⁸. Article 2(b) is concerned with ‘*Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production*’.

Terminology:

LTS → “*Long Term Strategy*”

Also referred to as

LT-LEDS → “*Long-Term Low Emission Development Strategy*”

8.2 Wider benefits of an LTS

Beyond meeting the goals of the Paris Agreement, development of an LTS can also serve a number of valuable domestic purposes. For example:

- The process of developing an LTS allows the government and its citizens to collectively decide what future they want for their country while meeting sustainable development priorities and safeguarding the climate.
- Focus only on short- and medium-term targets (such as 2020 or 2030) could keep countries from making the fundamental changes they need, and make decarbonization costlier and more difficult over the longer term.
- Long-term strategies are crucial to ensuring that countries’ near-term actions are consistent with their ultimate goals - puts short-term actions into context.
- Long-term strategies can help governments to recognise climate-related risks, both from direct impacts, and from the low-carbon transition itself, which could sharply devalue high-carbon assets.
- Long-term strategies can help countries to unlock new economic opportunities, innovate, and create the jobs of the future.

The benefits of long-term planning are particularly relevant for Jordan, where most national plans and strategies – as outlined in subsequent sections of this report – are overwhelmingly focussed on short and medium-term goals. Therefore, the development of Jordan’s LTS represents an opportunity to shift decision-making and strategic thinking to the longer-term perspective, creating a vision and associated narrative that future strategies, as well as future crisis response options, can be assessed against. This will help ensure that future decisions can be taken under the framework of this long-term goal, using the LTS as an additional lens for decision-making. This is illustrated in the figure below, where the vision for the LTS, and the associated pathways, can be used as a reference point to inform decision making, including crisis response.

¹⁴⁸ UNFCCC, Communication of Long-Term Strategies <https://unfccc.int/process/the-paris-agreement/long-term-strategies>

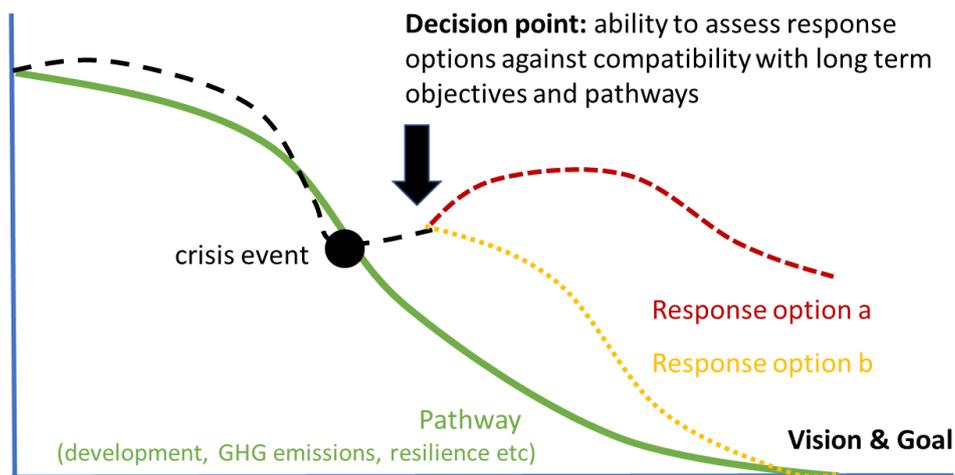


Figure 3: Illustration of the role of a long-term pathway, vision and goal in providing a guiding framework to guide shorter term decision making and responses

Source: Developed by Ricardo Energy and Environment

KEY FINDING

All these factors are important for a country such as Jordan, currently in the midst of the Covid-19 pandemic and undertaking updates of key national planning documents (such as the Executive Programme and Jordan 2025 mid-term review), as well as updating the country's NDC. There is currently much change and uncertainty with regards to the future, and a lack of existing long-term plans (beyond 2030). Undertaking a longer-term planning process in the country will help ensure that decisions made in the near term are consistent with long term objectives, ensure updates to strategies and policies are undertaken in a harmonised way, provide the opportunity for new voices to be heard and citizens to shape their country's recovery, and provide some longer term policy certainty and an international signal of decarbonisation intent. Furthermore, setting a long-term vision and creating a strategy to achieve this, charting a pathway and identifying key milestones, will help to ensure that future short-term crisis responses and recovery policies can be aligned to a longer-term pathway.

8.3 Common elements of an LTS

While UNFCCC Decision 1/CP.21 invites countries to communicate an LTS, it does not define in any detail what the LTS should contain. Fortunately, there are a number of common elements that feature in the LTSs that have been prepared by other countries, which can provide inspiration for what Jordan's LTS may include.

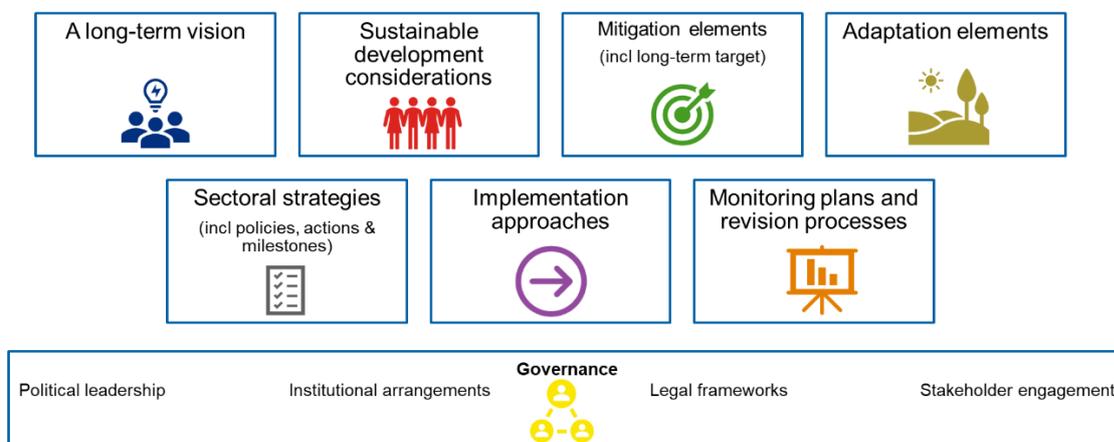


Figure 4: Common elements of an LTS

Source: Developed by Ricardo Energy and Environment

To date, 28 Parties have submitted an LTS to the UNFCCC¹⁴⁹ (last checked:14/01/2021). The structure and content of these LTSs exhibit significant variation. For example, while many countries choose to detail a singular set of actions or policies they intend to implement to reach their 2050 goal, others (e.g. Fiji¹⁵⁰ provide multiple future emissions scenarios and then detail the actions required to achieve each. Furthermore, some countries (e.g., Fiji⁶⁰, Costa Rica¹⁵¹) link their LTS vision to the visions set forth in other relevant policies/documents (e.g. NAPs and NDCs), using the LTS to build upon these policies and enhance their ambition. Others (e.g., Norway¹⁵², Japan¹⁵³) take a more “off the shelf” approach, where their LTS is largely documentation of existing policies, but framed under a new long-term vision. There is no “one-size-fits-all” format for an LTS, resulting in the varied approaches noted above. Nevertheless, there are key elements that the World Resources Institute¹⁵⁴ suggests all LTSs should seek to incorporate, shown in Table 5. Underpinning these 7 common elements is a strong governance framework, and as part of this, stakeholder engagement.

The table below expands on these seven common elements and uses country examples to describe the contents that might be included in an LTS.

Table 5: Common elements of an LTS

#	Key elements	Description and examples
1	A long-term vision	The purpose of including a long-term vision in an LTS is so that its development remains focussed and is guided by an overarching end goal that is simple, transparent and easy to communicate. A good example of this is included within Fiji’s LTS ⁶⁰ (F-LTS). It describes how the country aims to reach net zero carbon emissions by 2050 across all sectors of its economy, and how it is underpinned by similar visions contained within its national development frameworks.
2	Sustainable development considerations	Including sustainable development considerations within an LTS can serve to harmonise both near and longer-term sustainable development agendas with those of the Paris Agreement. Research has found that national level implementation of the 2030 Agenda for Sustainable Development and the Paris Agreement on climate change can be prone to divergence, despite the opportunities for synergies.

¹⁴⁹ UNFCCC (no year), “Submitted Long-term Strategies”: <https://unfccc.int/process/the-paris-agreement/long-term-strategies>

¹⁵⁰ Fiji’s Low Emission Development Strategy 2018-2050. Fiji Ministry of Economy with support from the Global Green Growth Institute (GGGI).
https://unfccc.int/sites/default/files/resource/Fiji_Low%20Emission%20Development%20%20Strategy%202018%20-%202050.pdf

¹⁵¹ Government of Costa Rica (2018), “National Decarbonisation Plan”:

<https://unfccc.int/sites/default/files/resource/NationalDecarbonizationPlan.pdf>

¹⁵² Government of Norway (2020), “Long-term Low-emission Development Strategy”:

https://unfccc.int/sites/default/files/resource/LTS1_Norway_Oct2020.pdf

¹⁵³ Government of Japan (2019), “The Long-term Strategy under the Paris Agreement”:

<https://unfccc.int/sites/default/files/resource/The%20Long-term%20Strategy%20under%20the%20Paris%20Agreement.pdf>

¹⁵⁴ World Resources Institute (no year), “What is an LTS?”: <https://www.wri.org/climate/what-long-term-strategy>

#	Key elements	Description and examples
3	Adaptation elements	Including adaptation is considered a key element in an LTS due to the importance of a long-term plan to build resilience to the effects of climate change across the country. The degree of focus between sectors such as agriculture, health and water will vary country by country, as will the strategy's description of its long-term efforts to reduce their vulnerability to climate change. To date, few countries have developed an LTS that includes substantial information on adaptation elements, however Benin's 2016-2025 strategy and Mexico's LTS (amongst others) provide examples of low to middle income countries that have. ^{155, 156}
4	Mitigation elements	Including mitigation elements is key to an LTS in order to demonstrate how the country plans to mitigate its contributions to climate change over the long-term. Typically, this includes a GHG emissions target for 2050, and a scenario that illustrates a potential pathway to achieve that target. Other scenarios may be included, for instance that vary in their conditionality or ambition.
5	Sectoral strategies	Detailing how the LTS will affect different sectors of the economy is central to providing a transparent level of detail. This can include policies and actions for each sector, the milestones to be achieved over time, or information on managing the transition to the long-term goals among others will. An example of this can be seen in Costa Rica's LTS ⁶¹ , where 10 sectoral decarbonisation "axes" are described ¹⁵⁷ .
6	Implementation approaches	Providing details on the approaches to implementing a country's LTS is a key element of the strategy and can include referencing how efforts to implement the LTS will be co-ordinated, details regarding a long-term finance strategy as well as any overseas aid or investment that would be required. This could relate to policies and actions described in the adaptation and mitigation chapters, as well as in-country capacity building or technical support. An example of this can be seen in the Marshall Islands LTS, that details its headline recommendations in a chapter on means of implementation ¹⁵⁸ .
7	Monitoring plans and revisions processes	A LTS typically extends to the mid-century and so the importance of including how this strategy and its sectoral actions will be monitored, revised and updated is important. This can include providing information on the Monitoring and Evaluation Framework of the strategy, any institutional arrangements that are to be put in place, as well as any information around national monitoring, reporting and verification (MRV) systems. Fiji's LTS ⁶⁰ provides an example of this in their chapter titled Governance, Monitoring and Evaluation.

Source: Ricardo Energy & Environment

8.4 Long-term vision

"Ambition hinges not just on setting a long-term aspirational goal but also on translating this goal into a society-wide vision"¹⁵⁹

¹⁵⁵ Stratégie de développement à faible intensité de carbone et résilient aux changements climatiques. Ministère du Cadre de vie et du Développement Durable, AFD, UNDP. https://unfccc.int/files/focus/long-term_strategies/application/pdf/benin_long-term_strategy.pdf

¹⁵⁶ Mexico's Climate Change Mid-Century Strategy. Mexico Ministry of Environment and Natural Resources, National Institute of Ecology and Climate Change. https://unfccc.int/files/focus/long-term_strategies/application/pdf/mexico_mcs_final_cop22nov16_red.pdf

¹⁵⁷ National Decarbonisation Plan 2018-2050. Government of Costa Rica. <https://unfccc.int/sites/default/files/resource/NationalDecarbonizationPlan.pdf>

¹⁵⁸ Tile Til Eo 2050 CLIMATE STRATEGY "Lighting the way". The Republic of the Marshall Islands.

https://unfccc.int/sites/default/files/resource/180924%20mi%20202050%20climate%20strategy%20final_0.pdf

¹⁵⁹ Tubiana, L. WRI Expert Perspectives: In Climate Action, as in Chess, Forethought Wins <https://www.wri.org/climate/expert-perspective/climate-action-chess-forethought-wins>

Perhaps the most important element of a LTS is its vision. This will typically be captured in a vision statement which describing the overarching goal of the strategy. A good vision statement would be simple, transparent and easy to communicate.

The vision should reflect the main elements of the strategy itself. Specifically, it should be focussed on the **long-term**, it should reflect the climate change aspirations of the country in terms of its resilience to **climate change** and greenhouse gas **emissions** mitigation, and it should recognise that these aspirations need to be aligned with the country's **development** goals.

In practice, the vision might be as simple as a commitment to 'carbon neutrality by 2050, or 'resilient, net zero emission, green economy by 2050'. However, it may also include specific quantitative goals, or include reference to sustainable development objectives Selected example of the vision statements included in other countries LTS' are described in Section 9.

8.5 Process for developing the vision

***“The process of an LTS development can help countries to facilitate the dialogue among stakeholders on how to initiate and translate these [carbon neutral] ambitious transitions into action, considering country-specific circumstances. The LTS development process thus helps to develop a common long-term vision that integrally addresses environmental, economic and just transition aspects.”*¹⁶⁰**

The process of developing the vision is often more important than the final vision itself. Foresight into the future is never perfect, and rarely accurate, but undertaking a visioning exercise allows for the stepping outside of present-day issues and concerns, barriers and challenges, to define a preferred goal that can then act as a focal point to orient decision-making around.

Countries have created their LTS visions in different ways. As noted, some have focussed on mitigation pathways and framed their vision around explicit mitigation goals whereas others have sought to initiate an inclusive process of shaping a vision and strategy for the country that is broader than just a mitigation goal. Figure 5 below summarises the key elements of the creation of the vision: integration with and synthesis of existing visions and strategies in the country to ensure alignment; stakeholder and citizen engagement in shaping the vision and identifying priorities to ensure inclusiveness, fairness and consensus; modelling and other tools and quantitative information to inform pathways and targets, and provide an evidence base for actions; and international narratives and commitments (for example, around net zero emissions by 2050, and interim NDC commitments). The balance and importance of these elements will be country specific.

¹⁶⁰GIZ (2020), “Making Long-Term Low GHG Emissions Development Strategies a Reality. A guide to policy makers on how to develop an LTS for submission in 2020 and future revision cycles”: https://2050pathways.org/wp-content/uploads/2020/06/GIZ_NewClimate_LTS_GuideForPolicyMakers_2020.pdf

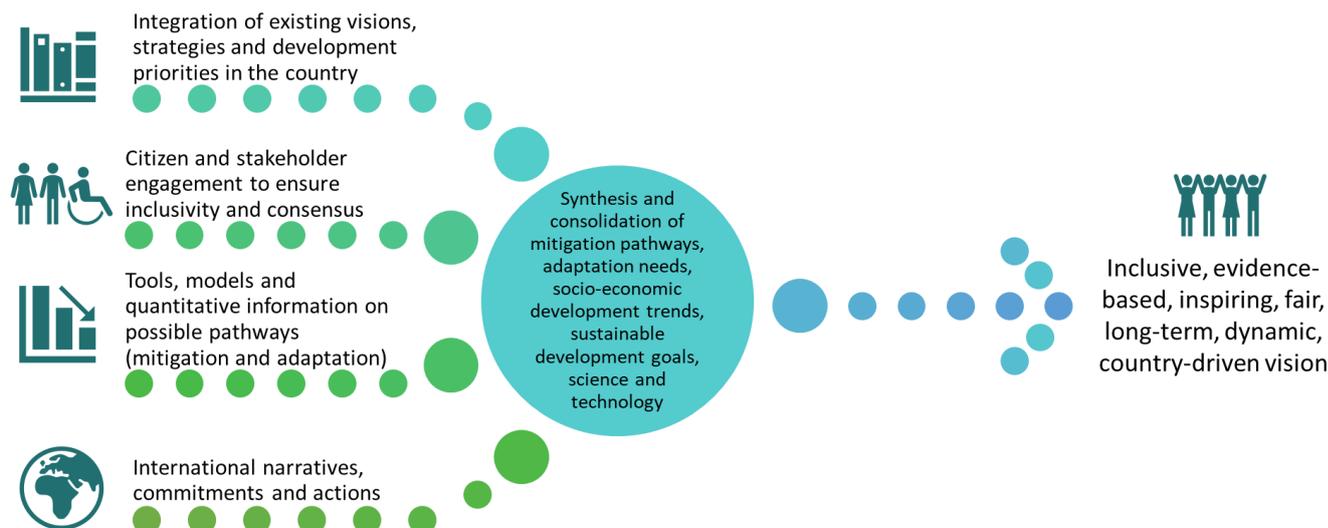


Figure 5: Creating the country vision

Source: Developed by Ricardo Energy and Environment

8.6 Ongoing visioning – a living document

“By making the LTS development an ongoing exercise in creating a vision for the future of a low emissions economy as part of a continuous planning process, policy makers can enhance the LTS’s scope, depth and robustness over time.”¹⁶⁰

It is important that the LTS is not viewed as a one-time exercise, but as a living document. The Paris Rulebook only reiterates the invitation to communicate an LTS by 2020, without specifying requirements for future updates. However, LTSs should be about the *continuous planning process* for two reasons:

1. The LTS vision should aim to support integration of a long-term climate goal with existing plans, providing a longer-term pathway and strategic direction. This helps to ensure consistency and robustness of policy making and that short-term responses are aligned to the long-term vision. A continuous planning process can therefore build upon regularly updated analyses and extensive public and private stakeholder engagement to ensure the vision of the LTS is always reflecting priorities and is fit for purpose.
2. A regularly updated strategy offers the opportunity for updates and responses to changing science and national priorities. A one-time submission in 2020 without further revision would dismiss the idea to make an LTS an ongoing exercise in creating a vision for the future of a low emissions economy *informed by latest science*. Planning for future updates leaves the door open for adoption of new technologies, responding to new challenges or trends, sectoral priorities, or increasing efforts where it is shown this is needed (e.g. international mitigation goals).

8.7 The LTS vision and NDCs

Whilst NDCs set out countries’ medium-term targets, LTSs provide the opportunity to ‘go further’ and link those medium-term targets and actions to a longer term vision and development pathway, and target carbon neutrality for example. NDCs are often not ambitious enough to achieve the reductions in emissions that science demands is necessary, and so LTSs are a crucial opportunity to bring national action in line with the efforts necessary to achieve more ambitious global targets of limiting temperature warming to 1.5 degrees. Setting an ambitious long-term mitigation goal as part of the LTS vision is one way to drive this.

Jordan’s LTS will not be developed in time to inform the current NDC update, but using the five-year revision cycles for Parties to submit their NDCs to the UNFCCC is an opportunity to improve future

submissions and ensure the alignment of medium-term targets (NDCs) with the LTS vision. If policy makers ensure that a country's long-term vision informs subsequent NDC target setting for the medium-term, and incorporates the latest developments in science, policy and technology, then LTSs can be better mainstreamed into policy and implementation planning.

The below figures outline the basic concept on how NDC revision cycles can be informed.

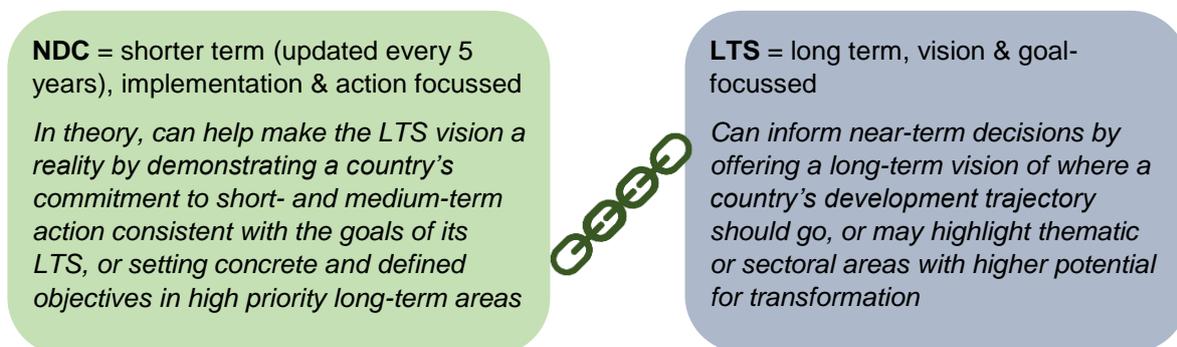


Figure 32: Roles and linkages between the NDC and LTS

Source: Developed by Ricardo Energy and Environment

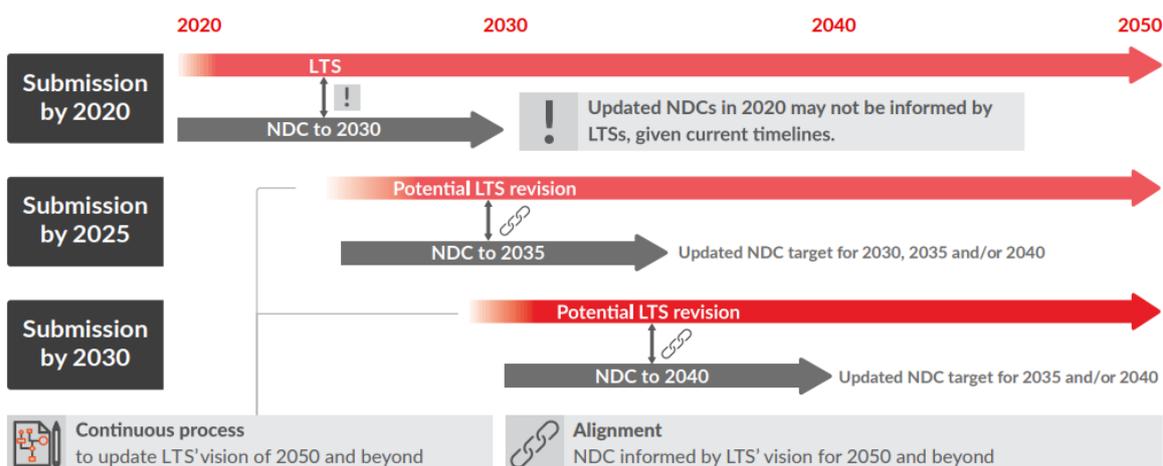


Figure 33: NDC and LTS process. Aligning interim targets can help ensure coherence

Source: GIZ (2020)¹⁶¹

RECOMMENDATIONS

Jordan should ensure that the LTS vision process is framed from the outset as a continual process, aligned to ongoing climate monitoring and reporting efforts, and integrated into sectoral planning processes. By framing the LTS as an overarching vision and strategy, providing strategic direction and a 'climate lens' for decision-makers, whilst being responsive to changing science and trends via regular update, it can maximise stakeholder buy-in and limit the risk of being 'another document'. Ensuring the

¹⁶¹ GIZ (2020), "Making Long-Term Low GHG Emissions Development Strategies a Reality. A guide to policy makers on how to develop an LTS for submission in 2020 and future revision cycles": https://2050pathways.org/wp-content/uploads/2020/06/GIZ_NewClimate_LTS_GuideForPolicyMakers_2020.pdf

process has rigorous stakeholder engagement and is linked to governance structures is also key for successful implementation.

In Jordan, as in many countries, the development of the LTS will not happen in time to inform the updated NDC in 2021, however, it is recommended that in future the Ministry of Environment proactively steers climate policy planning processes to align the NDC revisions with the LTS vision, and future updates to this. This should be done through a coordinated approach to climate policy-making and reporting, ensuring that policy updates and reports are aligned and managed alongside one another through good climate governance and transparent internal communications. This alignment should not just be on a practical level, but also ensuring that NDC targets and actions are prioritised and actioned consistent with the vision and pathway of the LTS, using this as the framework for identifying and delivering on short to medium term priorities.

Jordan should also ensure that any gaps or limitations in the LTS vision and strategy are identified and can be flagged to work towards in the next update. Ideally these updates would be aligned to the update cycle for other key strategies and climate submissions, for instance, the 5-year NDC updates and the Jordan Vision 2025 updates.

9 Long Term Visions: International examples

To inform the vision for Jordan's LTS it is useful to understand the different visions that have been developed by other countries and included in their LTS. A review of selected examples is provided below.

9.1 Example visions

Of the 28 Parties who have submitted an LTS so far, 20 of these are Annex 1 Parties⁵⁷ (last checked: 14/01/2021).

Many LTSs define their vision in terms of a quantified mitigation target for 2050 (often net-zero emissions by 2050, or heavily reduced emissions coming close to this goal). South Africa¹⁶² don't go so far as stating a quantified mitigation target, instead focusing on following a "low-carbon growth trajectory" and enhancing climate resilience, with intentions to eventually move towards a net-zero goal.

Alongside a mitigation component, some visions also include an adaptation-related element. Since many countries have high climate vulnerability, and often relatively low emissions, that may choose to prioritise adaptation efforts in their LTS (taking an "adaptation-first" or "climate resilient" approach, e.g. Uganda¹⁶³).

Often, a combination of these two approaches is taken, with countries defining a long-term mitigation target and then linking this target to complementary adaptation efforts (or a national adaptation plan; NAP) and considering the potential for synergies between the two (good examples of this approach are provided by the LTSs of Fiji⁶⁰ and Costa Rica⁶¹). Integrating adaptation into long-term strategies is considered key to ensuring continued socioeconomic development in the face of climate vulnerability¹⁶⁴ and will likely be a key consideration for Jordan's LTS.

Examples of visions included below:

UK:

The UK did not produce any new work for its long-term strategy, but instead utilised its "Clean Growth Strategy" from 2017. As such, the strategy does not contain a dedicated section for the UK's long-term vision but does state a quantified target of 80% emissions reduction by 2050 relative to 1990, with interim carbon budgets every 5 years (to ensure the country is on track to meet 2050 targets). The strategy has "two guiding objectives: 1. To meet our domestic commitments at the lowest possible net cost to UK taxpayers, consumers and businesses. 2. To maximise the social and economic benefits for the UK from this transition".

As the name of the strategy suggests, continued economic growth is a fundamental long-term objective and is integrated throughout. The strategy therefore approaches its long-term objectives via specific goals for key economic sectors, including: energy efficiency for businesses and industries; energy efficiency in residential buildings; a shift towards low-carbon transport; clean, smart and flexible power supply; low-emissions, high-productivity land; and an energy- and cost-efficient public sector. Technological innovation (in creating new high value jobs, industries, and companies) is considered crucial to achieving the long-term goals of this strategy, which focus significantly on economic and social development (aligned with environmental protection).

Norway:

Norway does not explicitly set out a vision statement for its LTS⁶³, and notes that the LTS does not contain any new international commitments. All targets in Norway's LTS have been taken directly from their Climate Change Act. Nonetheless, the LTS notes that Norway's long-term goal is to transition to a

¹⁶² Government of South Africa (2020), "Low Emission Development Strategy":

<https://unfccc.int/sites/default/files/resource/South%20Africa%27s%20Low%20Emission%20Development%20Strategy.pdf>

¹⁶³ Uganda's LTS is currently in development – lessons are drawn from Ricardo Energy & Environment's ongoing work in country to support the Ugandan government.

¹⁶⁴ World Resources Institute (no year), "Principles in Practice: Integrating Adaptation into Long-term Strategies": <https://www.wri.org/climate/expert-perspective/principles-practice-integrating-adaptation-long-term-strategies>

“*low-emission society*”, with a quantified mitigation target of 80-95% emissions reduction by 2050 stated. However, it is noted that the Government has agreed to strengthen the target to 90–95% and to propose that the Parliament amends the Climate Change Act accordingly to reflect this.

Norway’s strategy also notes the importance of technological transformations to its vision for the future, and states that the transformation to a low-emissions society must also result in a development pathway that safeguards biodiversity and builds a sustainable welfare-based society.

Japan:

Japan’s strategy⁶⁴ includes a section on its long-term vision within Chapter 1, stating that “*Japan proclaims a “decarbonized society” as its ultimate goal and aims to accomplish it ambitiously as early as possible in the second half of this century. Toward that end, Japan has set a long-term temperature goal of reducing GHG emissions by 80% by 2050, and will boldly take measures towards its realization*”. Disruptive innovation is noted key to Japan’s long-term vision, as it will permit continued economic growth while encouraging technological transformations that will allow for a decarbonised yet thriving economy. As such, the strategy notes that “*Japan formulates its long-term low GHG emission economic and social development strategy as a growth strategy*”, highlighting the importance of continued social and economic development to Japan’s long-term vision for the future. This is further highlighted by objectives related to the Sustainable Development Goals, with the strategy stating that “*Japan will aim to maximize the co-benefits with other SDGs in its transition to a decarbonized society*”.

Fiji:

Fiji’s strategy⁶⁰ includes a dedicated “Vision statement” section that states that it aims to reach net zero carbon emissions by 2050 across all sectors of its economy. It references latest Intergovernmental Panel on Climate Change (IPCC) reports, such as the IPCC Special Report on the impacts of global warming of 1.5°C. It also references two Fiji Government reports (a National Development Plan (published 2017) and a Green Growth Framework for Fiji (published 2014)), stating that Fiji’s transition to a low carbon economy is critical to meeting the government’s development objectives (including the SDGs).

It also notes that its vision is underpinned by similar visions contained in national development frameworks, including “a better Fiji for all” which guides the Green Growth Framework report, and aims for “accelerated green growth” that is innovative, integrated, inclusive, inspires, and creates investment for transformational change. It states that these are in line with the “transforming Fiji” vision of the NDP (2017) and that the LEDS integrates emission reduction and sustainable development objectives into sustainable, low carbon, and resilient pathways

Costa Rica:

Costa’s Rica’s Plan⁶¹ states that decarbonization and resilience are recognized as the means to transform the current economic development model into one that is based on bioeconomy, green growth, inclusion, and on enhancing the well-being of all citizens. In order to bring this concept of “decarbonization” into practice, it states that the implemented methodology is anchored in a long-term vision of Costa Rica.

The goal of the Plan is for a decarbonized economy with net-zero emissions in 2050, in a manner consistent with the long-term goal of limiting the increase of average global temperature to 1.5°C above preindustrial levels. It acknowledges that this would require an advanced level of implementation in order to effectively achieve the main transformational processes by 2050, and so sets out three major stages to achieve this which are: a) foundations stage (2018-2022), b) inflection stage (2023-2030) and c) transformation normalization stage or massive deployment (2031-2050).

Finland:

Finland does not explicitly set out a vision statement for its LTS, but states quantified mitigation targets of carbon neutrality by 2035, and an 87-90% reduction of GHG emissions by 2050. The strategy explores different scenarios that could be followed to achieve this – one relies heavily on technological advances such as negative emissions technologies, and one relies on stringent mitigation. The strategy

is almost exclusively focused on climate change goals, with limited reference to alignment with other development goals beyond the mention of some potential social and economic impacts of the strategy.

Netherlands:

The Netherlands does not explicitly set out a vision statement for its LTS, instead drawing its objectives for 2050 from their Climate Act which states quantified mitigation targets of 95% GHG emissions reduction by 2050, and 49% by 2030 (as an interim target). The strategy notes that sustainability improvements and economic growth should go hand-in-hand stating that “*an attractive prospect is an integrated prospect*”. In considering what the Netherlands should look like in 2050 (beyond climate change targets) the Board of Government produced an exploratory study that looked into the question of how the Paris Agreement could make the country “*wealthier, cleaner and more united*”. Thus, social and economic development are also crucial to the Netherlands’ long-term vision for the future. Technological innovation, transformation of the energy system, and enhancement of job opportunities are considered fundamental to achieving these objectives.

South Africa:

The SA-LEDS⁵⁸ contains an Executive Summary that outlines how South Africa, like the rest of the world, is vulnerable to the impacts of climate change. It then references the Paris Agreement and the requirement to reach global peaking of GHG as soon as possible, noting this on the basis of equity and in the context of sustainable development and efforts to eradicate poverty.

The vision statement within South Africa’s LEDS is “*South Africa follows a low-carbon growth trajectory while making a fair contribution to the global effort to limit the average temperature increase, while ensuring a just transition and building of the countries resilience to climate change*”.

It then references its climate change mitigation measures but avoids assigning quantitative values to its ambition to its “Peak, Plateau, and Decline” GHG emissions pathway.

Lastly, it mentions how the implementation of the Strategy will also contribute directly and indirectly to the meeting of Sustainable Development Goals (SDGs), and that the SA-LEDS is based on three key climate policy documents in South Africa, which are: The National Development Plan, The National Climate Change Response Policy, and a forthcoming Climate Change Bill that will form the legislative foundation for the climate change adaptation and mitigation response.

Republic of the Marshall Islands:

The Republic of the Marshall Islands’ (RMI) strategy references that their 2050 Climate Strategy provides a compass they can use to travel with confidence along a steady course towards the middle of this century. It sets a clear framework for progressing towards net zero greenhouse gas emissions by 2050, as well as transitioning to an economy and society that is resilient and can adapt to the inevitable impacts of climate change.

As one of the world’s lowest-lying and climate vulnerable countries, adapting to climate impacts is an increasingly pressing national priority, including with respect to women, men and children in rural communities who have limited access to resources and services and so are particularly vulnerable.

It continues with referencing that the country is experiencing increasingly damaging effects from climate change and seeing more frequent and intense events, such as drought, floods and swells, and tropical cyclones and storms.

In addition, these adaptation and vulnerability issues, it also references that it has rapidly embraced renewable energy technologies and taken huge strides in energy efficiency. For example, more than 90% of the country’s outer islands have now been completely solarized.

It closes its introduction to the strategy in citing “*The purpose of this 2050 Climate Strategy – which is RMI’s long-term low greenhouse gas emission climate-resilient development strategy under the Paris Agreement - is to outline a long-term pathway for RMI to achieve its objectives for net zero emissions and 100% renewable energy, as well as to facilitate adaptation and climate resilience in a way that ensures the future protection and prosperity of the country and its women, men and youth.*”

Singapore:

Singapore’s long-term strategy “*aspires to halve emissions from its peak to 33 MtCO₂e by 2050, with a view to achieving net-zero emissions as soon as viable in the second half of the century*”. The strategy highlights the importance of fostering innovation and technological transformations to its vision for Singapore in the future, with a goal to “*harness emerging technologies as they mature*” noted as one of the key “*thrusts*” that the LTS is built on. Another of these key “*thrusts*” is “*to transform our industry, economy, and society*”, with green growth opportunities detailed in their own dedicated section of the LTS. The strategy notes Singapore’s historical success in this area, stating that “*geographical constraints have driven us to look into innovative and progressive ways to pursue climate action. Long before climate change became a global concern, Singapore had sought to balance economic growth with environmental protection in a mutually reinforcing manner, and not one at the expense of the other.*” The final of the three key “*thrusts*” on which the LTS is built is to “*pursue and leverage international collaborations*”.

Singapore’s high climate vulnerability means that climate resilience takes high priority in their vision for the future – opportunities to enhance climate resilience are integrated throughout the strategy, and adaptation measures intended to achieve climate resilience are detailed in their own dedicated section.

Examples of LTS vision statements that might be most relevant to Jordan are summarised in [Table 6](#) below:

Table 6: Examples of vision statements from submitted Long-Term Strategies of other countries.

Country	Vision Statement
Fiji ⁶⁰	<i>“Fiji aims to reach net zero carbon emissions by 2050 across all sectors of its economy”</i>
Costa Rica ⁶¹	<i>“Costa Rica commits to becoming a decarbonized economy with net-zero emissions by 2050”</i>
Japan ⁶⁴	<i>“Japan proclaims a “decarbonized society” as its ultimate goal and aims to accomplish it ambitiously as early as possible in the second half of this century. Toward that end, Japan has set a long-term temperature goal of reducing GHG emissions by 80% by 2050, and will boldly take measures towards its realization.”</i>
South Africa ⁵⁸	<i>“South Africa follows a low-carbon growth trajectory while making a fair contribution to the global effort to limit the average temperature increase, while ensuring a just transition and building of the country’s resilience to climate change”</i>
Singapore ¹⁶⁵	<i>“We have put forth a long-term low emissions development strategy (LEDS) that aspires to halve emissions from its peak to 33 MtCO₂e by 2050, with a view to achieving net-zero emissions as soon as viable in the second half of the century.”</i>
Republic of the Marshall Islands ¹⁶⁶	<i>“The purpose of this 2050 Climate Strategy – which is RMI’s long-term low greenhouse gas emission climate-resilient development strategy under the Paris Agreement - is to outline a long-term pathway for RMI to achieve its objectives for net zero emissions and 100% renewable energy, as well as to facilitate adaptation and climate resilience in a way that ensures the future protection and prosperity of the country and its women, men and youth.”</i>

¹⁶⁵ Singapore National Climate Change Secretariat, “Charting Singapore’s Low Carbon and Climate Resilient Future”: <https://unfccc.int/sites/default/files/resource/SingaporeLongtermlowemissionsdevelopmentstrategy.pdf>

¹⁶⁶ Republic of the Marshall Islands (2018), “2050 Climate Strategy”: https://unfccc.int/sites/default/files/resource/180924%20rmi%202050%20climate%20strategy%20final_0.pdf

9.2 Relationship between the vision and other key elements of the LTS including sectoral plans

9.2.1 Interim targets

Alongside a vision for 2050, many countries have also chosen to include interim targets in their LTS, providing short/mid-term goals that will keep the country on track to meet their 2050 target. The UK, for example, provides interim carbon budgets at five-year intervals that are in line with their long-term vision of an 80% reduction in GHG emissions¹⁶⁷ (Figure 34).

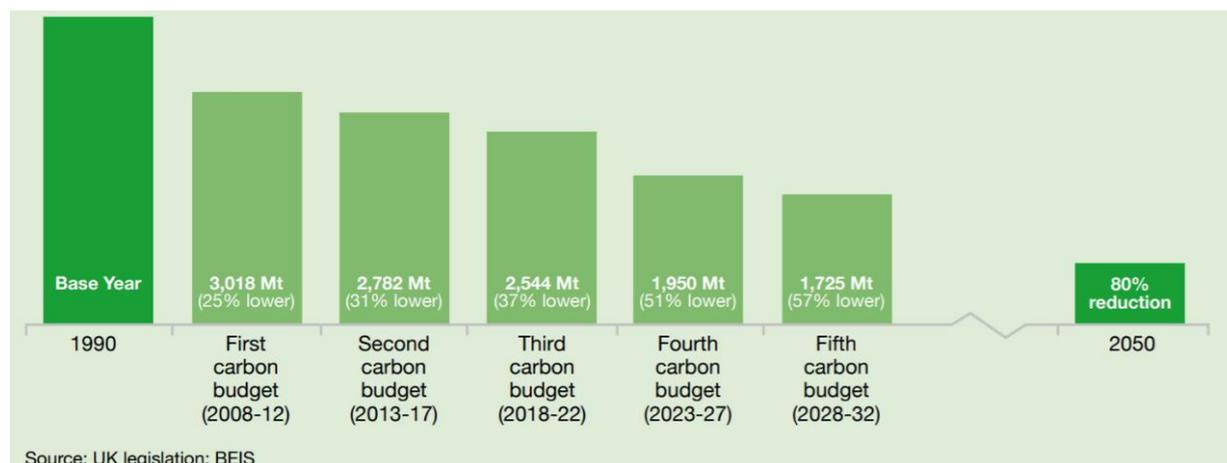


Figure 34: A schematic of the UK's long-term vision and interim targets.

Source: UK Clean Growth Strategy¹⁶⁸

9.2.2 Adaptation

Whilst an LTS is framed by the Paris Agreement as a “mid-century, long-term low greenhouse gas emission development strateg[y]”, predominantly intended to support mitigation goals, countries are encouraged to be “mindful of Article 2 taking into account their common but differentiated responsibilities and respective capabilities”. Whilst the LTS vision should preferably include the country’s quantified mitigation target, there is growing recognition that the LTS should be aligned to national climate priorities, and for many countries the priority is enhancing reliance to climate change.

9.2.3 Existing plans and synergies

As noted above, it is also good practice to link the LTS vision to NDCs and other relevant policy, as this enables evaluation of potential synergies and/or trade-offs between the measures outlined in the LTS and wider plans. Additionally, aligning the LTS with sector-specific plans is important as the achievement of national climate change goals relies on the achievement of various sectoral targets. Existing sectoral plans may also help inform the national decarbonisation pathway.

Below are selected examples of other countries’ experiences of aligning their LTS with sectoral plans and national development priorities.

1. Fiji

¹⁶⁷ UK Department for Business, Energy and Industrial Strategy (2018), “Clean Growth Strategy”: <https://unfccc.int/sites/default/files/resource/clean-growth-strategy-amended-april-2018.pdf>

¹⁶⁸ UK Department for Business, Energy and Industrial Strategy (2018), “Clean Growth Strategy”: <https://unfccc.int/sites/default/files/resource/clean-growth-strategy-amended-april-2018.pdf>

Fiji in particular provides an excellent example of linking their LTS vision to existing plans, focusing on providing synergies with sustainable development plans, and detailing sector-specific policy links throughout their LTS⁶⁰. For example, the “Existing Policy and Regulatory Framework” section for the AFOLU sector in Fiji’s LTS details numerous existing policies for the sector as well as relevant sector-specific priorities that should be considered (e.g., protection of native land, sustainable forest management, and a diversified and economically and environmentally sustainable agriculture economy). This detailing of sectoral plans and the relevance to their LTS clearly demonstrates how their LTS is aligned. For example, rural electrification is a key objective of the National Energy Policy – the LEDS integrates this into renewable energy plans, and considers that the achievement of this objective will positively impact emissions by decreasing reliance on fuelwood and kerosene. This sectoral approach also aids identification of synergies: “Chapter 5 examines the climate change adaptation and resilience dimensions of implementing the LEDS, including synergies between sectoral decarbonisation pathways and adaptation, as well as adaptation in the context of Fiji’s economy-wide LEDS vision.”

2. Costa Rica

Costa Rica’s climate strategy⁶¹ also aims to facilitate transformation of economy, to aid achievement of national development priorities. The decarbonisation pathway set forth in the strategy for each sector is also influenced by development needs in that sector. For example, in the transport sector the decarbonisation pathway focuses on “*development of a mobility system based on safe, efficient and renewable public transport and active mobility schemes*”. For the energy sector, the decarbonisation pathway aims to achieve “*consolidation of the national electricity system with capacity, flexibility, intelligence and resilience, necessary to supply and manage renewable energy at a competitive cost*”.

3. South Africa

South Africa’s long-term strategy⁵⁸ explores transformation pathways in various sectors and aligns them with existing sectoral plans. In the energy sector, for example, the low carbon transition is aligned with the Integrated Energy Plan (IEP): “The IEP provides the overall future direction for the energy mix in South Africa, and thus represents a key instrument for driving the move to a low carbon future”. In this way, existing sectoral plans act to inform the national decarbonisation pathway.

9.3 Linking the vision to developmental benefits, SDGs and other well-being and socio-economic goals

While some countries have used their LTS to simply communicate existing measures under a new long-term vision (Norway, for example, notes that the commitments outlined in their LTS are derived from their NDC and the Climate Change Act with no new international commitments⁶³), others have used the LTS as an opportunity to build upon their NDCs (e.g. Costa Rica), or link mitigation goals to other long-term development needs (e.g. South Africa⁵⁸). All the LTSs reviewed for this report have integrated social and/or economic development goals into their LTSs, with potential synergies and trade-offs a key consideration for many of their actions. Most have also either integrated adaptation efforts into their LTS or signalled to a separate adaptation policy/document that is intended to complement the LTS.

The more comprehensive documents tend to detail the key challenges they expect to face, with Costa Rica⁶¹ in particular providing a good example of integrating solutions to such challenges into their LTS (see Box 7). In general, developed countries noted contextual challenges surrounding distributional impacts, required behavioural changes, and availability of new technologies¹⁶⁹. For less developed countries, the main contextual challenges noted were linked to adaptation needs, maintaining economic growth, and social development goals (e.g. poverty reduction)¹⁶⁹. Less developed countries also often

¹⁶⁹ The Coalition of Finance Ministers for Climate Action (2020), “Long-term strategies for climate change: A review of country cases”: <https://www.financeministersforclimate.org/sites/cape/files/inline-files/Helsinki%20Principle%201%20-%20Review%20of%20Long-Term%20Transition%20Strategies%2010July2020.pdf>

noted practical challenges, that were most frequently related to capacity (e.g., lack of human resources, lack of established MRV systems etc) and finance¹⁶⁹. Box 7 below provides an example of how such challenges have been integrated into an LTS.

Box 7: Integrating solutions to key contextual challenges into an LTS: A Costa Rica (transport sector) case study

COSTA RICA Error! Bookmark not defined. – **An example of integrating solutions to key challenges into their LTS**

Costa Rica note the following challenges related to the transport sector:

- Low investments in infrastructure (causing, for example, an unsustainable transport model)
- Urban growth (compounding infrastructure challenges).

Solutions to these challenges are integrated into the actions put forth in their LTS, for example:

- *“To implement infrastructure construction plans for active mobility (sidewalks, bike lanes) in priority municipalities.”* (p.35)
- *“To avoid investments in infrastructure that favor (sic) the use of private vehicles rather than public transport as reducing the growth of the light vehicles fleet will be an important factor in achieving high rates of technological change to zero-emissions vehicles.”* (p.39)

The below examples provide further details of how countries have integrated sustainable development, SDGs and socioeconomic issues into their LTSs. A key lesson learned from a review of countries, is that developmental benefits, SDGs and socio-economic issues are an important theme and are commonly mentioned, but the level of mainstreaming and detail on how the strategy will aid achievement of the SDGs is not always considered.

- × **UK:** mentions SDGs but not well detailed

Sustainable development is an important consideration for the UK’s “Clean Growth Strategy” – “*Section 13(3) of the Climate Change Act 2008 states that proposals and policies for meeting carbon budgets must, when taken as a whole, ‘be such as to contribute to sustainable development’*”. However, how the strategy will aid achievement of the SDGs specifically is not heavily considered. The only mention of the SDGs states: “*Under the Paris Agreement, as well as seeking to limit warming to well below 2 degrees, and to pursue 1.5 degrees, the UK is committed to working with other countries to achieve global net zero emissions in the second half of the century¹⁵³. This will require a step change in action to tackle climate change and has strong links to how the Sustainable Development Goals will be achieved*”.

- × **Norway:** mentions SDGs but not well detailed

Norway’s long-term strategy notes the importance of achieving the Sustainable Development Goals alongside meeting international climate change targets: “*The success of a transition to a low-emission pathway will both influence and be influenced by the extent to which the world achieves other global objectives such as the UN Sustainable Development Goals (SDGs)*”. Sustainable development opportunities are considered in the LTS, for example: “*The Planning and Building Act is intended to promote sustainable development in the best interests of individuals, society as a whole and future generations*”. However, how the strategy will aid achievement of the SDGs specifically is not considered.

- **Japan:** some detail including a list of initiatives to achieve local decarbonization and the SDGs

Japan’s long-term strategy states that “*Japan will aim to maximize the co-benefits with other SDGs in its transition to a decarbonized society*”. As such, the strategy identifies numerous opportunities for the achievement of the SDGs that are well-aligned with a transition to a decarbonised society. For example, “the Government aims at creating the “Circulating and Ecological Economy,” where each regional

community utilizes regional resources in a sustainable manner, and formulates a self-reliant and decentralized society while building broader networks, in order to advance local decarbonization, and achieve the SDGs with integrated improvements on the environment, economy and society, thereby achieving a carbon neutral, resilient and comfortable community and living by 2050". The strategy also provides a list of initiatives to achieve local decarbonization and the SDGs (see p.51 of the strategy).

✓ **Fiji: places significant focus on the achievement of the SDGs**

Fiji's long-term strategy⁶⁰ places significant focus on the achievement of the SDGs: "*Fiji's transition to a low carbon economy is critical to meeting the government's development objectives, including those elaborated in the NDP (2017) and the Green Growth Framework for Fiji (2014), as well as the internationally agreed Sustainable Development Goals (SDGs) and the 2030 Sustainable Development Agenda*". The 'National circumstances' section of the strategy has a sub-section dedicated to the importance of the SDGs, where it is noted that "*the LEDES aims to support Fiji in meeting the SDGs at the national level by supporting country-driven processes, enhancing integration of decarbonisation strategies into national planning, aligning development and climate change and strengthening coordination, and improving multi-stakeholder engagement and action*". As such, opportunities for achievement of the SDGs are identified throughout the strategy.

✓ **South Africa: uses reference to an existing foundational policy on sustainable development to ensure an equitable transition**

In their LEDES, South Africa notes that "implementation of the Strategy will also contribute directly and indirectly to the meeting of Sustainable Development Goals (SDGs)." This is facilitated by the use of their National Development Plan (NDP) as a key foundational document on which the LTS was built: "*With an overarching objective of eliminating poverty and reduce inequality by 2030, the NDP outlines a set of goals and actions to meet the country's environmental sustainability and resilience needs, and dedicates a full chapter to 'Environmental Sustainability - An equitable transition to a low-carbon economy'*" (p.ix). The use of the NDP as a foundational document for the LTS allows the social development goals of this plan (reduce poverty and inequality) to be integrated into LTS.

○ **Singapore: Sustainable development flagged as important but SDGs only mentioned once**

While the pursuit of sustainable development is an important component of Singapore's long-term strategy, the SDGs specifically are only mentioned once: "*The Singapore Cooperation Programme (SCP) is our flagship technical assistance programme and primary platform for South-South and triangular cooperation. Since its inception in 1992, more than 130,000 officials from over 170 countries have participated in SCP programmes on various issues, including climate action, sustainable cities, health, education and good governance. Our SCP courses are closely aligned with the 17 Sustainable Development Goals.*"

○ **Republic of the Marshall Islands: important concept but few references**

While sustainable development is an important component of the Marshall Islands' long-term strategy, the SDGs specifically are only mentioned once (in the context of integrating gender equality goals (SDG5) with climate change goals (SDG13)).

○ **Costa Rica**: Sustainable development considerations are integrated throughout the LTS, but there is no mention of the SDGs specifically

× **Finland**: Finland's long-term strategy does not reference SDGs.

× **Netherlands**: The Netherlands' long-term strategy does not reference SDGs.

A comparison of all the key features of a selection of already submitted LTSs is provided in the next section.

9.4 International LTS examples: a comparison of key features

The below table summarises the key features of countries' LTSs

Country	Vision / Goal	Sectoral Coverage	Interim Targets	GHG Scope	Links to Other Policies	Integration of Other National Plans/Priorities	Challenges
UK ⁶⁹	"Clean Growth Strategy" 80% emissions reduction by 2050 (relative to 1990)	All sectors (power and hydrogen production, Buildings, Industry, Transport, Aviation and shipping, Agriculture, LULUCF, Waste, fluorinated-gas emissions, GHG removals)	Five-year interim carbon budgets in line with the long-term target.	Mitigation target covers carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF ₆)	Alignment with NDC not clear, no links to adaptation policy	Adaptation needs not mentioned. Key development considerations include how to cut emissions without undermining economic growth, impacts on affordability for consumers, energy security and competitiveness, and wider economic benefits.	Hard to-abate sectors (e.g. agriculture and aviation) where new tech may not be available in time Distributational effects of climate measures and how to inform people about them Hydrogen Heavy Goods Vehicles Uncertainty regarding future economic factors, societal/behavioural changes, new technology availability and costs, potential carbon leakage from increased costs in industry.
Norway ⁶³	80-95% emissions reduction by 2050 (but Gov has agreed to strengthen the target to 90–95% and to propose that the Parliament amends the Climate Change Act accordingly to reflect this).	All sectors (energy, buildings, transport, IPPU (inc. oil and gas), AFOLU, LULUCF, waste)	Reduce emissions by at least 50% (previously 40%, but updated in 2020) and towards 55% compared to 1990 levels by 2030	Not explicitly stated, but the body of the report mentions carbon dioxide, methane and nitrous oxide (though methane and nitrous oxide are briefly mentioned only once each)	Commitments derived from NDC and Climate Change Act (i.e. no new international commitments).	Green growth, green jobs (replacing those in oil/gas industry), green competitiveness, diversified economy, sustainable development.	Ageing population, technological shifts (upheaval of existing infrastructure), Norway's oil and gas industry (i.e., industrial/economic challenge), social equity and inclusivity. Limited provision of potential solutions.
Japan ⁶⁴	Mitigation focused, with aims for a "decarbonised society". Quantified target	All sectors, with cross-sectoral measures	No interim targets (apart from NDC 2030)	Not stated explicitly, but the body of the report mentions	No mention of how LTS links to NDC or NAP. Reference to existing	Promotes measures that integrate mitigation and adaptation measures.	Ageing population, ageing infrastructure, intensifying global

Country	Vision / Goal	Sectoral Coverage	Interim Targets	GHG Scope	Links to Other Policies	Integration of Other National Plans/Priorities	Challenges
	of 80% emissions reduction by 2050.		goals), and very minimal analysis of emissions reductions associated with proposed actions/policies	carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF ₆), and nitrogen trifluoride (NF ₃)	policy limited to brief mention of 6 existing 'Acts'. Actions set out in LTS are mostly based on existing measures	Economic growth, technological innovation, and sustainable development goals also key national priorities.	competition, costs, technological shifts and timeliness of technological developments. Limited provision of potential solutions.
Fiji ⁶⁰	Net-zero carbon emissions by 2050, with adaptation a clear focal point	All sectors (electricity and other energy use; land transport; domestic maritime transport; domestic air transport; AFOLU; waste)	NDC states 2030 target Scenario based approach provides quantified trajectories under each scenario	Not explicitly stated, but GHG scope is given for each sector individually. GHGs mentioned: carbon dioxide, methane and nitrous oxide	Links to NAP, NDP, TNC, Green Growth Framework, National Forest Policy (REDD+ embedded in this), Mangrove Management Plans, National Integrated Waste Management Strategy 2016-2025 etc Existing policies detailed for every sector	Adaptation measures heavily integrated into LTS (or LEDS, as they call it), with potential synergies between mitigation and adaptation detailed SDGs linked to climate action Key focus was to provide synergies with sustainable economic growth M&E framework includes assessing co-benefits in terms of green jobs, gender inclusion, SDGs and others LTS will inform future NDCs	Adaptation. The major issues are: 1) Information, knowledge and technology barriers; 2) Governance and institutional barriers; 3) Financial barriers; 4) Economic barriers; 5) Natural and biological adaptation barriers and limits. Additionally, the importance of evidence-based decision making and well-managed public finances have been identified as key areas in need of special attention in order to successfully implement necessary adaptation measures.
Costa Rica ⁶¹	Mitigation-focused "decarbonisation plan" (i.e. net-zero emissions by 2050) to be complemented by NAP	10 axes of decarbonisations (p.31) cover all sectors (energy, buildings IPPU, waste, AFOLU, transport)	Action-based targets given for periods 2019-2022, 2023-2030, and 2031-2050.	Not explicitly stated, but carbon dioxide, methane and nitrous oxide are mentioned in the body of the report.	LTS to be complemented by NAP and Costa Rica Strategic Plan 2050 Clear links to National Development and Public Investments Plan (PNDIP 2018-2022) and Nationally	Cross-cutting strategies clearly outlined (p.31) Green growth plans, SDGs etc all integrated into LTS Section 4 = How LTS will aid transformation of economy	Low economic productivity (financial bottleneck) Low investments in infrastructure (causing, for example, unsustainable transport model, neglected

Country	Vision / Goal	Sectoral Coverage	Interim Targets	GHG Scope	Links to Other Policies	Integration of Other National Plans/Priorities	Challenges
					Determined Contributions (NDCs)	(development as a co-benefit) Solutions to key challenges are integrated into LTS via cross-cutting with development goals (e.g. many actions aim to improve infrastructure) Importance of adaptation noted, with LTS to be complemented by NAP	wastewater treatment infrastructure and poor solid waste management) Urban growth (compounding infrastructure challenges). Solutions integrated via other development goals (see "Integration")
Finland ¹⁷⁰	Carbon neutral by 2035, 87-90% reduction of GHG emissions by 2050	Energy supply, industry, transport, agriculture, LULUCF, and waste management.	Carbon neutral by 2035	Not explicitly stated, but carbon dioxide, methane and nitrous oxide are mentioned in the body of the report.	Links to National Climate Change Adaptation Plan, Climate Change Act No specified link to NDC	Adaptation issues are referenced, and are based on the National Climate Change Adaptation Plan 2022 Social and economic priorities are integrated, and impacts of climate policy on these areas are analysed	Attitudinal/behavioural changes (especially those related to mobility, shifts to more plant-based diets, general consumption patterns) Role of political governance Ageing population Development of Finnish forests (and soil) and their role as carbon sinks Technological development and their availability Uncertainties related to carbon removal technologies Economic structural changes Agricultural sector

¹⁷⁰ Finland Ministry of Economic Affairs and Employment (2020), "Finland's long-term low greenhouse gas emission development strategy": https://unfccc.int/sites/default/files/resource/LTS_Finland_Oct2020.pdf

Country	Vision / Goal	Sectoral Coverage	Interim Targets	GHG Scope	Links to Other Policies	Integration of Other National Plans/Priorities	Challenges
Netherlands ¹⁷¹	95% GHG emissions reduction by 2050	Built environment, mobility, industry, agriculture and land-use, and electricity.	49% GHG emissions reduction by 2030 (compared to 1990)	Not explicitly stated and no mention of specific GHGs in body of report	<p>No specified link to NDC</p> <p>The climate adaptation policy has been laid down in the National Climate Adaptation Strategy (NAS) 2016 and the NAS Implementation Programme.</p> <p>Clear links to the Climate Act (2019)</p>	<p>Analysis of cross-cutting issues important for various sectors (such as labour market and educational needs, information campaigns and issues related to spatial planning)</p> <p>A key priority is to achieve targets in a way that is feasible and affordable for everyone. This means ensuring the lowest possible impact on the household budget and a fair distribution of burdens between households and businesses, while maintaining a level playing field for the business sector</p> <p>Adaptation not mentioned – treated as separate policy area (i.e., not integrated)</p>	<p>and peat energy use; and new district heating sources.</p> <p>Social and competitiveness impacts of the climate policies.</p> <p>Key stakeholders did not want overall tax burden to increase significantly.</p> <p>Reducing building emissions may be difficult due to prevalence of individual gas boilers and the need to retrofit households.</p>
South Africa ⁵⁸	Vision statement: “South Africa follows a low-carbon growth trajectory while making a fair contribution to the global effort to limit the average temperature increase, while ensuring a just transition and building of the country’s resilience to climate change”	Energy (supply and demand), industry, AFOLU and waste (plus cross-sectoral measures)	Low carbon growth trajectory to be followed	Not explicitly stated (Figure 4 on p.14 is only mention of N ₂ O, HFCs and PFCs / methane is mentioned a few more times)	<p>Three key climate policy documents provide the foundation on which SA-LEDS has been developed:</p> <p>The National Development Plan (NDP)</p> <p>The National Climate Change Response Policy (NCCRP)</p>	<p>Social development goals of NDP (e.g. reduce poverty and inequality) are integrated, with NDP a key foundational document for LTS</p> <p>Identifying opportunities for jobs is a key priority for the low-carbon transition</p>	<p>Energy poverty, developmental challenges, adaptation challenges (e.g., building resilience in poorer communities), financing and investment (and need for international support), research and innovation challenges.</p>

¹⁷¹ The Netherlands Ministry of Economic Affairs and Climate Policy (2019), “Long term strategy on climate mitigation”: https://unfccc.int/sites/default/files/resource/LTS1_Netherlands.pdf

Country	Vision / Goal	Sectoral Coverage	Interim Targets	GHG Scope	Links to Other Policies	Integration of Other National Plans/Priorities	Challenges
	<p>Absence of “agreed quantitative articulation of the vision” means national GHG emissions trajectory (Fig.5, p.20) is used as the benchmark against which the performance of SA-LEDS will be measured.</p> <p>Commitment to move towards a goal of net zero carbon emissions by 2050</p>				<p>The Climate Change Bill (forthcoming)</p> <p>Links to National Adaptation Strategy (meant to complement LTS) – future iterations of LEDS will further elaborate on adaptation needs</p>		
<p>Republic of the Marshall Islands¹⁷²</p>	<p><i>“The purpose of this 2050 Climate Strategy – which is RMI’s long-term low greenhouse gas emission climate-resilient development strategy under the Paris Agreement - is to outline a long-term pathway for RMI to achieve its objectives for net zero emissions and 100% renewable energy, as well as to facilitate adaptation and climate resilience in a way that ensures the future protection and prosperity of the country and its women, men and youth.”</i></p>	<p>Energy (with cooking and lighting in it’s own section), Transport, Waste.</p>	<p><i>32% reduction of GHG emissions by 2025, based on 2010 levels.</i></p> <p><i>Indicative commitment to reduce GHG emissions by 45% by 2030, based on 2010 levels</i></p> <p><i>A projected straight-line intended NDC trajectory to achieve RMI’s stated aspiration of net zero GHG emissions by 2050.</i></p>	<p>All GHGs</p>	<p>National Energy Policy and Energy Action Plan, National Gender Mainstreaming Policy</p>	<p>Social goals (e.g. gender and human rights), sustainable development considerations, and opportunities for economic co-benefits are integrated throughout</p>	<p>Raising support to assist with adaptation efforts remains a significant challenge (i.e., finance)</p> <p>Technology limitations</p>

¹⁷² Republic of the Marshall Islands (2018), “2050 Climate Strategy”: https://unfccc.int/sites/default/files/resource/180924%20rmi%202050%20climate%20strategy%20final_0.pdf

Country	Vision / Goal	Sectoral Coverage	Interim Targets	GHG Scope	Links to Other Policies	Integration of Other National Plans/Priorities	Challenges
Singapore ¹⁷³	<i>“Our LE DS aspires to halve emissions from its peak to 33 MtCO₂e by 2050, with a view to achieving net-zero emissions as soon as viable in the second half of the century”</i>	All sectors	Enhanced NDC – <i>“to peak our emissions at no higher than 65 million tonnes of carbon dioxide equivalent (MtCO₂e) around 2030”</i>	CO ₂ , CH ₄ , N ₂ O, F-gases, NF ₃	Numerous relevant policies and plans are detailed on p.152-157	Adaptation plans are integrated within LTS, sustainable development and green growth opportunities objectives are also integrated	Technology limitations (e.g. energy storage to manage the intermittency challenge of solar photovoltaics, high cost of new technologies) Limited alternative energy sources (limited land area, high urban density, relatively flat land, low wind speeds and lack of geothermal resources / challenges to harnessing offshore winds due to busy maritime traffic in our waters) Dependency on imports

¹⁷³ Singapore National Climate Change Secretariat, “Charting Singapore’s Low Carbon and Climate Resilient Future”: <https://unfccc.int/sites/default/files/resource/SingaporeLongtermlowemissionsdevelopmentstrategy.pdf>

9.5 Framework for Jordan’s Long-Term Vision

Based on the analysis of literature and international experience presented in the above sections, the following recommendations are made for the key components a long-term vision that Jordan should seek to address:

Vision component	Description and Recommendations
Long-term focus	<p>Recognition of the timeframe to which the strategy relates (noting that the strategy needs to cover the entire period). The UNFCCC secretariat specifically states that countries should submit “<i>mid-century, long-term low greenhouse gas emission development strategies</i>”. Literature widely supports 2050 as the appropriate ‘long-term’ date.</p>
Detail adaptation and/or climate resilience visions/goals	<p>The LTS vision should ensure it is “mindful of Article 2 taking into account [countries] common but differentiated responsibilities and respective capabilities”. Adaptation could therefore be integrated into the LTS, which allows for consideration of synergies between mitigation and adaptation, or the LTS could point toward a complementary adaptation document such as the NAP.</p> <p>The LTS vision can also go further and be explicit about the balance between mitigation, adaptation and other development priorities, clearly laying out the approach the country wishes to take on climate change, recognising country circumstances.</p>
Alignment with recent and current strategies	<p>The vision statement should reference how it aligns with the visions, objectives and goals of recent and current strategies that are of national importance to Jordan. For example, the NDC or key strategic planning documents. It can also reference existing development goals and policy areas.</p>
International context	<p>The vision statement should contextualise the international importance of the strategy to the UNFCCC. Not many countries have yet put forward an LTS, so the vision should explicitly reference the LTS’ position as a report for the UNFCCC for clarity.</p>
Quantified target	<p>Countries so far have predominantly committed to a net zero or carbon neutrality goal by 2050. Although there is wide recognition that the LTS should focus on national priorities, and some countries are taking an ‘adaptation first’ approach, an LTS is nonetheless intended to provide details of the country’s low greenhouse gas emission development. The LTS should therefore state the country’s 2050 mitigation goal and ideally, the scope, such as which GHGs and sectors (e.g. economy wide) the target will cover.</p>
Interim targets	<p>The LTS vision can also note interim targets (e.g. reduction of X 2030; targets for every X years etc) that will keep the country on track for their 2050 target. This will also be important for alignment with, for example, the NDC.</p>

10 Jordan's Existing Visions and Goals

As described above, it is important that the vision for the LTS is consistent with the long-term climate and development goals contained within existing Jordanian national report and strategies i.e. that the LTS aligns with Jordan's development goals. Therefore, a review has been carried out of the key national and sub-national plans and strategies in Jordan, and the results are presented below.

In total, the review considered 22 existing long-term plans and strategies identified as having visions (or goals/objectives) that would be relevant to the LTS. This includes national plans/strategies, but also sectoral plans, and also plans prepared at sub-national level. Each of the relevant plans and strategies are described in Appendix A. The summary findings of this review are provided below in Table 7.

10.1 Review approach

The review was organised in accordance with the a series of seven criteria. These criteria, that are used as the table's column headers, are described below:

- **Plan / Strategy** – Specifies the relevant plan or strategy that includes the vision/goal/objective. Footnote reference added where resource is available online.
- **Vision / Goal / Objective** – Specifies the relevant vision/goal/objective as included in the respective document. Some include both a vision and a goal/objective. The goal may have adaptation or mitigation component. Relevant target values and units stated where available.
- **Spatial scale** – Specifies if the goal is national, or sub-national e.g. specific region/city (if applicable).
- **Sectoral scope** – Specifies if the goal is for all sector, or specific sector (if applicable).
- **GHG scope** – Specifies if the goal if for all greenhouse gases, or just a sub-set
- **Climate risks** – Specifies if the goal include all climate risks, or just a sub-set
- **Target year** – Specifies the target year (if applicable).
- **Milestone** – Specifies and interim milestones for the targets
- **Interactions** – Specifies the relationship with any of relevant documents or strategies
- **Other** – Captures any other relevant information

Table 7: A compilation of existing long-term climate visions/goals/objectives in Jordan.

Plan/ Strategy	Vision/goal/objective	Spatial scale	Sectoral scope	GHG scope	Climate risks	Target year	Milestones	Interactions	Other
1 INDC (2015) ¹⁷⁴	Mitigation target of 14% (1.5% unconditional and 12.5% conditional) compared to BAU scenario (p.1) Sector-specific adaptation objectives (p.10-18)	National	Mitigation = all sectors (energy inc. transport; IPPU; agriculture; LULUCF; waste) Adaptation = water; health; agriculture; biodiversity/ecosystems; sustainable development	CO ₂ / CH ₄ / N ₂ O / SF ₆ / PFCs / HFCs	Water security; food security; health; natural hazards	2030	Mitigation actions and KPI-style targets to be implemented by 2025, in line with Jordan 2025 commitments (p.8)	Jordan 2025 (p.8) TNC (p.1)	KPI-style “target” of 11% of renewable energy share in the total energy mix in 2025 (p.6)
2 TNC (2014) ¹⁷⁵	Mitigation goal: “ <i>aims at identifying and assessing potential economic, social and policy measures and human interventions that can be implemented in Jordan to reduce anthropogenic emissions of greenhouse gases (GHGs) in different sectors at the national level</i> ” (p.17) Adaptation goal: “ <i>to contribute to developing and updating the national</i>	National	Mitigation = all sectors (energy inc. transport; IPPU; agriculture; LULUCF; waste) Adaptation = water; agriculture; biodiversity/ecosystems; coastal areas;	CO ₂ / CH ₄ / N ₂ O / SF ₆ / PFCs / HFCs	Water security; food security; health; natural hazards	NA	Individual mitigation actions have proposed timelines of implementation	NDC (projection and targets)	Through a National Energy Strategy, Jordan has goals to increase the share of new and renewable energy in the energy mix, aiming for 7% by 2015 and 10% by 2020 (p.50) The NEEAP (National Energy Efficiency Action Plan endorsed in 2013) which sets a national energy efficiency target of 20% by 2020 (p.52)

¹⁷⁴ Ministry of Environment (2015), “Intended Nationally Determined Contributions”: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Jordan%20First/Jordan%20INDCs%20Final.pdf>

¹⁷⁵ Ministry of Environment (2014), “Jordan’s Third National Communication on Climate Change”: <https://www.undp.org/content/dam/jordan/docs/Publications/Enviro/TNC%20jordan%20pdf.pdf>

Plan/ Strategy	Vision/goal/objective	Spatial scale	Sectoral scope	GHG scope	Climate risks	Target year	Milestones	Interactions	Other
	<i>knowledge on climate conditions based on Jordan's past, present and future climate scenarios and their resulting impacts on key human and natural systems" (p.110)</i>		urban sector; health sector						Goals to reduce energy consumption in public buildings by 10% (p.52)
3	First BUR (2017) ¹⁷⁶	Goals/objectives not explicitly stated (but linked to NC3 and Jordan 2025)	National	Mitigation analysis for all sectors (energy inc. transport; IPPU; agriculture; LULUCF; waste)	CO ₂ / CH ₄ / N ₂ O / SF ₆ / PFCs / HFCs / NMVO Cs	NA	NA	NA	TNC (p.69) Jordan 2025 (p.69) "The total renewable capacity by end of 2020 will be 1350 MW accounting for 25% of all installed generating capacity and contributing 20% to generated electricity" (p.23) "Nuclear power to supply the country with 30% of its demand for electricity by 2030, with surplus destined for export (p.23)
4	Climate Change Policy 2013-2020 ¹⁷⁷	<i>"The long-term goal of the Climate Change Policy ... is to achieve a pro-active, climate risk-resilient Jordan, to remain with a low carbon but growing economy, with healthy, sustainable, resilient communities, sustainable water and agricultural resources, and thriving and productive ecosystems in the path towards</i>	National	Mitigation = energy; transport; agriculture; LULUCF; waste (IPPU deemed "no priority" – p.21) Adaptation = water; agriculture	CO ₂ / CH ₄	Water security; food security; desertification; biodiversity loss; health; natural hazards	2020	NA	Aims to "Provide an overarching (umbrella/ high level) guidance for the Government of Jordan" so intended to interact with all policies. Framed as The main short-term objectives of the policy are summarised as: <ul style="list-style-type: none"> • Provide an overarching (umbrella/high level) guidance for the Government of Jordan (GoJ) to implement the climate change objectives • Work towards the integration of vulnerability and climate change

¹⁷⁶ Ministry of Environment (2017), "Jordan's First Biennial Update Report to the UNFCCC": <https://unfccc.int/sites/default/files/resource/Jordan%20BUR1.pdf>

¹⁷⁷ Ministry of Environment (2013), "Climate Change Policy 2013-2020": https://www.jo.undp.org/content/dam/jordan/docs/Publications/Climate%20change%20policy_JO.pdf

Plan/ Strategy	Vision/goal/objective	Spatial scale	Sectoral scope	GHG scope	Climate risks	Target year	Milestones	Interactions	Other
	<p><i>sustainable development"</i> (p.14)</p> <p><i>"The objective of the Policy (2013-2020) is to build the adaptive capacity of communities and institutions in Jordan, with consideration for gender and addressing the needs of vulnerable groups, to increase the resilience of natural ecosystems and water as well as agricultural resources to climate change, and to optimize mitigation opportunities"</i> (p.14)</p> <p>Note that this policy is currently undergoing an update</p>		<p>(inc. food security, land use and desertification) ; biodiversity; coastal areas; disaster risk; tourism</p>					<p>more of a strategic document or guiding framework, i.e. it does not contain specific actions</p>	<p>impact assessment and the adaptation measures into key relevant sectors' policies, strategies, and legal framework, in particular water, agriculture/food security, health, biodiversity, combating desertification, and tourism;</p> <ul style="list-style-type: none"> • Encourage mitigation and adaptation strategies that maximize health co-benefits, and minimize unintended consequences (adverse health impacts); • Work towards the integration of climate change mitigation objectives into key relevant sectors' policies, strategies and legal framework, in particular energy, transport, and waste; • Ensure that the interests of vulnerable groups, with emphasis on the poor, youth and gender are adequately addressed in mitigation and adaptation policies and strategies and integrate climate change mitigation and adaptation aspects into national sustainable development

Plan/ Strategy	Vision/goal/objective	Spatial scale	Sectoral scope	GHG scope	Climate risks	Target year	Milestones	Interactions	Other
									<p>and green growth policies, strategies, and legal framework taking into account gender mainstreaming and the role and needs of youth and elderly people;</p> <ul style="list-style-type: none"> • Mainstream climate change considerations in infrastructure planning and services as well as landuse planning; and • Provide a ground to secure sufficient financial support, and strengthen institutional and human resources capacities ... including providing access to regional and international financing resources and capacity building initiatives and programs
5	Jordan 2025 ¹⁹⁶	<p>““Jordan 2025” charts a path for the future and determines the integrated economic and social framework that will govern the economic and social policies, based on providing opportunities for all. Its basic principles include promoting the rule of law and equal opportunities, increasing participatory policy making, achieving fiscal sustainability and</p>	National	NA	NA	NA	2025	<p>KPIs and corresponding targets (for 2025, and interim years 2017 and 2021) are detailed on p.75-126</p> <p>“Jordan 2025” is referenced in NDCs, First BUR, and NGGP</p>	<p>The Vision is shaped around 4 pillars:</p> <ul style="list-style-type: none"> • Citizens: Active citizens with a sense of belonging • Society: Safe and stable society • Business: Dynamic and globally competitive private sector • Government: Efficient and effective government

Plan/ Strategy	Vision/goal/objective	Spatial scale	Sectoral scope	GHG scope	Climate risks	Target year	Milestones	Interactions	Other
	<p><i>strengthening institutions”</i> (p.13)</p> <p><i>This strategy is currently undergoing an update as part of the ‘Executive Development Programme’ to 2025</i></p>								
6	National Green Growth Plan (NGGP) ²⁰⁴	<p>“Behind the National Green Growth Plan is a clear vision for Jordan as a country with an expanding and sustainable economy that creates jobs, income for its citizens, and is resilient to external shocks and instability in the region. A country of economic opportunity for everyone that provides decent work and living conditions based on an environmentally sustainable economic growth model.” (p.3)</p>	National	Six priority sectors (transport; waste; water; energy; agriculture; tourism)	NA	NA	NA	NA	<p>Builds upon NDC (p.ii) and is closely aligned with Jordan 2025 vision (p.34). Also the basis for the GG-NAPs.</p> <p>“To grow the country’s economy at an average real growth rate of 5.7% per year between 2015 and 2025, with the 2025 target at 7.5% real GDP growth” (p.34)</p> <p>A noted weakness of the NGGP is its lack of a climate change target. The policy has traction in ministries but is not viewed as a ‘climate’ strategy.</p>
7	Green Growth National Action Plans (GG-NAPs) ^{220,221,223,229,231,232}	Same vision as NGGP – GG-NAPs are intended to aid achievement of this vision (p.xi)	National	Six priority sectors (transport; waste; water; energy; agriculture; tourism)	NA	NA	2021-2025	Specific actions/objectives for each sector each have estimated implementation period	<p>GG-NAPs intended to aid achievement of NGGP vision (p.xi)</p> <p>All the GG-NAPs are structured around 5 thematic areas or goals:</p> <ol style="list-style-type: none"> 1. Enhance Natural Capital 2. Sustainable Economic Growth 3. Social Development and Poverty Reduction 4. Resource Efficiency

Plan/ Strategy	Vision/goal/objective	Spatial scale	Sectoral scope	GHG scope	Climate risks	Target year	Milestones	Interactions	Other
8	National Adaptation Plan (Draft) ¹⁷⁸	<p><i>“Through its NAP process, Jordan intends to achieve a pro-active, climate risk-resilient nation, to remain with an increased resilience of its communities and institutions, natural ecosystems, water and agricultural resources in the path towards sustainable and climate-resilient development. Jordan seeks to continuously build adaptive capacity by reducing the country’s vulnerability through implementing comprehensive adaptation measures with consideration for gender aspects and the needs of the most vulnerable groups.”</i></p>	National	<p>Vulnerability assessment conducted for: Agriculture; Water; Urban; Eco-systems and Biodiversity; Health; Socioeconomic sectors</p>	n/a	<p>exposure assessment at the TNC identified the main climate change-related hazards (e.g. droughts, floods, heat waves, cold waves, increasing temperature, increasing aridity etc)</p>	<p>climate projections were obtained for the years 2035, 2055 and 2075</p>	n/a	<p>Presents past observed data, climate change projections and potential climate impacts on key vulnerable sectors as per the TNC and “other sources (studies analyzing climate risks and vulnerabilities in Jordan)”. The NAP is still in draft and it is unclear whether there will be further amendments before publication. If so, these will need to be considered</p>
9	Rural Women and Climate Change in Jordan (2018) ²³⁷	To identify and develop gender-sensitive strategies to respond to the environmental and humanitarian crises caused by climate change	National	Agriculture as a key sector for rural women	NA	NA	NA	NA	<p>Linked to SDG review and NAP NA</p>

¹⁷⁸ National Adaptation Plan (Draft) - Not available online

Plan/ Strategy	Vision/goal/objective	Spatial scale	Sectoral scope	GHG scope	Climate risks	Target year	Milestones	Interactions	Other	
10	First Voluntary National SDGs Review (2017) ²¹¹	<p><i>“Jordan aspires to further strengthen national ownership of the 2030 Agenda and accelerate its implementation”</i> (p.3)</p> <p>Key/priority SDGs: SDG1 (No Poverty), SDG2 (No Hunger), SDG3 (Good Health and Well-being), and SDG5 (Gender Equality), and SDG9 (Industry, Innovation and Infrastructure)</p>	National	Working Groups (which define long and short-term objectives and actions based on the EDP and in alignment with the SDG goals, targets and indicators) are split into 19 sectors (see p.6)	NA	NA	2030	NA	<p>Jordan 2025;</p> <p>Executive Development Programmes (EDPs – translate Jordan 2025 into actionable programmes over 3-to-4-year cycles);</p> <p>Jordan Response Plan (JRP)</p>	EDP provides “actionable and measurable development programmes through three or four-year cycles” that are harmonious with SDGs and 2030 Agenda (p.5) – no details on actual targets (EDP is separate document)
11	National Agricultural Development Strategy (2020-2025) ¹⁷⁹	Objective to digitize and restructure the agricultural sector and to boost its productivity	National	Agriculture sector	(relevant to AFOLU sector but not mentioned in the report)		2025		<p>The strategy identified a total of 174 interventions and projects that will be financed through a host of channels, including the Treasury; from the Agricultural</p>	<p>Increase agricultural GDP as a share of total GDP from 2.6 billion JD now to 3.66 billion JD by 2025 and boosting the added-value of agriculture to 2.48 billion JD from 1.6 billion JD</p> <p>Increase the forest area by 10% by 2025.</p> <p>Create 65,000 jobs in the five-year period and replacing 21,000 foreign workers with Jordanians</p>

¹⁷⁹ National Agricultural Development Strategy - Not available online

Plan/ Strategy	Vision/goal/objective	Spatial scale	Sectoral scope	GHG scope	Climate risks	Target year	Milestones	Interactions	Other
								Credit Corporation and from foreign aid and grants	<p>Increase the number of farmers using digital government-run agricultural services by 30%</p> <p>Reduce export costs to facilitate a 15% increase in agricultural exports.</p> <p>Increase the productivity of food and agricultural manufacturers by 18% by 2025</p>
12	Jordan Long-term National Transport Strategy ²⁰²	<p><i>“MoT vision is to have a developed and sustainable transport sector, distinguished for competency, safety and environmental stability, enhancing the socio-economic development and making Jordan a regional hub for transport.”</i> (p.63)</p>	National	Transport sector	CO ₂ (and pollutants: NO _x ; VOC; CO; PM _{2.5})	NA	2024-2030	Target delivery years for individual actions given on p.77-78 (roads), p.83 (railways), p.86 (civil aviation), p.89 (port and maritime), p.93-94 (public transport), and p.98 (freight transport and logistics)	<p>No links explicitly stated</p> <p>Identifies “policy pillars”:</p> <ul style="list-style-type: none"> • Complete the existing networks • Make the best use of the existing facilities • Pursue a multimodal approach • Combine infrastructure investments and policies • Make the best of private participation in the transport sector • Protect the environment and reduce negative impacts • Emphasize the regional dimension • Have citizens at the core of the transport policy

Plan/ Strategy	Vision/goal/objective	Spatial scale	Sectoral scope	GHG scope	Climate risks	Target year	Milestones	Interactions	Other
13	Jordan's National Energy Sector Strategy for 2020-2030 ¹⁸⁰	<p>Aims to set a roadmap to increase self-sufficiency through utilization of domestic natural and renewable resources, as well as expansion of existing energy developments thus reducing reliance on costly foreign fuel imports that burden its economy</p> <p>To improve energy efficiency in all sectors by 9%</p> <p>Aims to reduce GHG emissions by 10% by 2030 from BAU scenario</p>	National	Energy sector	All GHGs	n/a	2030	2030	<p>The recent release of the IRENA Renewables Readiness Assessment is likely to support the targeted growth in renewables</p> <p>4 main objectives are identified:</p> <ul style="list-style-type: none"> • Diversification of energy sources by increasing the contribution of local energy sources to the total energy mix. • Increasing energy efficiency in all sectors. • Reducing energy costs for the national economy. • Developing the energy sector system in Jordan to make it a regional centre for the exchange of energy in all its forms. <p>Renewable energy to contribute 31% of electricity generation by the year 2030.</p> <p>Increase energy efficiency in the water sector by 15% by 2025.</p> <p>The strategy targets oil shale for achieving energy self-sufficiency, along with renewables. It assumes a rate of 15% oil shale contribution to electricity generation in</p>

¹⁸⁰ Ministry of Energy and Mineral Resources (2020), Energy Sector Strategy [Arabic] https://www.memr.gov.jo/AR/Pages/%D8%A7%D8%B3%D8%AA%D8%B1%D8%A7%D8%AA%D9%8A%D8%AC%D9%8A%D8%A9_%D9%82%D8%B7%D8%A7%D8%B9_%D8%A7%D9%84%D8%B7%D8%A7%D9%82%D8%A9?View=1059

Plan/ Strategy	Vision/goal/objective	Spatial scale	Sectoral scope	GHG scope	Climate risks	Target year	Milestones	Interactions	Other	
14	Jordan National Water Strategy 2016-2025 ¹⁹⁹	<p><i>“This strategy focuses on building a resilient sector based on a unified approach for a comprehensive social, economic and environmentally viable water sector development” (see ‘Foreword’)</i></p> <p><i>“The national goal for this strategy will be to “ensure availability and sustainable management of water and wastewater for all Jordanians” (p.32)</i></p>	National	Agriculture, wastewater, industry, tourism	NA	Severe weather, erratic rainfall, drought, increasing temperatures, high evaporation rates, depleting groundwater recharge (p.48)	2025	<p>Targets for 2025 include:</p> <p>“Increase storage capacity to 400 MCM” (p.25)</p> <p>“ensure that all citizens have ... 120, 100 and 80 litres/capita /day for major urban centres, small towns and rural areas respectively” (p.33)</p> <p>“Reducing the overall energy consumption in public water facilities by 15% and increasing the share of renewable energy to</p>	<p>Builds upon Jordan 2025 vision</p> <p>Acts as a foundation document for numerous other documents (listed on page before Table of Contents)</p>	<p>2020, to remain as such until 2030.</p> <p>Specifically, by 2025 the strategy aims for:</p> <ul style="list-style-type: none"> • A resilient water sector • Access to safe, affordable and adequate water supply and sanitation for all Jordanians • Adequate wastewater collection and treatment facilities for cities, small towns and major industries and mines are provided • Public health and the environment, in particular groundwater aquifers, are protected. • Efficient and productive use of water including cost recovery • Responsible and efficient water management for all uses based on Integrated Water Resources Management (IWRM) principles including greater understanding and more effective management of groundwater and surface water

Plan/ Strategy	Vision/goal/objective	Spatial scale	Sectoral scope	GHG scope	Climate risks	Target year	Milestones	Interactions	Other
							10% of the overall power supply” (p.35) “80% of the population with access to wastewater collection and treatment services by 2025” (p.37)		<ul style="list-style-type: none"> • A skilled and sustainable water sector adapting to increased population and economic development • Innovative and efficient technologies, infrastructure and partnerships • A viable and targeted legal and regulatory framework • Well-resourced climate change adaptation plan • Well-resourced humanitarian WASH sector coordination system • Sector alignment and synergy with relevant national priorities and development plans
15	The Amman Climate Action Plan: A Vision for 2050 ¹⁸¹	A vision for 2050: <i>“To transform the city of Amman to become a sustainable, green and liveable city that works efficiently to preserve its resources for future generations.”</i> (p.7) Mitigation target of 99.5% emissions reduction (from	Sub-national (Greater Amman Municipality)	Energy, transport, waste, water (p.17 and p.24)	CO ₂ , CH ₄ , N ₂ O	Irregular rainfall, drought, flooding, extreme temperatures, extreme weather events (p.11)	2050 2030 interim target stated as key milestone (p.18)	Links to Amman Resilience Strategy	Interim target of a 40% reduction from baseline levels by 2030 (p.20)

¹⁸¹ Greater Amman Municipality (2019), “The Amman Climate Action Plan: A Vision for 2050”: https://www.amman.io/site_doc/climate.pdf

Plan/ Strategy	Vision/goal/objective	Spatial scale	Sectoral scope	GHG scope	Climate risks	Target year	Milestones	Interactions	Other
16	Amman Resilience Strategy ¹⁸²	baseline scenario) by 2050 (p.20)							
	"Having Amman a city that is an organized, modern, smart, safe, attractive, lively, friendly, viable, proud of its heritage and its roots" (p.9)	Sub-national (Greater Amman Municipality)	Goals (p.60-74) cover energy, buildings, water and waste	NA	Flash floods (p.52), blizzards (p.31) water scarcity (p.71), drought and heatwaves (p.30)	Most goals for target year 2025 (see p.134-139)	NA	Links to Amman CAP	Specific targets and implementation timelines are listed on p.134-139 E.g. increase public transport by 40% by 2025 (p.135) E.g. Reduction of waste going to landfill by 50% by 2025 (p.137) E.g. Reduce energy consumption by 50% by 2025 (p.137)
17	Deir Alla Municipality Local Climate Action Plan ¹⁸³	"Ahead of 2030, the Municipality of Deir Alla will strive to be a pioneering, organized, clean, soulful and eco-friendly city that takes advantage of all technologies, strategies and know-how to safeguard its resources and to integrate the members of its community to realize Deir Alla's full potential as a city emblematic of sustainable development that cherishes its heritage and ingenuity." (p.V)	Sub-national (Deir Alla Municipality)	Energy, transport, waste, industry, agriculture, (for adaptation, also urban development, health, biodiversity/ecosystems)	Not explicitly stated	Decreased rainfall, droughts, higher temperatures, extreme weather events (p.15-18)	2025-2030 (see p.viii)	NA	Uses climate projections from TNC for adaptation analysis (p.25) Mitigation goals and target years for individual measures given on p.viii

¹⁸² Greater Amman Municipality (2017), "Amman Resilience Strategy": https://resilientcitiesnetwork.org/downloadable_resources/Network/Amman-Resilience-Strategy-English.pdf

¹⁸³ Deir Alla Municipality Local CAP - Not available online

Plan/ Strategy	Vision/goal/objective	Spatial scale	Sectoral scope	GHG scope	Climate risks	Target year	Milestones	Interactions	Other
18 Aqaba Special Economic Zone Authority: Sustainable Energy and Climate Action Plan (SE-CAP) ¹⁸⁴	<i>"The overall target that has been set for 2030 is 14% CO2 emissions reduction (according to the Intended Nationally Determined Contribution - INDC). The second scenario developed focuses on achieving an emission reduction of 40%. Under both scenarios, emphasis is placed on working closely with all community actors."</i> (p.19)	Sub-national (Aqaba SEZ)	Energy and buildings, transport, waste (Industry neglected due to data constraints / agriculture neglected as it is not relevant for mitigation in the region) (p.27) Adaptation also covers water, tourism, health, ecosystems and agriculture (p.100)	Not explicitly stated, but body of reports mentions methane (CH ₄) as well as carbon dioxide (CO ₂)	Extreme heat, landslides, droughts and floods (p.100)	2030	NA	Mitigation targets from INDC Mitigation actions are in line with national policy (namely, TNC)	Sectoral actions and targets for each scenario are detailed on p.76-80
19 Busaira Municipality Local Climate Action Plan ¹⁸⁵	<i>"Along the path to the year 2030, the Municipality of Busaira will strive to be a prosperous city by fostering social harmony, safeguarding the natural beauty of city through environmentally conscious practices, enhancing resourceefficient and</i>	Sub-national (Busaira Municipality)	Energy, transport, waste, industry, agriculture, (for adaptation, also urban development, health,	Not explicitly stated	Decreased rainfall, droughts, higher temperatures, extreme weather	2025-2030 (see p.2)	NA	Uses climate projections from TNC for adaptation analysis (p.18)	Mitigation goals and target years for individual measures given on p.2

¹⁸⁴ ICCS (2012), "Aqaba Special Economic Zone Authority: Sustainable Energy and Climate Action Plan": [https://www.climamed.eu/wp-content/uploads/files/Jordan-Aqaba-Special-Economic-Zone-Authority-Sustainable-Energy-and-Climate-Action-Plan-\(SECAP\).pdf](https://www.climamed.eu/wp-content/uploads/files/Jordan-Aqaba-Special-Economic-Zone-Authority-Sustainable-Energy-and-Climate-Action-Plan-(SECAP).pdf)

¹⁸⁵ Busaira Municipality Local CAP - Not available online

Plan/ Strategy	Vision/goal/objective	Spatial scale	Sectoral scope	GHG scope	Climate risks	Target year	Milestones	Interactions	Other
20 Ayoun Municipality Local Climate Action Plan ¹⁸⁶	<p><i>establishing the Municipality of Busaira as a model for sustainable development" (p.iv)</i></p> <p><i>"By 2030, the Municipality of Ayoun will strive to be a model of efficient resource management and a model for sustainable development (solar energy, rainwater), through the implementation of Actions and the involvement of the local community and stakeholders at a high level to enhance the practical application of innovative strategies and technologies, to catalyze behavior change to reduce emissions (mitigation), to employ strategies to reduce and eliminate the impacts of climate change (adaptation), and to promote equality and justice (gender mainstreaming) to cultivate an economically robust city" (p.V)</i></p>	Sub-national (Ayoun Municipality)	<p>biodiversity/ecosystems)</p> <p>Energy, transport, waste, industry, agriculture, (for adaptation, also urban development, health, biodiversity/ecosystems)</p>	Not explicitly stated	<p>events (p.9-12)</p> <p>Decreased rainfall, droughts, higher temperatures, extreme weather events (p.14-18)</p>	2025-2030 (see p.vii-viii)	NA	Uses climate projections from TNC for adaptation analysis (p.25)	Mitigation goals and target years for individual measures given on p.vii-viii
21 Karak Municipality: Sustainable Energy and Climate Action	<i>"The overall target that has been set for 2030 is 14% CO2 emissions reduction (according to the Intended Nationally Determined</i>	Sub-national (Karak	Energy and buildings, transport, waste	Not explicitly stated, but	Extreme heat, landslides, droughts	2030	NA	Mitigation targets from INDC	Sectoral actions and targets for each scenario are detailed on p.72-76

¹⁸⁶ Ayoun Municipality Local CAP - Not available online

	Plan/ Strategy	Vision/goal/objective	Spatial scale	Sectoral scope	GHG scope	Climate risks	Target year	Milestones	Interactions	Other
	Plan (SE-CAP) ¹⁸⁷	<i>Contribution - INDC. The second scenario developed focuses on achieving an emission reduction of 40%.” (p.17)</i>	Municipality)	(Industry neglected due to data constraints / agriculture neglected as it is not relevant for mitigation in the region) (p.24) Adaptation also covers water, tourism, health, ecosystems, and agriculture (p.94-100)	body of report mentions methane (CH ₄) as well as carbon dioxide (CO ₂)	and floods (p.93)			Mitigation actions are in line with national policy (namely, TNC)	
22	Greater Irbid Municipality: Sustainable Energy and Climate Action Plan (SE-CAP) ¹⁸⁸	Mitigation goal: <i>“The Municipality of Greater Irbid ... has committed to reduce its overall emissions to at least 40 % below 2015 levels by 2030, conditionally and subject to availability of international financial aid and support.” (p.15)</i> Vision: <i>“A Municipality that is economically developed,</i>	Sub-national (Greater Irbid Municipality)	Energy and buildings, transport, water, waste Adaptation also covers tourism, health, ecosystems, agriculture and forestry	CO ₂ only (p.23)	Extreme heat and droughts (p.100)	2030	NA	Mitigation targets from INDC Actions are in line with national policy (namely, TNC)	NA

¹⁸⁷ ICCS (2012), “Karak Municipality: Sustainable Energy and Climate Action Plan”: https://www.ces-med.eu/sites/default/files/1711_SECAP%20Karak%20-%20SET.pdf

¹⁸⁸ ICCS (2012), “Greater Irbid Municipality: Sustainable Energy and Climate Action Plan”: https://www.ces-med.eu/sites/default/files/171117_SECAP%20of%20Greater%20Irbid%20Municipality_SET_rev2.pdf

Plan/ Strategy	Vision/goal/objective	Spatial scale	Sectoral scope	GHG scope	Climate risks	Target year	Milestones	Interactions	Other
	<p><i>sustained and culturally preserved to invest in the sectors of agriculture, industry and tourism and that stimulates entrepreneurship, empowerment and sustainability for the purposes of employment, capacity building of individuals, and improving the quality of life of all community's groups at present time and in the future, in cooperation with local and international partners." (p.20)</i></p>								

10.2 Wider development goals

Alongside the specific goals and objectives that are included in the relevant plans and strategies it is also important to ensure that the vision of Jordan's LTS takes into account Jordan's development goals, issues and priorities.

10.2.1 Development context

Jordan is classified as a country of high human development and an upper-middle income country with a population of 10.554 million inhabitants according to Jordan Statistical Yearbook of 2019¹⁸⁹, with 755,050 capita registered as refugees, among them approximately 664,226 Syrians. A young population with 33.6 percent under the age of 15, about 62.5 percent of the population is between the age of 15 and 64, and 3.9 percent is above 65 years old.

The population of Jordan has doubled more than 10 times over the past 55 years due to forced migration. According to a report released by the Department of Statistics in 2019, the population of Jordan has increased from about 586,000 in 1952 to 10.309 million by the end of 2018¹⁹⁰.

The country has had to deal with the impacts of Syria's civil war; approximately 80% of the Syrian refugees in Jordan live in urban areas in the north of Jordan, while the remaining 20% live in the Za'atari, Mrajeab al-Fahood, Cyber City, and Al-Azraq camps. This has placed a huge burden on the country's infrastructure, public services, and natural resources. The additional pressures on energy contributed to high growth rate in energy and electricity demand. A high number of Syrian refugee children have been enrolled in Jordan's already crowded public schools. Housing costs in the north have risen by 300%, according to government data. The annual cost of providing for the refugees is roughly USD 2.9 billion (8% of Jordan's GDP), according to the BUR1, of which only 5.5% has been covered by the international community. The arrival of more than 200,000 Syrian workers (around 10% of Jordan's workforce), who are willing to work at below market wages, has placed downward pressure on local wages.

The Jordanian economy is one of the smallest economies in the region. Jordan's top contributing sectors to GDP are government services, finance, manufacturing, transport, as well as tourism and hospitality. A lack of natural resources, a high population growth rate, the ongoing regional conflicts, the rising cost of health care, and the growing expectations of people have posed challenges to the country's sustainable social and economic development. The government identified poverty and unemployment as two of the most important challenges facing the country. Jordan is one of the Arab countries with the lowest employment rates for both men and women, among those above the age of 15; the percentage of unemployment is 23.9 in Q3/2020. Of those economically active, the percentage of males was 56.4% of the total labour force in Jordan, compared with 15.4% for females. The employment rate for women rises with their educational level. Only 15.3% of women with less than secondary education were employed in 2018 (MoL, 2018).

The average annual household income was about 11242 JD in 2017. According to the latest household income and expenditure survey, the average annual income from employment of a female-headed household was about 9534 JD, while for a male-headed household it was 11519 JD, which shows a gender pay gap of 17%¹⁹¹ (with female participation in the Jordanian labour market of around 15 per cent according to World Bank 2019 figures).

Families headed by women tend to be among the poorest of the poor. They have fewer economic assets than households headed by men. For example, only 44% of households headed by women own agricultural land and 30% own livestock. In contrast, 68% of households headed by men own land and 36% of them own livestock. Similarly, only 21% of women who are heads of households receive loans

¹⁸⁹ Jordan Department of statistics (DOS), <http://dosweb.dos.gov.jo/publications/>

¹⁹⁰ Ibid.

¹⁹¹ DOS, 2017-2018

for agricultural development and 9% receive loans for income-generating activities, compared to 43% and 14% for men who are heads of households¹⁹².

10.2.2 COVID-19

The COVID-19 pandemic has further exacerbated these challenges and placed unprecedented pressure on the economy and society. Jobs and losses in productivity with impacts on poverty, industries, food security as well as the direct health impacts, have had catastrophic effects on the country, and particularly the national debt and ability to provide key services. At present, there is “no time for long term future planning” only responding to current needs (for example, the budget of the new government has not been approved nor the EDP is published).

Jordan will need to put in place recovery plans to deal with the aftermath – including the human, societal and economic costs. The Covid-19 pandemic has also been widely acknowledged as an opportunity to initiate a shift, and ‘Build Back Better’ (BBB) in ways that are more sustainable, resilient and lower carbon. This needs to start immediately for Jordan, and strategies for this must emphasise the environmental as well as the social and economic dimensions. The government, development partners, private sector, NGOs and social enterprises need to come together to find solutions for the implications of COVID-19. BBB measures on high priority as COVID-19 unfolds in Jordan include trade diversification, digitization, and enabling social enterprises, which can create innovative approaches to value chain efficiency and inclusion¹⁹³.

COVID-19 recovery strategies and wider Covid-19 recovery plans should be a critical input to the LTS vision process, and the LTS vision process and long-term climate ambition should equally inform the BBB strategy. Identifying ‘green’ technologies, projects and investments that not only shift the pathway but deliver recovery objectives will provide win-wins. The MoE and LTS development team should therefore work closely with those leading COVID-19 recovery efforts, and the MoE should also seek to inform and input to these at the earliest opportunity to ensure recovery plans are not supporting unsustainable actions and lock-in to pathways that are not compatible with lower carbon emissions and greater climate resilience.

At present, COVID-19 recovery planning is in the early stages (as the pandemic is still ongoing) so recommendations on specific interventions at this point are not possible. But the vision of the LTS can provide an opportunity to support recovery if undertaken in parallel.

10.2.3 SDGs

COVID-19 recovery and the LTS vision process must also align with existing and new strategies to deliver on the SDGs and improve equality. Addressing for example, gender equality and economic participation issues is fundamental to achieving the vision set out in Jordan 2025, the basic principles of which include promoting the rule of law and equal opportunities, increasing participatory policy making, achieving fiscal sustainability and strengthening institutions.

The 2017 Voluntary National SDGs report of Jordan addressed the following key SDGs: SDG1 (No Poverty), SDG2 (No Hunger), SDG3 (Good Health and Well-being), and SDG5 (Gender Equality), and SDG9 (Industry, Innovation and Infrastructure). It has also considered other priorities for Jordan with a focus on: Education (SDG4), Water (SDG6), Energy (SDG7), Prosperity and Decent Work (SDG8), Environment and climate change (SDG13), and Justice, human rights, and participation (SDG16).

These SDGs are critical to reflect in the vision.

10.2.4 Gender and youth

Gender mainstreaming is a priority element of Jordan’s First Voluntary National SDGs Review, and the document concludes that Jordan should continuing to mainstream gender throughout all national

¹⁹² IFAD, Rural Poverty in Jordan, (<http://www.ruralpovertyportal.org/web/guest/country/home/tags/jordan>)

¹⁹³ World Bank *et al.* (2020), “Jordan Food Security Update: Implications of COVID-19”: https://docs.wfp.org/api/documents/WFP-0000122056/download/?_ga=2.127815437.1606268654.1611058242-1458411177.1611058242

development plans in line with the SDGs, mapping gender indicator gaps and the establishment of a gender database. Specific documents and strategies that Jordan can build on for gender mainstreaming include the report ‘Rural Women and Climate Change in Jordan’¹⁹⁴, which specifically aims to identify and develop gender-sensitive strategies to respond to the environmental and humanitarian crises caused by climate change. Jordan 2025¹⁹⁶ has culture and youth as key focus and emphasises that addressing gender equality and economic participation issues is fundamental to achieving the vision, the basic principles of which include promoting the rule of law and equal opportunities, increasing participatory policy making, achieving fiscal sustainability and strengthening institutions. Lastly, local climate actions plans (Deir Alla, Busaira and Ayoun municipalities) integrate aspects of mitigation, adaptation and gender mainstreaming to strategically respond to local climate change impacts. In particular, they use a framework to strengthen the work of municipalities and partners in the development of climate change-related interventions, programs and activities, which take into account the needs of all members of society: males and females, young people, children and adults, people with disabilities, the poor, and the marginalized. The framework consists of activities that were incorporated in Actions where possible, to enhance the outcomes and improve local resilience. These activities were the result of a Gender Mainstreaming Exercise and Assessment during the Baseline Analysis phase of the local climate action plan development, and applied to sections including ‘Identification of Actions’, the ‘Implementation of the Action’ and the ‘Evaluation of Actions’.

Whilst gender considerations will be dealt with under a separate task in the main roadmap, the above examples demonstrate both the importance of including gender (and youth, marginalised and vulnerable groups) considerations, and the opportunities to enhance equality through the LTS and climate actions. The first step for this is inclusion within the vision.

The LTS vision and development process is coming at a challenging time for Jordan, and many countries, who are increasingly under pressure to deliver on economic, social, health, as well as environmental challenges. If the LTS vision process can be aligned with these parallel activities for a “green and sustainable recovery”, there can be win-wins. This will also help to ensure that the LTS vision process is not de-prioritised as a result of these pressures.

10.3 Conclusions and findings

10.3.1 Conclusions from key strategies to inform the vision

Jordan 2025 is a key document to consider currently in the framing of the LTS and its vision, as the main strategic and forward-planning document for the country. The assumptions and goals of this plan should be one starting point – together with climate objectives – for the framing of a long-term vision and the quantitative analysis that will support the pathway development (for example, growth assumptions). The draft Executive Program for 2021-2025 currently in development should be the main reference for the LTS vision, once updated. It is recommended to work closely with MoPIC to ensure that the LTS and future updates to the strategy are aligned. There is also an opportunity to approach MoPIC to explicitly include climate change in the Executive Program, or subsequent updates of this, which will build on the vision. As neither Jordan 2025 or the Executive Program go beyond 2025, there is an opportunity for the LTS and the vision within in, to support MoPIC’s development of future updates in the longer term and ensure that both the LTS and future Jordan vision strategies follow pathways that align.

The Climate Change Policy and the Draft NAP are both key documents for the framing of climate-specific goals and visions. However, the former is currently being updated and the latter is yet to be finalised and published, and so there may be expected to be some changes. It will be important to ensure the latest versions and any updates are included in the framing of the vision.

The First Voluntary National SDGs Review is not in itself a high priority document, but SDGs in general are key in the governmental planning process¹⁹⁵ and so the review findings are critical to take into

¹⁹⁴ UN Women (2018), “Rural Women and Climate Change in Jordan”: <https://data2.unhcr.org/en/documents/details/66494>

¹⁹⁵ MoPIC stakeholder

account in the LTS vision. Although not explicitly a ‘vision’ or goal, the statement highlighted above is often repeated by stakeholders and summarises the country’s ambitions in relation to the SDGs.

The National Green Growth Plan is not in itself a specific ‘climate’ strategy, is short term and does not include targets for climate change, but it does have traction in ministries and is considered an important guide for decision-making, in particular on implementing actions. The vision of this strategy may therefore be important for the LTS, give it will resonate with stakeholders and allow for connections to be made between these two areas of activity. The GG-NAPs are also structured by key sector, and these sectors are likely to reflect preferences for future sectoral structures.

The COVID-19 pandemic has exacerbated ongoing social, economic and equity challenges, but presents an opportunity to ‘Build Back Better’ and connect a long term vision of resilience, low emissions, socioeconomic development, equality of opportunity (with a focus on women, youth, vulnerable and marginalised groups), with economic recovery through ‘green’ industries and development.

10.3.2 Conclusions from sector strategies

Jordan’s National Energy Sector Strategy for 2020-2030 is a very important strategy for guiding future development of the sector and therefore emissions, significant given the large share of total GHGs from energy in Jordan. It will be critical for framing the energy (and emissions) transition pathways for Jordan, at least to 2030. It indicates that the country’s vision is for greater energy diversification and local renewable energy development, but with no reduction in the share of electricity met by oil shale (high emissions intensity). This would likely not be consistent with long term decarbonisation pathways and so Jordan will likely need to review the post-2030 energy pathway and consider ‘steeper decline’ scenarios. This strategy is also the most recent mitigation target to be set – a 10% reduction on BAU by 2030 from the energy sector. However, this reduction target is significantly below the level of ambition most countries are targeting in medium and long-term plans. Jordan therefore needs to consider whether there is scope for increasing this target through, for example, further increasing the renewable energy share.

The Jordan Long-term National Transport Strategy includes aspiration of low carbon technologies under the pillar ‘*Protect the environment and reduce negative impacts*’ and well reflects the need to include citizens and societal benefits also. It does not include specific goals or targets for climate change or low carbon transport modes, and also includes some actions that might be deemed conflicting if not incorporating low carbon technologies (i.e. road building to encourage road transport, would need to prioritise electric and low emission vehicles).

The Jordan National Water Strategy and the 2020-2025 National Agricultural Development Strategy are the most important for climate adaptation. Water energy efficiency is also a theme in the Energy Strategy, so it has relevance to mitigation also. Water and Agriculture are both key sectors in the NDC and the Draft NAP and so it will be important to integrate sector goals. In particular, both focus not only on improved resilience and resource management, but also growth as a sector, new technologies for improved and more efficient management, digitalization, job creation and export potential (for agriculture). The Agriculture strategy includes few direct references to climate change however.

Lastly, Health has been an increasingly important sector, as evidenced by the COVID-19 pandemic, and so the National Climate Change Health Adaptation Strategy and Action Plan of Jordan (2013-2017), whilst not yet targeted for an update, may become important. In particular, reflecting on the linkages between health, disease, future climate trends, shocks, and the need for resilience. The strategy notes that “*Improving health systems is a clear “no-regrets” option for adaptation*”. This also links to strategies such as the Jordan Response Plan (2020-2022), which whilst also not intended to be updated at present, sets out a pioneering model on humanitarian crisis response and shows Jordan’s enduring commitment to continue to build an integrated multi-year framework to most effectively respond to Syria crisis in a transparent, collaborative and sustainable manner in line with the Global Compact on Refugees and the 2030 Agenda.

10.3.3 Suggested themes for Jordan's vision

From the review of existing climate, development-related and sectoral visions/goals in Jordan, a number of themes can be identified that could form the basis of Jordan's LTS vision. These are further described in the next section.

1. **Climate resilient, low carbon, healthy, inclusive, and sustainable communities and institutions, that ensure opportunities are evenly distributed**
2. **A country with an environmentally sustainable economic growth model resilient to external shocks and instability – pro-actively delivering prosperity, improved quality of life and jobs for all citizens, particularly youth, women and vulnerable groups**
3. **A society that is inclusive, considers youth and gender, delivers improved quality of life for vulnerable groups, and ensures no one is left behind**
4. **Sustainable, self-sufficient and efficient energy and transport sectors, meeting needs through high levels of deployment of local renewables and low carbon technologies**
5. **Sustainably managed natural and agricultural resources, and thriving and productive ecosystems, to enhance climate resilience**
6. **A country with a focus on participatory policy making, fiscal sustainability and strong institutions, with decision-making based equally on social, economic and environmental goals**
7. **Liveable and sustainable towns and cities that are clean, modern, safe, environmentally-conscious, and work efficiently, to promote their heritage and preserve resources for future generations**

10.3.4 Summary of visions and commitments by sector

The below table provides a summary of the key visions and commitments made in both cross-cutting and sector strategies.

Table 8: A summary of some of Jordan's existing visions/goals/objectives that should be taken into account in the framing of the vision. See relevant documents for full details and more objectives.

Sector	Key Visions / Goals / Objectives	Relevant Documents
Mitigation	<p>INDC target: 14% GHG reduction (1.5% unconditional / 12.5% conditional)</p> <p>Local SE-CAP targets: Greater Irbid has committed to reduce emissions by at least 40 % below 2015 levels by 2030 (conditional). Aqaba and Karak have also adopted this 40% target, but as a secondary scenario.</p> <p>Amman has committed to net zero emissions by 2050 in the 'Amman Climate Plan'</p> <p>The National Energy Strategy 2020 – 2030 aims to reduce CO₂ emissions by 10% by 2030.</p>	<p>NDC</p> <p>Local SE-CAPs</p> <p>The Amman Climate Plan</p> <p>National Energy Sector Strategy 2030</p>
Adaptation	<p>Climate Change Policy 2013-2020:</p> <ul style="list-style-type: none"> • To build the adaptive capacity of communities and institutions in Jordan, with consideration for gender and addressing the needs of vulnerable groups, to increase the resilience of natural ecosystems and water as well as agricultural resources to climate change, and to optimize mitigation opportunities <p>NAP: Key areas to be targeted in adaptation efforts:</p> <ul style="list-style-type: none"> • Water Sector: • Agriculture sector • Urban sector • Socioeconomic 	<p>NC3</p> <p>Climate Change Policy 2013-2020</p> <p>National Adaptation Plan</p> <p>Prioritised List of NDC Actions</p> <p>Technology Needs Assessment</p>

	<ul style="list-style-type: none"> Ecosystems and biodiversity Health 	
Energy Sector	<p>National Energy Sector Strategy:</p> <ul style="list-style-type: none"> To increase self-sufficiency through utilization of domestic natural and renewable resources, as well as expansion of existing energy developments thus reducing reliance on costly foreign fuel imports that burden its economy To improve energy efficiency in all sectors by 9% by 2030 <p>Energy Sector GG-NAP:</p> <ul style="list-style-type: none"> To decrease use of fossil fuels and decrease reliance on fossil fuel imports Enhance innovation and technical capacities in the energy sector. 	<p>National Energy Sector Strategy 2020-2030</p> <p>Energy Sector GG-NAP</p> <p>OECD clean energy?</p>
Transport Sector	<p>Long-Term National Transport Strategy:</p> <ul style="list-style-type: none"> MoT vision is to have a developed and sustainable transport sector, distinguished for competency, safety and environmental stability, enhancing the socio-economic development and making Jordan a regional hub for transport <p>Transport Sector GG-NAP:</p> <ul style="list-style-type: none"> Increase access to reliable, affordable, and safe public transport services for all, including women, youth, and rural communities; Promote the use of electric and hybrid vehicles through strengthened regulations and incentives; Promote non-motorized transport modes and provide necessary infrastructure Reduce GHG emissions (CO₂) from the transport sector; Promote the use of climate-resilient infrastructure in transport sector investment planning Increase public funding and private investment in the transport sector 	<p>Long-term National Transport Strategy</p> <p>Transport Sector GG-NAP</p>
Agriculture Sector	<p>National Agricultural Development Plan:</p> <ul style="list-style-type: none"> To digitize and restructuring the sector, and boost its productivity Increase the forest area by 10% by 2025 and expand pasture areas Increase the number of farmers using digital government-run agricultural services by 30% Increase the productivity of food and agricultural manufacturers by 18% by 2025 <p>Agriculture Sector GG-NAP:</p> <ul style="list-style-type: none"> Improve the skills and capacity of farmers, rural communities, youth and women to undertake sustainable agriculture; Increase use of resource efficient technology to reduce consumption and cost of water, energy, and waste management on farms and in agro-processing. Increase use of high-yield, drought and salinity-resistant plant varieties; Develop and implement policy and fiscal tools that encourage the take-up of adaptive techniques and technologies Introduce the concept of climate smart agriculture on farms; Increase carbon sequestration capacity of Jordan's land and forest. 	<p>National Agricultural Development Plan 2020-2025</p> <p>Agriculture Sector GG-NAP</p>
Industrial Sector	<p>JEGP:</p> <ul style="list-style-type: none"> Expanding the industrial manufacturing base, increasing available production capacity, enhancing the competitiveness of service sectors, providing an enabling business environment and creating job opportunities for Jordanians; all through building concrete and effective partnerships with the private sector. <p>Prioritised NDC mitigation actions for the industrial sector:</p> <ul style="list-style-type: none"> Low-carbon technology R&D 	<p>Jordan Economic Growth Plan (JEGP)</p> <p>Prioritised NDC Actions (Mitigation)</p>

	<ul style="list-style-type: none"> • Incentives for Low-carbon industries • Promote EE and RE 	
<p>Waste Sector</p>	<p>National Municipal Solid Waste Management Strategy</p> <ul style="list-style-type: none"> • Expansion of MSW recycling and separation schemes • Construction of mechanical and/or biological treatment facilities, and other sophisticated material recovery systems <p>Decentralized Wastewater Management Policy</p> <ul style="list-style-type: none"> • Establishing a decentralized wastewater management approach • Expand wastewater management by implementing the practice of recycling and reusing water beyond the existing conventional wastewater service system <p>Water Substitution and Re-Use Policy</p> <ul style="list-style-type: none"> • More efficient use of water resources through reusing treated wastewater in irrigation that enables freeing fresh water for municipal uses. <p>Waste Sector GG-NAP</p> <ul style="list-style-type: none"> • Reduce greenhouse gas emissions from landfills and dumpsites, particularly methane gas resulting from decomposed organic matter. • Improve the resilience of waste management and treatment infrastructure to climate-related disasters (such as floods). • Promote inclusive innovation in technology and processes to leverage waste-to-resource and waste-to-energy potential. • Increase the amount of waste diverted from landfills toward recycling and re-use 	<p>National Municipal Solid Waste Management Strategy 2015-2034</p> <p>Decentralized Wastewater Management Policy 2016</p> <p>Water Substitution and Re-Use Policy 2016</p> <p>Waste Sector GG-NAP</p>
<p>Water Sector</p>	<p>National Water Strategy</p> <ul style="list-style-type: none"> • The long-term goal is to achieve water security in the country • Proactive and preventive water adaptation approaches in protecting the limited water resources with emphasis in drinking water resources and upgrading drinking water quality management system and surveillance programs. • Preparedness and response for natural disasters such as severe weather, flooding and extreme temperatures, and external and internal conflicts <p>Water Sector GG-NAP</p> <ul style="list-style-type: none"> • Augmenting water supply for priority economic activities through decentralized infrastructure solutions, such as rain water harvesting (RWH) or reclaimed wastewater; • Introducing demand management measures such as efficiency improvements, loss reduction, water reallocation, and incentive structures to save/ conserve water; • Ensuring equitable, reliable, and affordable access to clean water and sanitation services for all; • Building resilience to climate-change related water challenges among vulnerable groups; • Increasing water-use efficiency across all sectors including agriculture, industries, and municipal sectors; • Reducing water losses and leakages in municipal water services and in conveyance systems to improve their efficiency in delivery; • Increasing the quantity of water and wastewater treated for further recycling and reuse. • Improve drought resilience by expanding decentralized supply and introducing demand management measures across sectors; • Improve flood resilience through flood risk management measures, through appropriate flood mitigation infrastructure and measures to respond effectively to floods; • Reducing GHG emissions in the water sector through use of RE and EE in water production and distribution systems. 	<p>National Water Strategy 2016-2025</p> <p>Water for Life 2008-2022</p> <p>Water Sector GG-NAP</p>

<p>Tourism</p>	<p>Tourism Sector GG-NAP:</p> <ul style="list-style-type: none"> • Increase public awareness about the value of natural resources and the environment through tourism sector activities; • Strengthen availability of data around environmental issues and mainstream the environment into the tourism sector’s development planning and management; • Reduce the negative impacts of the tourism sector on the natural environment (including biodiversity and at natural heritage sites); • Improve the attractiveness of tourism in Jordan to investors and tourists (foreign and domestic); • Increase the overall return on tourism sector investments by increasing the quantity and quality of tourism products and services, and enhance innovation in service provision • Develop green job opportunities in the tourism sector for all, especially women and youth; • Enhance the resilience of critical infrastructure in key tourism areas to natural hazards and climate-related risks; • Increase the resilience of the tourism sector 	<p>Tourism Sector GG-NAP</p>
<p>Economy</p>	<p>National Green Growth Plan (NGGP):</p> <ul style="list-style-type: none"> • A clear vision for Jordan as a country with an expanding and sustainable economy that creates jobs, income for its citizens, and is resilient to external shocks and instability in the region. A country of economic opportunity for everyone that provides decent work and living conditions based on an environmentally sustainable economic growth model <p>Jordan 2025: The most important goals that the vision seeks to achieve include:</p> <ul style="list-style-type: none"> • Economic growth, fiscal stability, reduction of financial waste and public debt to safe levels. • Foreign investment by enhancing and increasing business and investment competitiveness. • Development of economic sectors through market creativity and honing the tools and means of high-value-added export-oriented sectors. • Encouragement of small and medium-sized businesses. • Enhancement of the policies governing the labor market. 	<p>NGGP Jordan 2025 Jordan Economic Growth Plan Jordan Economic Monitor</p>
<p>Gender and Inclusivity</p>	<p>To identify and develop gender-sensitive strategies to respond to the environmental and humanitarian crises caused by climate change</p> <p>Key SDGs: SDG5 (Gender Equality)</p> <p>Key goals from Jordan 2025:</p> <ul style="list-style-type: none"> • An increment of women's participation in the labor market. • Giving necessary attention to people with special needs. <p>Gender mainstreaming is a key objective of the Local Climate Actions Plans of Deir Alla, Busaira and Ayoun municipalities</p>	<p>Jordan 2025 SDG Review Rural Women and Climate Change in Jordan Local CAPs</p>
<p>COVID-19 Response</p>	<p>The primary vision for Jordan’s COVID 19 response is to Build Back Better (BBB)</p>	<p>The Impact of the COVID-19 Pandemic on Enterprises in Jordan Jordan Food Security Update: Implications of COVID-19’</p>

11 Key Findings and Recommendations

From the review of strategies above (and in Appendix 1), the headline conclusions for Jordan's LTS Vision are as follows:

There are many commonalities between the visions, objectives, and language used in the strategies which promotes integration: suggestions for key themes were presented above and are further detailed below.

The main priorities for the country, from visions and goals reviewed, include sustainable inclusive development, resilience to climate change impacts (greater importance nationally than mitigation), sustainable economic growth, increased self-sufficiency, enhancement of opportunities for women, protection of natural resources, and ensuring fairness and equality of opportunities for all. Protection of history and heritage, clean and green urban space, and ambitious mitigation goals were additional themes of sub-national visions. Building back better from the COVID-19 pandemic is also an additional goal, driven by current pressures.

Several strategies are undergoing an update at present and so it is likely that the content and analysis will change and will need to be revisited. These include

- Vision 2025 – via the Executive Development Programme
- Jordan's updated NDC
- The 4th National Communication and 2nd Biennial Update Report
- The Climate Change Policy
- COVID-19 recovery planning work

There are no visions in current strategies that extend beyond 2030 and there are no quantified targets that extend beyond 2030, so the longer-term nature of the LTS and vision presents a new challenge and opportunity for Jordan

Sub-national plans have significantly more ambitious mitigation goals than national plans (consistently 40% reduction in GHG emission from ~2015 baseline by 2030) compared to the NDC target of 14% by 2030.

Based on this review, the themes identified have been further expanded on and explained in the next section.

Following this, a framework for Jordan's vision is presented, before a summary of some of the main opportunities, challenges and recommendations emerging from the review process and accompanying stakeholder consultations.

11.1 Key themes for Jordan's vision

These themes presented in the conclusions of the previous chapter are recommended to be considered as a guide for the development of the vision of Jordan's LTS. They intend to capture the key themes of resilience, low carbon growth, sustainability, inclusivity and are described in more detail below:

1. Climate resilient, low carbon, healthy, inclusive, and sustainable communities and institutions, that ensure opportunities are evenly distributed

A large number of strategies and documents use language including 'resilient', 'sustainable' and identify the need for fairness. These words often make up the main vision statement of documents and are therefore priority concepts. For example, references include:

- Climate Change Policy: "... healthy, sustainable, resilient communities..." and importantly, "an emphasis on adaptation as the imperative track."
- Draft NAP: "sustainable and climate-resilient development"
- Vision 2025: "Prosperous and Resilient Jordan"
- SDG review: "more resilient, prosperous and inclusive economy going forward"

The word 'climate' has been incorporated here to emphasise the importance of adaptation and resilience to Jordan.

The even distribution of opportunities is picked up in, e.g. Vision 2025: "...based on providing opportunities for all" as well as in sector visions, such as the Jordan National Water Strategy which notes the need to manage water "for all Jordanians". Sub-national plans also emphasise the importance of all communities, such as the Greater Irbid Municipality SE-CAP: "improving the quality of life of all community's groups".

Reference to "low carbon" is important to also include within the vision given the need for a mitigation goal. Ideally this would be defined in the vision text. Current reference can be found, for example, in the Climate Change Policy ("a low carbon but growing economy") and throughout sector strategies (e.g. "low-carbon transport").

This first theme could be considered an 'overarching' theme or form the main vision statement as it captures many elements of the other themes to follow.

2. A country with an environmentally sustainable economic growth model resilient to external shocks and instability – pro-actively delivering prosperity, improved quality of life and jobs for all citizens, particularly youth, women and vulnerable groups

Whilst Jordan's Vision 2025 does not specifically include "economy" in the text, the vision is premised around a prosperous and growing economy. In particular, the sentiment is captured in the Vision 2025 objectives, which include reference to, for instance, the development of economic sectors, encouragement of SMEs as engines of growth, building a local labour force, particularly through youth and women, and increase competitiveness and high value added export sectors. These objectives are mirrored across other policies and strategies, for example the SDG review notes the importance of "ensuring a more resilient, prosperous and inclusive economy going forward", the NGGP "an expanding and sustainable economy" and the Climate Change Policy "a low carbon but growing economy".

Several sector strategies highlight the importance of job creation, such as the National Agricultural Development Strategy, and the NGGP references a "sustainable economy that creates jobs". The NGGP also notes the importance of being "resilient to external shocks and instability in the region" which given the current COVID-19 pandemic and past crises, has significance.

Lastly, Jordan's need to recover from the COVID-19 pandemic makes this theme important to incorporate as part of the 'build back better' agenda. 'Building Back Better' is a phrase that is becoming increasingly important in responding to the COVID-19 pandemic but has not been explicitly included in the theme here regarding external shocks and instability – this is because the vision needs to look to 2050 and COVID-19 recovery is, hopefully, a shorter term need. However, the sentiment of this, and any potential future shocks, is intended to be captured through reference to shocks.

The word "proactive" was used in the vision for Jordan's current climate change policy ("achieve a pro-active, climate risk-resilient Jordan") and reflecting this, also in the draft NAP ("through its NAP process, Jordan intends to achieve a pro-active, climate risk-resilient nation"). "Proactive" was also a sectoral theme that emerged, for example, in the Water Strategy: "Proactive and preventive water adaptation approaches in protecting the limited water resources with emphasis in drinking water resources and upgrading drinking water quality management system and surveillance programs." Use of this word would emphasise Jordan's desire to shape its future rather than be reactive, which supports the role of the LTS as a counterbalance to crisis response, short term decision-making.

Lastly, reference to youth, women, vulnerable groups, and improved quality of life, prosperity and jobs is an overarching theme for Jordan – this is detailed further below and is deliberately duplicated as in strategies and documents, it is continually integrated and repeated.

3. A society that is inclusive, considers youth and gender, delivers improved quality of life for vulnerable groups, and ensures no one is left behind

A consistent theme in the strategy documents was inclusiveness, gender sensitivity and ensuring equal opportunities. This should be considered a core component for the vision to address. Examples include:

- Vision 2025 – specifically includes gender-related goals such as “Increase women's participation in the labour market through specific programs”
- Climate Change policy sub-objective – “Ensure that the interests of vulnerable groups, with emphasis on the poor, youth and gender are adequately addressed in mitigation and adaptation policies and strategies and integrate climate change mitigation and adaptation aspects into national sustainable development and green growth policies, strategies, and legal framework taking into account gender mainstreaming and the role and needs of youth and elderly people”.
- Draft NAP – “consideration for gender aspects and the needs of the most vulnerable groups.”
- Report ‘Rural women and climate change in Jordan’ – “To identify and develop gender-sensitive strategies to respond to the environmental and humanitarian crises caused by climate change”
- National Transport Strategy – a “Mobility is fully sustainable when it also addresses the impacts of transport activities in terms of social exclusion-related, economic and social cohesion, and demographic changes.”

Sub-national strategies also reflect this theme, including

- Ayoun Municipality Local Climate Action Plan – “to promote equality and justice (gender mainstreaming)”
- Greater Irbid Municipality SE-CAP: “improving the quality of life of all community’s groups”.

The SDG review identified the importance of gender and inclusivity as a foundation of strategies in the country, and stakeholders frequently reference “Jordan is committed to the 2030 Agenda and to leaving no one behind”.

Lastly, the Jordan Response Plan also shows Jordan’s enduring commitment to continue to build an integrated multi-year framework to most effectively respond to Syria crisis in a transparent, collaborative and sustainable manner in line with the Global Compact on Refugees and the 2030 Agenda, which can also be reflected under this theme.

4. Sustainable, self-sufficient and efficient energy and transport sectors, meeting needs through high levels of deployment of local renewables and low carbon technologies

Given the importance of clean energy and efficiency to achieving long term mitigation goals, this theme has been specifically identified and occurs frequently in strategies, particularly sectoral:

- The Energy Strategy is underpinned by the goals of increased self-sufficiency of energy (growing local energy resources, for example through renewable energy): “diversify energy resources and increase the contribution of local energy resources to the total energy mix”
- The transport strategy aims at “increasing the modal share of low-carbon transport modes and improving energy efficiency”.
- The Jordan National Water Strategy also aims at “efficient and productive use of water including cost recovery... efficient water management... Innovative and efficient technologies, infrastructure and partnerships”.

The Climate Change Policy also emphasises this theme, with the first 3 mitigation objectives focussed on energy:

- “Strengthen the promotion of renewable energy and energy efficiency in Jordan, which will have a large impact on reduction of GHG emissions in the country;
- Complete the policy and legal framework for renewable energy and energy efficiency and strengthen the development, implementation and enforcement of existing regulation, e.g. green buildings codes;

- Develop and adopt in the transport sector the strategies promoting energy efficiency and low carbon transportation modes, and facilitate transfer of low carbon transport technologies”.

Lastly, sub-national plans also make specific reference to sustainable energy, for instance Ayoun Municipality Local Climate Action Plan: “efficient resource management and a model for sustainable development (solar energy, rainwater)” and Busaira Municipality Local Climate Action Plan “enhancing resource efficiency”.

5. Sustainably managed and resilient natural and agricultural resources, and thriving and productive ecosystems, to enhance climate resilience

The Climate Change policy aims for “sustainable, resilient communities, sustainable water and agricultural resources, and thriving and productive ecosystems in the path towards sustainable development” and further goes on to define as the objective, “adaptation as the imperative track”. As an objective, it specifically includes:

- “Further increase the scientific knowledge of climate change vulnerability and impact on water, agriculture/food production, health, biodiversity, desertification and other relevant sectors, with water and agriculture as the key sectors. This will include the link between climate change adaptation and disaster risk”.

The Draft NAP also includes in its objective “increased resilience of its communities and institutions, natural ecosystems, water and agricultural resources in the path towards sustainable and climate-resilient development”.

Agriculture and Water are the two most important sectors for adaptation and are considered major economic sectors, and ecosystems are known to provide significant benefits from a climate perspective, specific reference to these is recommended.

Further, Greater Irbid Municipality SE-CAP notes the importance of agriculture as a sector for future investment and preservation and Ayoun Municipality Local Climate Action Plan references efficient resource management including rainwater.

6. A country with a focus on participatory policy making, fiscal sustainability and strong institutions, with decision-making based equally on social, economic and environmental goals

This theme has been derived predominantly from Jordan Vision 2025, which includes in the vision “increasing participatory policy making, achieving fiscal sustainability and strengthening institutions”. It also references an “integrated economic and social framework” to govern policy. However, the sentiment of this theme is mirrored in a number of strategies, including:

- The climate change policy objective “Provide a ground to secure sufficient financial support, and strengthen institutional and human resources capacities to achieve the objectives advanced herewith, including providing access to regional and international financing resources and capacity building initiatives and programs”.
- Transport Strategy pillar “Make the best of private participation”.
- The National Climate Change Health Adaptation Strategy and Action Plan of Jordan further guiding principle, “enable dialogue between decision-makers, researchers, businesses, NGOs, local communities, etc to implement appropriate and accepted actions...”

As an LTS theme, this may be less relevant given it is focussed predominantly on modes of delivery and processes that underpin the LTS, and Jordan may decide this is an objective to ensure the LTS covers through its governance arrangements rather than as a specific theme. Nonetheless, it was mentioned in documents.

7. Liveable and sustainable towns and cities that are clean, modern, safe, environmentally-conscious, and work efficiently, to promote their heritage and preserve resources for future generations

Lastly, it is important to reflect the sub-national plans and strategies include in the review, particularly the towns and cities, and the importance of the “urban” sector within the Draft NAP. Whilst

the sub-national visions overlap with many of the above themes, there are some specific references that are unique, in particular around preserving the heritage and ensuring clean, safe and modern places and physical characteristics. For example:

- Amman Climate Plan: “a sustainable, green and liveable city that works efficiently to preserve its resources for future generations”.
- Deir Alla Municipality Local Climate Action Plan: a pioneering, organized, clean, soulful and eco-friendly city ... emblematic of sustainable development that cherishes its heritage and ingenuity”...
- Aqaba Special Economic Zone Authority SE-CAP: “a prosperous city by fostering social harmony, safeguarding the natural beauty of city”...
- Greater Irbid Municipality SE-CAP: “economically developed, sustained and culturally preserved”.

11.2 Summary vision

The above themes have been consolidated into four principles and one proposed vision statement for Jordan’s LTS – shown in The above themes have been consolidated into four principles and one proposed vision statement for Jordan’s LTS – shown in Figure 4-2 below. Note that this is an example only and is in way intended to be prescriptive:

- Leave no one behind and ensure a high quality of life for all
- High resilience to climate impacts and future shocks
- Low carbon, sustainable and efficient
- Sustainable economic growth and prosperity, and opportunities for all

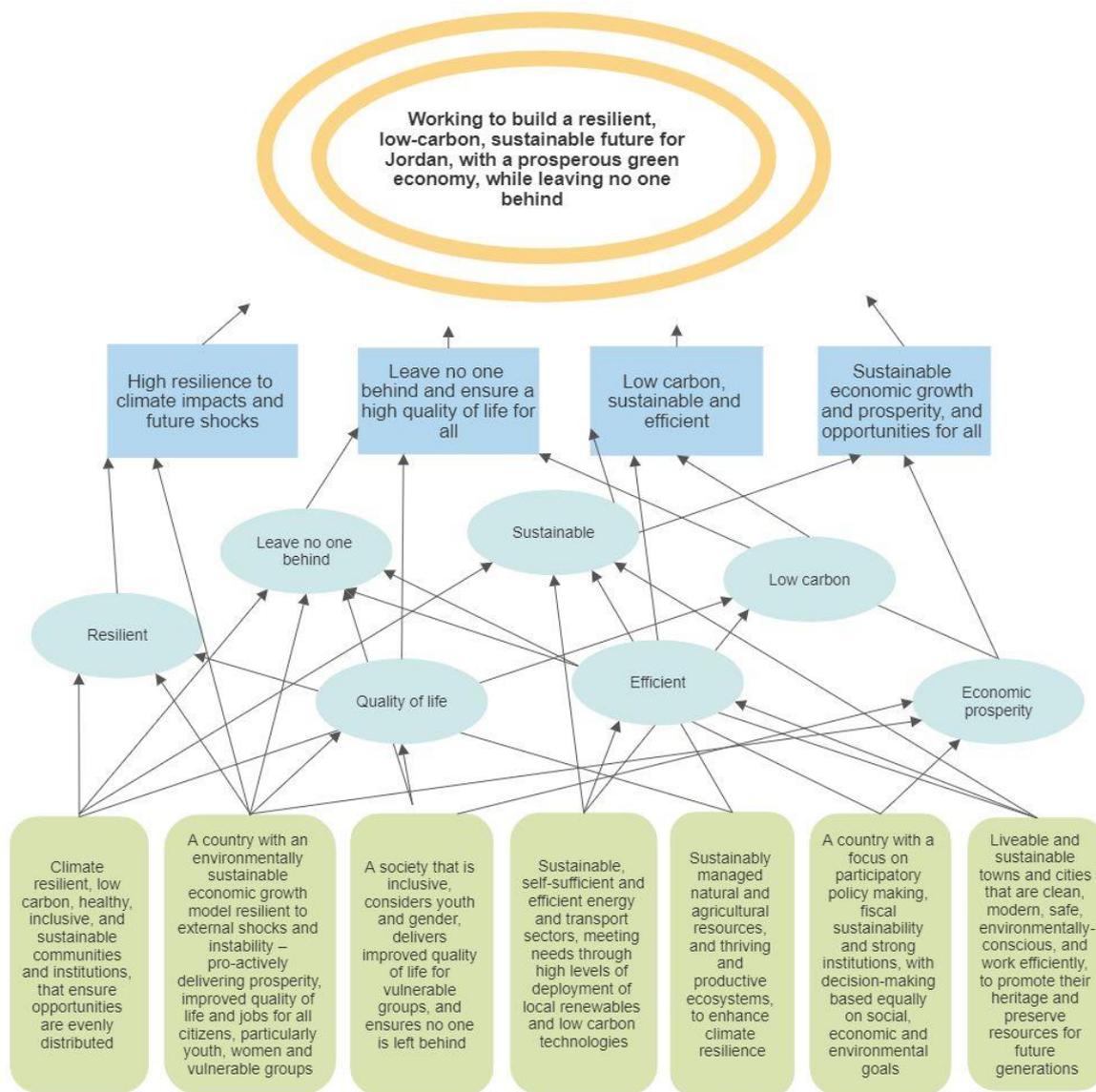


Figure 4-2 below.

- Leave no one behind and ensure a high quality of life for all
- High resilience to climate impacts and future shocks
- Low carbon, sustainable and efficient
- Sustainable economic growth and prosperity, and opportunities for all

Working to build a resilient, low-carbon, sustainable future for Jordan, with a prosperous green economy, while leaving no one behind

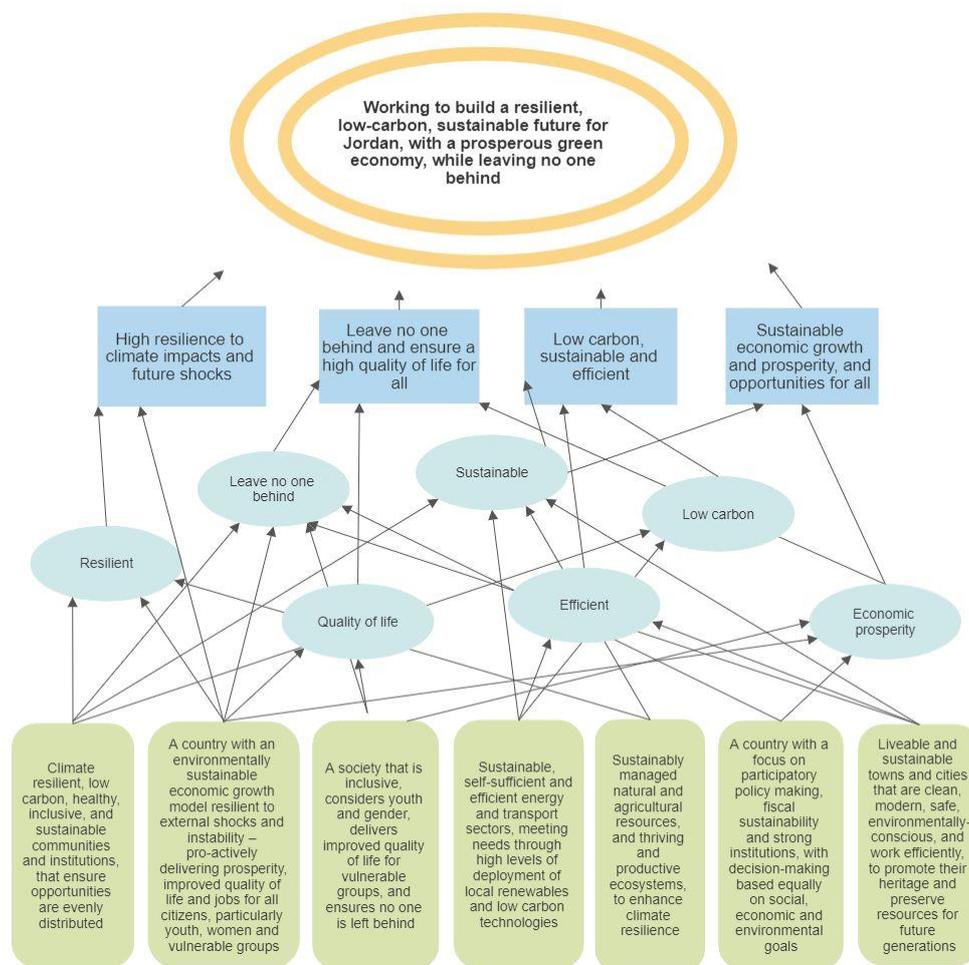


Figure 9: Jordan’s potential long-term strategy vision
 Source: Developed by Ricardo Energy and Environment

11.3 Structure of the Vision

In developing the LTS, Jordan can use the themes above as a basis for consultation and discussion of priorities with stakeholders and citizens, and the framing of sector and cross-cutting strategies.

Jordan may additionally wish to strengthen its mitigation commitment in the vision itself, consistent with international LTS submissions, and include a specific reference to a 2050 mitigation goal or net zero emissions.

Following the framework of the vision proposed in section 9.5, review of international LTSs and Jordan’s strategies, the following structure and content for the vision is recommended:

Vision statement component	Description and Recommendations
Societal benefits and development goals	Jordan’s vision needs to ensure it clearly connects with current and long-term development goals and challenges in the country, and is framed in inclusive, country-wide terms. It should ensure it speaks to all parts of society and regions of the country, and integrates key concepts such as leaving no one behind through justice, fairness and equality . This is important to ensure that the LTS is viewed as a strategy for all, and frames climate responses as something positive, bringing benefits and tackling challenges.

Long-term focus	<p>Jordan’s vision needs to recognise the timeframe to which the strategy relates, and the strategy needs to cover the entire period. The UNFCCC secretariat specifically states that countries should submit “<i>mid-century, long-term low greenhouse gas emission development strategies</i>”. All the examples above and the supporting literature widely support 2050 as the appropriate ‘long-term’ date.</p> <p>Jordan must therefore agree and include a vision that spans the period to 2050. This can also include reference to interim dates.</p>
Detail adaptation and/or climate resilience visions/goals	<p>The LTS vision should ensure it is “mindful of Article 2 taking into account [countries] common but differentiated responsibilities and respective capabilities”. If countries such as Jordan do not address adaptation in development planning. Adaptation is an important issue for Jordan (“the imperative track” – Climate Change Policy) and should therefore be a priority to integrate into the LTS vision. This also will allow for consideration of synergies between mitigation and adaptation. The LTS vision can go further and be explicit about the balance between mitigation, adaptation and other development priorities, clearly laying out the approach the country wishes to take on climate change, recognising country circumstances. For example, referencing adaptation as “the imperative track”.</p> <p>Jordan can also make clear the country’s vulnerability to climate change and priority to adapt in the vision, with mitigation framed as a co-benefit of adaptation and sustainable development for example. It can outline the most important adaptation options that address the most important climate vulnerabilities and potential impacts and risks, and quantify likely reductions in greenhouse gas emissions (see below) insofar as they are compatible with these options.</p>
Alignment with recent and current strategies	<p>The vision statement should reference how it aligns with the visions, objectives and goals of recent and current strategies that are of national importance to Jordan.</p> <p>Jordan should state whether, for example:</p> <ul style="list-style-type: none"> • The LTS builds upon or links to Jordan’s NDC • The LTS builds on “Jordan 2025” (or updates to this) • The LTS provides synergies with other development goals and policy areas (e.g. gender) which could be explicitly referenced – for example referencing the SDGs
International context	<p>The vision statement should contextualise the international importance of the strategy to the UNFCCC. Not many countries have yet put forward an LTS, so the vision should explicitly reference the LTS’ position as a report for the UNFCCC for clarity. Additional information on Jordan’s fulfilment of reporting obligations under the UNFCCC can also be included if desired.</p> <p>Jordan should include a sentence to acknowledge that the LTS is submitted consistent with Article 4, paragraph 19 of the Paris Agreement.</p>
Quantified target	<p>As shown in the international review, countries so far have predominantly committed to a net zero or carbon neutrality goal by 2050. Although there is wide recognition that the LTS should focus on national priorities, and some countries are taking an ‘adaptation first’ approach, an LTS is nonetheless intended to provide details of the country’s low greenhouse gas emission development. Some countries such as South Africa alternatively detail the trajectory (e.g. target peak year) to be followed.</p> <p>Whilst taking into account Jordan’s wish to prioritise adaptation, the LTS should also state a 2050 mitigation goal and ideally, the scope, such as which GHGs and sectors (e.g. economy wide) the target will cover. For example, the (currently proposed) commitment to a carbon neutrality goal in the updated Climate Change Policy should be referenced.</p>
Interim targets	<p>The LTS vision can also note interim targets (e.g. reduction of 40% by 2030, reflecting sub-national commitments. Or targets for every 5-10 years etc.) that will</p>

keep the country on track for the 2050 target. This will also be important for alignment with, for example, the NDC and future updates to this.

Jordan can consider referencing its NDC as an interim target, or the sub-national commitments of 40% by 2030, and updated Climate Change Policy if this contains interim targets. However, the current NDC target is likely to not be ambitious enough to align with a mitigation pathway to deliver a net zero 2050 goal, and this will need to be addressed through stakeholder consultation processes, modelling and analysis of mitigation potential etc. Given that Jordan is likely to prioritise adaptation however, interim mitigation targets may be less relevant to specify within the LTS vision.

11.4 Suggested vision statement

It is important to remember that the Vision Statement can be accompanied by a Foreword and Executive Summary within the opening introduction of the Jordan LTS. These additional sections can go into other areas of detail to the Vision, such as any sectoral goals, recent historic landscape of action on climate change in Jordan, reasons behind Jordan's development of the LTS, and a summary of the LTS development process.

In addition, **including a memorable phrase or saying in Arabic in the Foreword or Executive Summary can help with making the strategy more memorable to the reader, more approachable to the layperson, and unify the report around a simple concept:**

Working to build a resilient, low-carbon, sustainable future for Jordan, with a prosperous green economy, while leaving no one behind

العمل معاً لبناء مستقبل مستدام، منخفض الكربون، ومرن قادر على الصمود في ظل التغيرات المناخية مع ضمان اقتصاد مزدهر أخضر لا يستثنى أحداً

Based on the above thematic structure above, and the themes of the visions identified, it is recommended that the Vision Statement be concise, with a suggested length of between 350 to 650 words. This would result in between 5 to 7 paragraphs, as suggested but not limited to what is contained within the Draft Vision below.

The wording of the Vision Statement is designed to convey an image of what the final Vision Statement might look like, and serves as a draft version with which to edit:

Paragraph 1:

Working to build a resilient, low-carbon, sustainable future for Jordan, with a prosperous green economy, while leaving no one behind. Our pathway to 2050 is focussed on the need to adapt Jordan to the increasing risks from climate change whilst maximising the benefits of a transition to a cleaner and low carbon future. Throughout this transition, sustainable and inclusive development is central, including enhancing women's empowerment, opportunities for young people, supporting vulnerable communities, eradicating poverty, and promoting equality, justice and fairness [insert further sentence(s) as needed].

Paragraph 2:

Adaptation to climate change is imperative for Jordan. Our long-term adaptation goals are to build sustainable, climate-resilient communities, ensure sustainable water and agricultural resources, and thriving and productive ecosystems. This strategy will build Jordan's long-term resilience to the risks of climate change ... [insert further sentence(s) as needed, referring to the long-term risks associated with climate change in Jordan, what impacts this could lead to, and how the international importance of adaptation goals within country long-term strategies].

Paragraph 3:

Jordan also strives for decarbonisation whilst adapting to climate impacts and will aim to maximise the opportunities that decarbonisation will bring, including energy security and efficiency, new technologies, job creation, cleaner and healthier environments, and new economic opportunities. We aim to ensure that Jordan transitions to a lower carbon economy by mid-century and achieves net zero emissions before the end of the 21st Century. Jordan's long-term mitigation goals... [insert further sentence(s) as needed, referring to the long-term low-carbon GHG emissions pathway for Jordan]

Paragraph 4:

Jordan's LTS was developed in line with Article 4 of the Paris Agreement, whereby Parties to the United Nations Framework Convention on Climate Change (UNFCCC) "should strive to formulate and communicate long-term low greenhouse gas emission development strategies, mindful of Article 2 taking into account their common but differentiated responsibilities and respective capabilities, in the light of different national circumstances". In addition, the LTS also answers the urgent call issued by

the recent Intergovernmental Panel on Climate Change (IPCC) Global Warming of 1.5°C, an IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global GHG emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. (insert further sentence(s) as needed)

Paragraph 5:

Jordan's LTS is designed to be a "living document", that serves to guide the country's long-term development whilst remaining adjustable to the national context. It aims to support the strengthening of institutional and human resources and capacities to achieve the objectives, engage civil society and provide a common vision for all. It also furthers the visions of other strategies of national significance, such as Jordan Vision 2025 (2013), Jordan's Climate Change Policy (2013-2020), National Adaptation Plan (draft), National Green Growth Plan, Jordan's first Nationally Determined Contribution (NDC) (2015), local government climate action plans and national sectoral strategies... [insert further sentence(s) as needed]

11.5 How should Jordan develop its vision: process

As outlined in section 9.5, several key components should form Jordan’s vision. These are summarised in the diagram below.

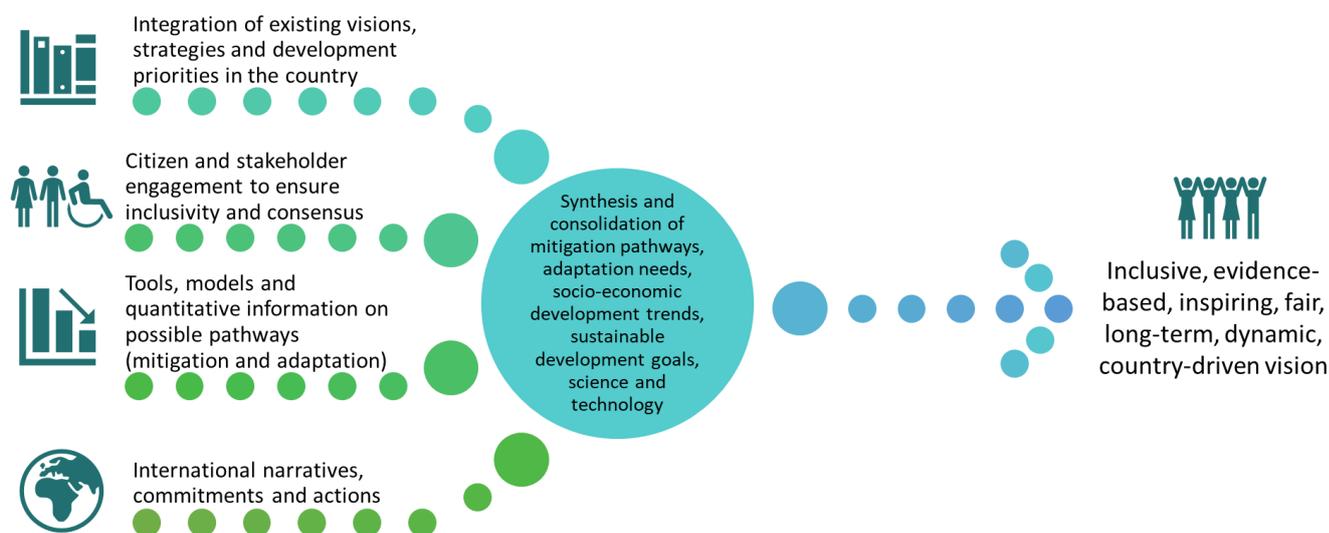


Figure 10: Creating the country vision

Source: Developed by Ricardo Energy and Environment

It is recommended that Jordan undertake the following steps to define the LTS vision, drawing on the above. Note that these are likely to need to be iterative:

- Review existing visions, strategies and development priorities in the country:** Utilising the information contained in this document, the draft vision themes and through further review and consolidation of sectoral and country-level strategies (particularly any subsequent updates), define the existing overarching goals and objectives for the country and the *principles for the vision*. For example, on fairness and justice, sustainable development, gender, youth and equality etc. During the process of refining the vision or in subsequent iterations, there will need to be both integration of the vision into relevant strategies (including at sectoral level) and consideration of any updates of key strategies (e.g. the Executive Development Program of Jordan Vision 2025). The themes above can be used as a starting point for this and as the basis for consultation.

e.g. National Green Growth Plan (NGGP): A clear vision for Jordan as a country with an expanding and sustainable economy that creates jobs, income for its citizens, and is resilient to external shocks and instability in the region. A country of economic opportunity for everyone that provides decent work and living conditions based on an environmentally sustainable economic growth model

e.g. Jordan 2025: To identify and develop gender-sensitive strategies to respond to the environmental and humanitarian crises caused by climate change

e.g. Key SDGs: SDG5 (Gender Equality)

- **Agreement on the scientific consensus regarding international commitments and actions – defining a mitigation commitment:** The scientific consensus on the need for global deep decarbonisation is clear. Jordan should consider its level of commitment for 2050 and consider adopting, at least in principle, a goal of carbon neutrality / net zero emissions. This will need to be tested with stakeholders, particularly Ministers and political groups, and key stakeholders, in order to sensitise and build engagement. Key to this will be building capacity on climate issues and articulating the benefits of an LTS and adoption of such goals.

e.g. INDC target: 14% GHG reduction (1.5% unconditional / 12.5% conditional)

Amman Climate Plan: 99.5% reduction by 2050

Climate Change Policy (update) is expected to propose net zero by 2050

Sub-national CAPs/SE-CAPs target 40% reductions in emissions by 2030

- **Agreement on climate adaptation and sustainable development priorities:** Alongside this, defining the adaptation priorities and needs, and sustainable development objectives, should also be undertaken to ensure the vision is inclusive of all priorities. These should also be tested with stakeholders, particularly Ministers and political groups. Key to both will be *building the linkages and co-benefits between climate adaptation, development and mitigation* to create a compelling vision.

e.g. NAP: To build the adaptive capacity of communities and institutions in Jordan, with consideration for gender and addressing the needs of vulnerable groups, to increase the resilience of natural ecosystems and water as well as agricultural resources to climate change, and to optimize mitigation opportunities

- **Citizen and stakeholder engagement to ensure inclusivity and consensus:** Seeking citizen and stakeholder input to shape the vision can be highly effective and can come at a number of different stages in the process (and are not mutually exclusive). This might include gathering initial ideas on priorities and goals across the country to define the principles of the vision; seeking feedback on specific elements of the vision (or the pathways to achieve them), including in different sectors or on different technology options; building capacity on climate through consultation on options to create buy-in and increase awareness; and testing final vision statements with stakeholder groups. Again, the themes above could provide a starting point for this consultation.
- **Defining scenario and pathways:** Lastly, there are important technical steps required in the finalisation of the vision through the development and refinement of the pathways to achieve the goal. There might be multiple pathways based on different technology options and assumptions, and these should be tested with stakeholders. *[note that this will be covered further in the separate report on modelling].*

11.6 Key questions and opportunities for Jordan's LTS vision

A number of key questions and opportunities for Jordan in creating the LTS vision have been identified through the review of documents and during stakeholder consultations. These are summarised below by theme, with recommendations as appropriate, and should be considered by the LTS development team in determining the country vision and the overall LTS approach:

How can the LTS help Jordan enhance climate reporting and ambition?

- Jordan's current climate mitigation targets fall short of the commitment levels needed to be compatible with Paris Agreement goals. For example, the new Energy Strategy goal of a 10% reduction on BAU emissions on 2030 would still see emissions increasing. The LTS vision therefore both **offers an opportunity to raise ambition, but will pose challenges in securing commitment to a target that is significantly more ambitious than previously committed to.** However, the timeframe of the LTS offers some flexibility to make such commitments, on the assumption of global shifts in technologies and society to achieve this as a collective.

- A Net Zero 2050 goal is possible to propose for Jordan, but the LTS development process will need to **carefully consider how this is managed and the country needs for such a commitment**. This includes extensive awareness raising, building the knowledge and buy-in of decision-makers, addressing data challenges to back up a commitment, and finance. It will be important to frame the potential vs planning (what can Jordan achieve now, where should Jordan be aiming for and how to frame this in long term planning) and the tools needed to set this goal. A 'net zero' goal will also need to be followed through in other policies and commitments / reports (if adopted) and mainstreamed into these through actions and indicators. In addition, sub-national government have already outlined more ambitious goals for the medium term (40% on 2015 levels by 2030) which may provide a good basis for commitment to increased ambition, particularly with citizens.
- The development of the LTS will not happen in time to inform the updated NDC in 2021, however, it is recommended that in future the Ministry of Environment proactively steers **climate policy planning processes to align the NDC revisions with updates to the country's LTS**. Likewise, the Jordan NAP is still in draft, and therefore may offer an opportunity for alignment, but future updates should ensure coordination with the LTS.

Can an LTS help improve long term planning and crisis response?

- A planning process to 2050 is new for Jordan, as for many countries, and offers an opportunity to better support shorter term policies and decision-making, for example in response to crises, through the ability to assess decisions against a longer-term pathway. Undertaking a **longer-term planning process and vision-setting in an inclusive and participatory way, will help ensure that decisions made in the near term are consistent with those long term objectives**, ensure updates to strategies and policies are undertaken in a harmonised way, provide the opportunity for new voices to be heard and citizens to shape their country's recovery, and provide some longer term policy certainty and an **international signal of decarbonisation intent**. Furthermore, setting a long-term vision and creating a strategy to achieve this, charting a pathway and identifying key milestones, will help to ensure that future short-term crisis responses and recovery policies can be aligned to a longer-term pathway.
- Whilst optimism and ambition are important however, for Jordan, basing planning on 'worst case scenarios' about what is possible might help to ensure the LTS provides a more realistic pathway to support better decision-making to short term crises. Differentiating short and long term, and key assumptions and support needs, will be important.

Can an LTS support an integrated approach?

- Mainstreaming development priorities into the LTS vision (e.g. jobs, gender and inclusivity, SDGs) provides an opportunity to 'bring everything together' in one overarching country strategy, and also **make clear the benefits that can be realised through climate compatible development**. This may help to better market ambitious climate goals to stakeholders and interest groups, if supported by awareness raising and capacity building. This should be a priority in creating the vision, through ensuring parallel capacity building and awareness raising on the wider impacts of climate.
- **Integrating mitigation and adaptation goals in one strategy** and identifying mitigation actions that have adaptation benefits (and vice versa) helps to ensure that win-wins can be maximised and trade-offs limited and so this should be made explicit in the vision.

How can the LTS link to green growth and climate finance?

- Jordan has undertaken, and still is, much work and planning around climate finance and green growth, including activities related to Article 6 mechanisms and on 'Green Growth'. **Linking the details of the LTS vision to Article 6 activities** would provide a good opportunity to show how the LTS vision might support or generate investment and create projects with positive impacts.
- If the LTS sets an ambitious vision and pathway, it **provides a 'direction of travel' for investors** to make better and more targeted financing decisions, and ensure that funds are

not diverted into projects or activities that result in stranded assets or lock-in. This is a message that should be emphasised, particularly where pathways might indicate technologies or solutions with perceived or actual high costs.

- **The GG-NAPs have perceived importance and weight, are well integrated and well-known** in Jordan. They generate or drive income and investment, and the ‘Green Economy’ has become a key concept in Jordan. Stakeholders are more familiar and more interested in this than climate-specific activities such as the NDC, which are seen as distant and government focussed. **The LTS and its vision could have more momentum and meaning if it speaks to people and their needs and concerns, and links to green growth.**
- Safeguarding key areas of the economy will also be important, particularly from climate impacts. these include the Tourism sector (extreme events preparedness) and Agriculture produce (extreme events frost, flash floods and drought, extended heat waves).

How can the LTS support Covid-19 recovery?

- The Covid-19 pandemic has had unprecedented impacts across the world, and Jordan is putting in place recovery plans to deal with the aftermath. The Covid-19 pandemic has also been widely acknowledged as an opportunity to initiate a shift, and ‘Build Back Better’ in ways that are more sustainable, resilient and lower carbon. **The economic recovery strategies and wider Covid-19 recovery plans should be a critical input to the LTS vision and process, and the LTS process and vision should equally inform these.**
- At present, Covid-recovery planning is in the early stages (as the pandemic is still ongoing) so recommendations on specific interventions at this point are not possible. But **the vision of the LTS can provide an opportunity to support recovery if undertaken in parallel.**
- Identifying ‘green’ technologies, projects and investments that not only **shift the pathway but deliver recovery objectives** will provide win-wins. The Ministry of Environment and LTS development team should therefore work closely with those leading Covid-recovery efforts, and the Ministry of Environment should also seek to inform and input to these at the earliest opportunity to ensure recovery plans are not supporting unsustainable actions and lock-in to pathways that are not compatible with lower carbon emissions and greater climate resilience.

How should the LTS involve stakeholders and citizens?

- The LTS vision offers a unique opportunity to engage with citizens, especially in light of the Covid-19 recovery, to shape a ‘future Jordan’. **Ensuring that climate change and the LTS/LTS vision is relatable to people** and not just about numbers will be key. There are opportunities to build knowledge and awareness alongside seeking views and testing options, if innovative communication methods are used, including interactive tools, apps, social media, mainstream media, events, citizen groups, and via existing local governments and networks.
- **Integrating communities via local governments** may be an effective way to reach people and ensure the LTS and its vision is seen as a strategy for all and not just for those in Amman. This has the added benefit of potentially **enhancing “vertical integration”** of climate responses between levels of government, as well as opportunities to speak more directly to citizens and make the vision more applicable to local areas.
- For stakeholder engagement and awareness raising on the LTS and vision, **learning lessons from the development, mainstreaming and promotion of the GG-NAPs** will be useful for successful buy-in. Creating awareness of people to prioritise climate change – communicating, building knowledge, sharing positive outcomes and benefits – will be key to buy-in to the vision and long-term goal.

Can the LTS enhance climate data and knowledge?

- The **LTS vision and target must be supported by quantitative modelling** of pathways and options. Jordan has experience of modelling future emissions (BAU and mitigation pathways) but this will need to be extended to 2050. Previous modelling has flagged data limitations and uncertainties, especially over the longer term (economic growth rates etc) and these uncertainties will need to be reconciled. **Data gaps and challenges will need to be systematically addressed.**

- The NC4 update, starting imminently, will be undertaking updated projections (likely using LEAP) and should **consider how the LTS modelling can be aligned**. The NDC actions – when finalised – need to be considered in the LTS vision and built upon to hit a net zero goal (if adopted).
- Jordan should also ensure that any gaps or limitations in data and modelling are identified and can be flagged to work towards in the next update. Ideally these updates would be **aligned to the update cycle** for other key strategies and climate submissions, for instance, the 5-year NDC updates and the Jordan Vision 2025 updates.
- Ensuring that the modelling and analysis is undertaken as much as possible within the government, or incorporates rigorous training/knowledge transfer and plans **to institutionalise modelling and data knowledge** will be essential to ensure the LTS is a 'living' document and can be regularly updated as knowledge, science and technology changes.

11.7 Additional activities needed beyond this roadmap

This work has involved a comprehensive assessment of Jordan's existing visions, strategies and policies. However, there are a number of activities underway in parallel in the country, which have not been possible to incorporate at this point. These are summarised in the table below. The LTS development process should ensure that it checks the status, and incorporates/builds on these as the work commences. Of particular importance is the Executive Development Programme (Vision 2025), and the updated Climate Change Policy.

Table 9: Forthcoming activities and documents important for review and inclusion in the LTS that have not been possible in this project

Document / strategy / activity to additionally include	Relevance	Expected availability
BUR2	The BUR2 will update the mitigation projections and modelling for Jordan and also update the GHG inventory, so will be the most recent baseline	Q1 2022 estimated
Covid-19 recovery plans / Economic recovery plan (World Bank)	This will present the opportunities and strategy for economic recovery from COVID-19 and 'Build Back Better'. It is hoped this will reflect a 'green recovery' but the plans and vision of this will be important to factor into the LTS, at least in the short term	Unclear
Updated climate change policy (UNDP)	This policy is critical to include as it is re-setting a long-term mitigation commitment and direction for the country and will provide strategic guidance in, potentially the longer term, which will directly inform the LTS development	Q1 2021 estimated
NAP (final published)	The NAP draft has been included in this review but is not yet formally published. Any changes will need to be considered in the LTS	TBC
Updated NDC	The updated NDC will put forward prioritized actions and the short term (2030) mitigation target. This should represent an 'interim target' for the LTS and ideally the NDC and LTS would align to support an ambitious long-term pathway.	Q2 2021 estimated

Executive Development Program (MoPIC)	This is the most important strategic document for Jordan	Q1 2021 estimated
National environmental programme 2020-2030 (GIZ)	Unclear what the scope of this programme will be but it should be included in the LTS development when available	Unknown

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Appendices

A1 Summary review of Jordan’s existing strategies to inform the vision

A1.1 Overview of existing climate-related visions and goals in Jordan

A1.2 Summary of Jordan’s sectoral strategies and policies

A1.3 Summary of cross-cutting issues and priorities

A2 Summary of Jordan’s climate change response

A2.1 Transparency and Reporting: GHG emissions

A2.2 National strategic climate priorities

A2.3 NDC update 2020-2021

A2.4 Sub-national climate planning and actions

A2 Summary review of Jordan’s existing strategies to inform the vision

A2.1 Overview of existing climate-related visions and goals in Jordan

It is important that the vision for the LTS is consistent with the long-term climate and development goals contained within existing Jordanian national report and strategies i.e. that the LTS aligns with Jordan’s development goals. Therefore, a review has been carried out of the key national and sub-national plans and strategies in Jordan, and the results are presented below. The rating of H/M/L indicates their importance and relevance to the creation of the LTS vision. These have been derived from consultations with stakeholder and judgement/experience of the project team.

Table 10: Summary of strategies included in the review

Document	Description / Relevance to LTS	Importance (H / M / L)	Relevance (H / M / L)
Jordan 2025 and the awaited Executive Development Program (2021-2025)	Details Jordan’s social and economic development priorities (and challenges), that should be well aligned with (or addressed within) LTS.	H	H
Jordan’s National Energy Sector Strategy for 2020-2030	A ten-year plan which sets the roadmap to increase self-sufficiency through utilization of domestic natural and renewable resources, as well as expansion of existing energy developments to reduce reliance on costly fuel imports. The goals set out for the energy sector in this strategy (e.g. increasing energy efficiency in all sectors) will determine the country’s energy (and therefore GHG) pathway and so is fundamental to the vision and targets for the country.	H	H
Jordan National Water Strategy (2016-2025)	A strategy and action plan aiming to address the issue of water security in Jordan, which is likely to be exacerbated by the effects of climate change. This strategy also has specific objectives related to climate change adaptation for the water sector. The national water strategy, and the sector related policies (namely Climate Change Policy for a Resilient Water Sector (2016), Water Sector Policy for Drought Management (2018) , and the “Climate Change Policy for a Resilient Water Sector (2016)”) should underpin mitigation and adaptation actions and priorities in the LTS.	H	H
Jordan Long-term National Transport Strategy	The overall objective of the project is the development of the National Transport Strategy and of an Action Plan for its implementation. The actions/measures suggested for the transport sector should be considered in the development of the pathway and vision for the transport sector in the LTS.	H	H
The 2020-2025 National Agricultural Development Strategy	A national strategy focusing on digitizing and restructuring the agriculture sector, boosting its productivity, and addressing key sectoral challenges. The strategy should be considered when designing the adaptation priority actions as it highlights priority development areas, and because it aims at developing and restructuring of the agriculture sector and boosting its productivity through addressing challenges and building on strengths.	H	H

National Green Growth Plan (2017)	Serves as a reference to guide green growth projects and align green policies and investments with national development goals.	H	H
The Green Growth National Action Plans (2021-2025)	A multi-sector implementation plan that will support Jordan's economic growth objectives and climate change targets and build resilience to catastrophic events such as the COVID-19 pandemic.	H	H
National Strategy and Action Plan for Sustainable Consumption and Production in Jordan (2016-2025)	Addresses key human activities, which have a particular impact on the Jordanian environment including marine and coastal areas and related transversal and crosscutting issues. It defines common objectives and identifies actions guiding the implementation of the SCP at the national level.	M	M
First Voluntary National SDGs Review (2017)	Addresses the key SDGs for Jordan – the LTS should seek to provide synergies with these goals.	M	M
Jordan Response Plan JRP (2020-2022)	The JRP is the only national comprehensive plan through which the international community provides financial support to respond to Syria crisis. This is likely to be a key social issue in Jordan well into the future, so may wish to be considered in the LTS in terms of framing priorities and responses and ensuring inclusive prioritisation of measures the countries has/might face e.g. scarcity of resources (water and energy).	H	M
OECD Clean Energy Investment Policy Review of Jordan (2016)	A country-specific application of the OECD Policy. Guidance for Investment in Clean Energy Infrastructure that aims to help Jordanian policy makers strengthen the enabling conditions for investment in renewable electricity generation in Jordan. Relevant to financing of LTS.	M	M
The Jordan Economic Growth Plan (2018-2022)	Aims at achieving economic growth through economic, fiscal and sectoral strategies that outline the vision and policies pertaining to each sector. Key contributing sectors are detailed – these key sectors should be considered in the LTS.	L	L
National Climate Change Health Adaptation Strategy and Action Plan of Jordan (2013-2017)	This document assesses health-related vulnerabilities to climate change and adaptive capacities, and identifies vulnerable populations and regions. This information will be important for the adaptation section of Jordan's LTS.	L(as it was not updated, maybe after the NC4 it will be)	M

A2.1.1 “Jordan 2025”¹⁹⁶

The most important document to consider in the development of the Jordan LTS is "**Jordan 2025**", which is considered the 10-year (2015-2025) blueprint for economic and social development that the government has been following since 2015. It is built upon four pillars that will lead to the goal of a "**Prosperous and Resilient Jordan**":

- Citizens: Active citizens with a sense of belonging
- Society: Safe and stable society
- Business: Dynamic and globally competitive private sector
- Government: Efficient and effective government

¹⁹⁶ Government of Jordan (2014), "Jordan 2025": <http://inform.gov.jo/en-us/By-Date/Report-Details/ArticleId/247/Jordan-2025>

“Jordan 2025” (published by MoPIC in 2014) charts a path for the future and determines the integrated economic and social framework that will govern the economic and social policies, based on providing opportunities for all. Its basic principles include promoting the rule of law and equal opportunities, increasing participatory policy making, achieving fiscal sustainability and strengthening institutions.

The “Jordan 2025” represents a national vision and strategy rather than a detailed government action plan. The document identifies a set of goals that the Jordan government aspires to achieve through the adoption of procedures and policies on the sectoral level, including more than 400 policies or procedures that should be implemented through a participatory approach between the government, business sector and civil society.

The most important goals that the vision seeks to achieve include:

- Boost economic growth, achieve fiscal stability, reduce financial waste, delivery support to those who deserve it and reduce public debt to safe levels.
- Enhance the business and investment environment and raise the competitiveness to attract local and foreign investment, enhance partnership between public and private sectors and revisit the role of the private sector in terms of size and contribution to development priorities.
- Development of economic sectors through market creativity and honing the tools and means of high-value-added export-oriented sectors.
- Encouragement of small and medium-sized businesses, increasing financial support for these enterprises, providing them with suitable environment to prosper as engines as economic growth and promoting their role as employers of young people, by encouraging the spirit of entrepreneurship and innovation.
- Enhancement of the policies governing the labour market, focused on building a labour force through vocational training, especially youth and women.
- Increase women's participation in the labour market through specific programs.
- Giving necessary attention to people with special needs and work to fully integrate them into society.

The vision is divided into two sections. The first part summarizes Jordan's economic and social reality, addresses the challenges related to health, education, employment, economy, resource management and security issues related to water, energy, and food. These challenges are then analysed across the above four pillars (citizens, the society, the business sector, and the government).

The second section reviews the new growth model that enables the achievement of the goals and aspirations that the Jordan government aspires to achieve in 2025. It demonstrates ways to stimulate growth, achieve prosperity for Jordanians, determine required skills and resources, and review mechanisms to create an enabling environment. This section also reviews the baseline and targeted scenario for development, and includes the recommendations that reinforce the rule of law, strengthens the roles of institutions and encourage competition on all levels.

The “2025 vision” is based on two scenarios, a conservative one that assumes that the economy would grow by 4.8 per cent in 10 years, and an ambitious scenario that suggests the economy would expand by 7.5 per cent in 2025.

The Prime Minister's Delivery Unit is mandated to follow up on the most important initiatives proposed and overcome the obstacles facing their implementation in order to assure commitment and effective implementation.

The Evaluation & Institutional Development unit at Ministry of Planning and international Cooperation (MOPIC), will perform a mid-term evaluation of the plan during the current quarter (2021 Q1). They have prepared a draft Executive Program for 4 years (2021-2025) which will be the government's primary development program for the period to 2025. This should be published/launched by end of January 2021. The bases of preparing this program are:

- Jordan 2025
- SDGs Voluntary National Review
- All sectoral strategies, among which is the National Green Growth Plan (NGGP) 2017 and the 6 sector action plans.

The program was built around 24 development sectors and implementation will be carried out by 24 ministries, the Jordan investment commission and the central bank of Jordan. A national registry for governmental investment is operated by MoPIC and all future programs and projects should be authorized and assessed in terms of feasibility and priority by this registry. Involved in this process are the General Budget Department, public-private partnership (PPP) unit, and a new unit called the management of governmental investment unit.

RECOMMENDATION

Jordan 2025 is the key document to consider currently in the framing of the LTS and its vision – for example, the goals outlined above. Although it only extends to 2025, it is the main strategic and forward-planning document for the country. As such, the assumptions and goals of this plan should be one starting point – together with climate objectives – for the framing of a long term vision and the quantitative analysis that will support the pathway development (for example, growth assumptions).

The draft Executive Program for 2021-2025 currently in development should be the main reference for the LTS vision, once updated.

The 2025 vision and its anticipated EDP, are therefore considered the most recent holistic action plan issued by the government. It is expected to consider all sectoral strategies and all future governmental programs/plans will have to build on them.

It is therefore recommended to work closely with MoPIC to ensure that the LTS and future updates to the strategy are aligned. There is also an opportunity to approach MoPIC to explicitly include climate change in the Executive Program, or subsequent updates of this, which will build on the vision.

As neither Jordan 2025 or the Executive Program go beyond 2025, there is an opportunity for the LTS and the vision within in, to support MoPIC's development of future updates in the longer term and ensure that both the LTS and future Jordan vision strategies follow pathways that align.

Box 8: Executive Program implementation stakeholders

Ministries

1. [Ministry of Higher Education and Scientific Research](#) [Contact](#)
2. [Ministry of Finance](#) [Contact](#)

Jordan Customs

[Income and Sales Tax Department](#)
[Government Procurement Department](#)
[General Budget Department](#)
[Department of Lands and Survey](#)

3. [Ministry of Foreign Affairs and Expatriates](#) [Contact](#)

[Department of Palestinian Affairs](#)

4. [Ministry of Industry and Trade And Supply](#) [Contact](#)

[Civil Service Consumer Corporation](#)
[Jordan Standards and Metrology Organization](#)
[Jordan Enterprise Development Corporation](#)
[Companies Control Department](#)

5. [Ministry of Interior](#) [Contact](#)

[Public Security Directorate](#)
[Civil Status and Passports Department](#)

6. [Ministry of Justice](#) [Contact](#)

[Judicial Institute of Jordan](#)

7. [Ministry of Local Administration](#) [Contact](#)

[Cities and Villages Development Bank](#)

8. [Ministry of Planning and International Cooperation](#) [Contact](#)

[Department of Statistics](#)

9. [Ministry of Public Works and Housing](#) [Contact](#)

[Housing and Urban Development Corporation](#)

[Government Tenders Directorate](#)

10. [Ministry of Social Development](#) [Contact](#)

[National Aid Fund](#)

11. [Ministry of Tourism and Antiquities](#) [Contact](#)

[Department of Antiquities](#)

12. [Ministry of Transport](#) [Contact](#)

[Jordan Meteorological Department](#)
[Jordan Hijaz Railway Corporation](#)
[Land Transport Regulatory commission](#)
[Jordan Maritime Commission](#)
[Civil Aviation Regulatory Commission](#)

13. [Ministry of Water and Irrigation](#) [Contact](#)

[Jordan Valley Authority](#)

[Water Authority](#)

14. [Ministry of Labor](#) [Contact](#)

[Social Security Corporation](#)
[Vocational Training Corporation](#)
[Social Security Investment Fund](#)
[Development and Employment Fund](#)

15. [Ministry of Health](#) [Contact](#)

[Jordan Food and Drug Administration](#)

16. [Ministry of Agriculture](#) [Contact](#)

[National Agricultural Research Center](#)
[Agricultural Credit Corporation](#)
[Jordanian Cooperative Corporation](#)

17. [Ministry of Awqaf Islamic Affairs and Holy Places](#) [Contact](#)

[Awqaf Properties Development Department](#)

[Zakat Fund Directorate](#)

18. [Ministry of Digital Economy and Entrepreneurship](#) [Contact](#)

[Postal Saving Fund](#)

[Telecommunications Regulatory Commission](#)

19. [Ministry of Culture](#) [Contact](#)

[Royal Cultural Center](#)

[Department of The National Library](#)

20. [Ministry of Energy and Mineral Resources](#) [Contact](#)

[Energy and Minerals Regulatory Commission](#)

21. [Ministry of Education](#) [Contact](#)

22. [Ministry of Environment](#) [Contact](#)

23. [Ministry of Political and Parliamentary Affairs](#) [Contact](#)

24. [Ministry of Youth](#) [Contact](#)

Plus

The Investment Commission <https://www.jic.gov.jo/ar/home/>

Central Bank of Jordan <https://www.cbj.gov.jo/>

A2.1.2 Jordan's National Energy Sector Strategy for 2020-2030¹⁹⁷

The Ministry of Energy and Mineral Resources has recently published the National Energy Sector Strategy for 2020-2030. This is a ten-year plan which aims at setting the roadmap to increase self-sufficiency through utilization of domestic natural and renewable resources, as well as expansion of existing energy developments thus reducing reliance on costly foreign fuel imports that burden its economy.

It aims to reduce GHG emissions by 10% by 2030 compared to the BAU, from the base year 2018.

The main objectives for the energy sector as per the strategy:

- Diversification of energy sources by increasing the contribution of local energy sources to the total energy mix.
- Increasing energy efficiency in all sectors.
- Reducing energy costs for the national economy.
- Developing the energy sector system in Jordan to make it a regional centre for the exchange of energy in all its forms.

The Strategy, which assumes 2018 as base year, predicts the changes in contribution of different energy sources in electricity generation between 2020 and 2030 as illustrated in the following charts.

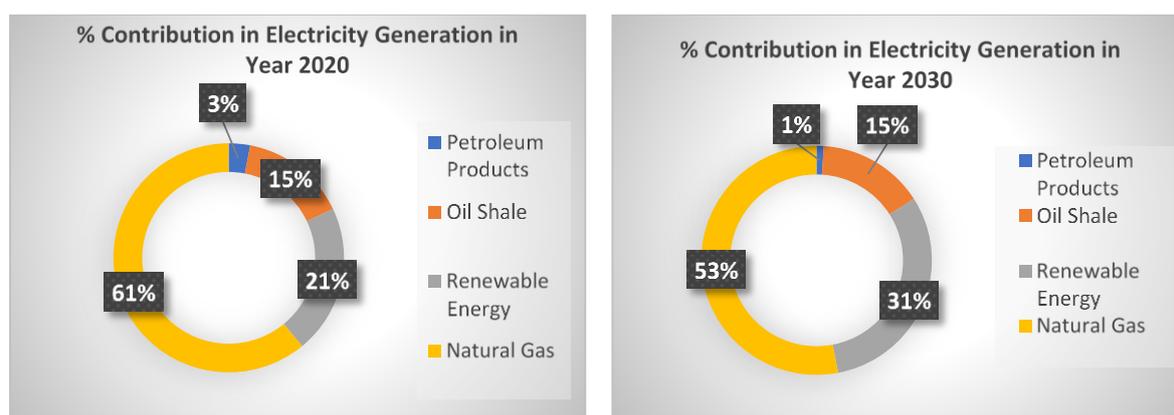


Figure 11: The National Energy Sector Strategy (2020-2030) forecast for electricity generation.

Source: National Energy Sector Strategy¹⁹⁸

Moreover, the new National Strategy (2020-2030) identified renewable energy usage alongside other sources as follows:

- Renewable energy to contribute 31% of electricity generation by the year 2030.
- Increasing energy efficiency in the water sector by 15% by 2025.
- Improving efficient energy consumption in all sectors by 9%.

The self-sufficiency scenario is chosen for the strategy: with increased requirements concerning energy security the scenario is formulated and analysed taking into consideration the committed projects and contracts and the current policies of MEMR, NEPCO and the other stakeholders of the Energy Sector in Jordan. The main philosophy of this scenario is to achieve minimum dependency as

¹⁹⁷ Ministry of Energy and Mineral Resources (2020), Energy Sector Strategy https://www.memr.gov.jo/AR/Pages/%D8%A7%D8%B3%D8%AA%D8%B1%D8%A7%D8%AA%D9%8A%D8%AC%D9%8A%D8%A9_%D9%82%D8%B7%D8%A7%D8%B9_%D8%A7%D9%84%D8%B7%D8%A7%D9%82%D8%A9?View=1059

¹⁹⁸ Ministry of Energy and Mineral Resources (2020), Energy Sector Strategy https://www.memr.gov.jo/AR/Pages/%D8%A7%D8%B3%D8%AA%D8%B1%D8%A7%D8%AA%D9%8A%D8%AC%D9%8A%D8%A9_%D9%82%D8%B7%D8%A7%D8%B9_%D8%A7%D9%84%D8%B7%D8%A7%D9%82%D8%A9?View=1059

well as maximum GHG emissions reduction through increased energy sustainability (for example, by charging electric vehicles with Renewable electricity and thus reducing emissions). The use of wind energy is necessary for charging electric vehicles at night and the local production of N. Gas from the Risha gas field increases significantly. This is further detailed below:

Self Sufficiency scenario - Summary

A 'Minimum Dependency' scenario, representing significant improvement of the energy security is formulated and analysed first taking into consideration the committed projects and contracts and the current policies of MEMR and the other stakeholders of the Energy Sector in Jordan. The main philosophy of this scenario is to achieve minimum dependency as well as maximum GHG emissions reduction through increased sustainability by charging electric vehicles with Renewable electricity and thus reducing emissions. Some additional use of wind energy is necessary for charging electric vehicles at night.

The main assumptions for the constitution of the Minimum Dependency scenario are related to the following parameters:

- ✓ The baseline evolution of the GDP.
- ✓ The planned and additional RES projects including the promotion of CSP with financial support aiming at the exploitation of the maximum potential, which is available.
- ✓ The planned energy efficiency investments assuming the fulfilment of the NEEAP targets leading to a reduction of the final energy demand by 17% in 2030.
- ✓ Reduction of energy consumption in water sector equal to 15%.
- ✓ The planned evolution of the electricity consumption and of the cost of the water sector.
- ✓ The existing and future capacity foreseen by the Refinery stakeholders.
- ✓ The foreseen natural gas quantities, prices and imports NDC with measures including the increase of natural gas production from Risha.
- ✓ The operation of the power plants according to the inputs provided by NEPCO.
- ✓ Planning the penetration of electric vehicles in order to be used as storage for RES in transport sector.

The main energy policy conclusions obtained from the analysis include the following:

Power Sector

- Combined use of Natural Gas and Renewables (PV, WIND, CSP) for future Electricity Generation.
- Incorporation of oil shale for base load electricity generation but with a limited capacity of 470 MW due to lack of flexibility and the increased GHG emissions of the oil shale plants.
- According to the least cost solution the variable RES total capacity does not exceed 2.7 GW by 2025 (vs 2.4 GW of existing permits) (36% of the installed capacity) and does not exceed 4.3 GW by 2030 (47% of the installed capacity), reaching 9.6 GW by 2050 (61% of the installed capacity).
- Installation of CSP with storage after starting from the next decade 2020-2030 and reaching a level of 1.8 GW by 2050.
- Wind energy will have to reach 3GW in 2050 to deal with the charging of electric vehicles overnight.
- Installation of pumped storage of 220 MW is introduced (selected) in 2024 for avoiding RES curtailment.

Oil Sector

- Exploitation of oil shale to produce synthetic oil.
- Scheduled refinery upgrade to proceed as planned by 2023, covering more than 91% of the local demand. According to the demand projection, the refinery output will cover around 90% of local demand of oil products by 2030. Therefore, any plans for new refinery installations should focus on exporting activities.

Natural Gas Sector

- Existing supply contracts more than adequate until 2030. The indigenous production of gas from the Risha field at a level of 200mmscfd includes high uncertainty and associated costs. The produced gas should be fed into the pipeline to be used in the final energy consumption. Further detailed studies are needed for this option.
- Although Natural Gas Imports are still above Noble contractual obligations there is a diversification of the use of Natural Gas in the demand sector and the presence of the gas of the Risha field is restricting the gas imports to the levels of the Noble obligations.
- LNG import option could be re-investigated (regarding the size) if the local gas production proceeds.

Energy Demand Sector

- Penetration of Natural Gas in the industrial sector. Penetration of Natural Gas in the residential and tertiary sector in order to decrease the GHG emissions replacing the remaining oil products. Increased use of CNG in transport.
- Increased use of public transport. High promotion of electric vehicles for the whole period 2020-2050.
- Use of solar energy for hot water production in residential (covering 15% of energy demand in the sector by 2030) and services sector (covering 8% of the energy demand in the sector by 2030).
- Solar energy in direct or indirect steam generation in industry, avoiding the use of conventional fuels and reducing GHG emissions.
- Penetration of high efficiency heat pumps in the tertiary sector for space cooling and heating.
- Implementation of the energy efficiency measures in the water sector. The water sector policy for energy efficiency is to reduce the amount of energy by 15% until 2025, ie an annual reduction of 1.5%. Assuming the same annual reduction rate for energy the cumulative reduction for the year 2030 will be 22.5%. For the next years up to 2050 the same reduction rate of 1.5% per annum can be considered.

Business as Usual scenario - Summary

A 'Business as Usual' scenario, representing continuation of 'current trends' is formulated and analysed first taking into consideration the committed projects and contracts and the current policies of MEMR. Crude oil prices according to the values provided by the technical committee. Moreover, the BaU scenario contributes to the fulfilment of the criterion of affordability.

The main assumptions for the constitution of the Reference scenario are related with the following parameters:

- ✓ The baseline evolution of the GDP.
- ✓ The planned RES projects including the promotion of CSP but without financial support.
- ✓ The existing and future capacity of the Refinery foreseen by the Refinery stakeholders.
- ✓ The foreseen natural gas quantities, prices and imports NDC with measures.
- ✓ The planned evolution of the electricity consumption and cost of the water sector.
- ✓ The operation of the power plants according to the inputs provided by NEPCO as described in the Annex.

The main **energy policy conclusions** obtained from the analysis include the following:

Power Sector

- ✓ Future electricity generation based on Natural Gas and Renewables.
- ✓ No additional Thermal Plants investment are needed for the period 2020-2030.
- ✓ Limits for Renewables are related to new operating conditions of Natural gas plants related to RES variations. Increased costs related to requirement for continuous shutdowns and the relevant PPA obligations. Increased maintenance of NG plants.
- ✓ In summary according to the least cost solution the RES total capacity does not exceed 2.6 GW (vs 2.4 GW of existing permits) by 2025 (20% of the total electricity generation) and does

not exceed 3.1 GW by 2030 (25% of the total electricity generation), and 4.1 GW by 2050 (25% of the total electricity generation).

- ✓ Incorporation of oil shale for base load electricity generation but with a limited capacity of 470MW due to lack of flexibility and the increased GHG emissions of the oil shale plants.

Oil Sector

- ✓ Exploitation of oil shale to produce synthetic oil.
- ✓ Refinery upgrade to proceed as planned by 2023 covering more than 86% of the local demand. According to the demand projection, refinery output will cover around 70% of local demand by 2030.

Natural Gas Sector

- ✓ Existing supply contracts adequate until 2030.
- ✓ Natural Gas Imports above Noble contractual obligations
- ✓ LNG import option to be retained for security of supply reasons.

Energy Demand Sector

- ✓ Penetration of Natural Gas in the industrial sector.
- ✓ Penetration of Natural Gas in the residential and tertiary sector in order to decrease the GHG emissions replacing the remaining oil products.
- ✓ Moderate penetration of solar energy for heat production (residential and services sector hot water) and steam in industry.
- ✓ Small penetration of CNG and EVs in transport.

KEY FINDING

This strategy will be critical for framing the energy (and emissions) transition pathways for Jordan, at least to 2030. It indicates that the country's vision is for greater energy diversification and local renewable energy development, but with no reduction in the share of electricity met by oil shale (high emissions intensity). This would likely not be consistent with long term decarbonisation pathways. Jordan will therefore need to review the post-2030 energy pathway and consider 'steeper decline' scenarios. Undertaking modelling of emissions pathways will support this.

Secondly, the reduction target of 10% by 2030 compared to the BAU is significantly below the level of ambition most countries are targeting in medium and long-term plans. Jordan therefore needs to consider whether there is scope for increasing this target through, for example, further increasing the renewable energy share.

A2.1.3 Jordan National Water Strategy 2016-2025¹⁹⁹

The water strategy and the water policies should be considered a reference and a building pillar for adaptation (water demand management and drought management) and mitigation (energy consumption in pumping).

Jordan faces a complex set of challenges related to water allocation efficiency to increase economic and social returns per drop, utility efficiency to reduce leakages and wasting valuable water and energy scarce resources, use of alternative energy sources to reduce footprint of water production and distribution, and finally to increase energy efficiency in operating water facilities and systems.

As water-food-energy nexus has been adopted by the mainstream sustainability discourse within the SDGs, MWI will build in coordination with other stakeholders a better understanding of the interdependence of water, food, energy and climate resources; the policy systems will catalyze an

¹⁹⁹ Ministry of Water and Irrigation (2016), "Jordan National Water Strategy 2016-2025": <http://extwprlegs1.fao.org/docs/pdf/jor156264E.pdf>

informed and transparent framework around determining trade-offs and synergies that meet demand, including of the poor, without compromising sustainability.

Climate change is another factor aggravating current water shortages. Since climate change will exacerbate the existing water scarcity in Jordan, MWI will develop and implement a policy and activities to adapt to phenomena. Innovative measures include wastewater reuse and desalination of brackish water. Adaptation measures include a wide range of activities targeting water scarcity.

Severe weather, erratic rainfall, drought, increasing temperatures, high evaporation rates and depleting groundwater recharge affect every aspect of Jordanian society. The most significant effects of climate change are felt by the water sector, where the impacts are significant and growing. The agricultural sector is particularly threatened by climate change and its impacts, since it is the largest water user in Jordan.

Existing climate information, knowledge and tools are not directly relevant for supporting adaptation decisions and actions; and weak national capacity to develop sectoral adaptation responses are part of the challenges.

Given the relevance of climate impacts to the water sector, the Jordan National Water Strategy is one of the most important for climate adaptation (alongside the Agriculture Development Strategy). Objectives in terms of climate adaptation are specifically identified as follows:

- Climate change impact on sustainable development and management of the national water resources will be the main focus of the “Impact of Climate change Policy on Water Sector”²⁰⁰ that will include strategic adaptation measures to build resilience in the water and wastewater services. The climate change risks will be taken into account in technical water sector policies, strategies, action plans and investment.
- Proactive and preventive water adaptation approaches in protecting the limited water resources with emphasis in drinking water resources and upgrading drinking water quality management system and surveillance programs.
- Ministry of Water and Irrigation (MWI) will implement the measures included in Jordan Intended National Determined Contributions (INDC’s) submitted by Ministry of Environment to COP21 Paris in Sept 2015.
- MWI will build capacities to grasp financing for the Climate adaptation measures.

Vulnerability to climatic changes and water shortages, current crisis water management and continuity in annual rainfall, economic and security risks prevalent in the region that directly affect the quality of life in the country. Conflicts in neighboring countries have added an additional burden on Jordan to host and provide for displaced populations. All these imperatives point to the need for Jordan to be disaster-ready by to systematically addressing risks in real time and protecting its populations from shocks and negative consequences of disasters and conflicts.

Given the scale and complexity of the humanitarian crisis in the region and its direct and adverse impact on Jordanians with regard to water and sanitation, MWI will work to streamline sectoral coordination mechanisms that will optimize the utilization of resources for the benefit of the Jordanian (and Syrian) populations within Jordan’s borders affected by the crisis.

Preparedness and response for natural disasters such as severe weather, flooding and extreme temperatures, and external and internal conflicts will be part of this strategy, MWI to consider a nationally developed and resourced humanitarian response plan specifically for WASH as a priority adaptation measure.

The National Water Strategy builds on the vision that by 2025, Jordan’s Water sector will gain more resilience and will have:

- A resilient water sector
- Access to safe, affordable and adequate water supply and sanitation for all Jordanians

²⁰⁰ Impact of Climate change Policy on Water Sector - Work on this has started but is not finalised and not expected for some time

- Adequate wastewater collection and treatment facilities for cities, small towns and major industries and mines are provided
- Public health and the environment, in particular groundwater aquifers, are protected.
- Efficient and productive use of water including cost recovery
- Responsible and efficient water management for all uses based on Integrated Water Resources Management (IWRM) principles including greater understanding and more effective management of groundwater and surface water
- A skilled and sustainable water sector adapting to increased population and economic development
- Innovative and efficient technologies, infrastructure and partnerships
- A viable and targeted legal and regulatory framework
- Well-resourced climate change adaptation plan
- Well-resourced humanitarian WASH sector coordination system
- Sector alignment and synergy with relevant national priorities and development plans

The Jordan National Water Strategy document therefore represents the vision and reference of the water sector, and is the base for the below related documents – the most important are highlighted in bold:

- 1. National Water Strategy 2016-2025**
2. Water Sector Capital Investment Program (2016-2025).
3. Water Demand Management Policy.
- 4. Energy Efficiency and Renewable Energy in the water sector Policy (with action plan 2015-2025)**
5. Water Substitution and Re-Use Policy.
6. Water Reallocation Policy.
7. Surface Water Utilization Policy.
8. Groundwater Sustainability Policy.
- 9. Climate Change Policy for a Resilient Water Sector (2016)**
10. Decentralized Wastewater Management Policy.
11. Action Plan to Reduce Water Sector Losses (Structural Benchmark).
- 12. Water Sector Policy for Drought Management (2018)**

RECOMMENDATION / KEY FINDING

No. 9 and no. 12 policies in the above list are UNDP and EU project deliverables. Whilst there is currently not good alignment of the processes for undertaking these strategies²⁰¹, the technical information within the policies and lessons learned in how to manage the drought at the national level will be useful for the identification of priority actions in the LTS. The drought unit has good technical capability, but would benefit from additional empowerment and sustainability of staff with technical modelling expertise (the modelling and technical expertise are of high importance to the LTS).

A2.1.4 Jordan Long-term National Transport Strategy²⁰²

The Jordan Ministry of Transport has developed the Jordan Long-term National Transport Strategy. The overall objective of the project is the development of the National Transport Strategy and of an Action Plan for its implementation. The approach of developing this strategy and the action plan was to review and update existing policy documents and strategies, to thoroughly analyse the current conditions of the transport system, to develop tools for analysis and forecast of conditions until 2030 (development of a National Transport Model), to develop tools for appraisal of investments and assessment of impacts of measures and strategies, to identify measures and to combine them into several alternative options, applying the transport model and the assessment tools to compare the options, to identify the most favourable option and to finally design the National Strategy based on these findings and an intensive consultation process with all relevant stakeholders in Jordan.

²⁰¹ Personal correspondence from engineer in the department that the process is “fragmented”

²⁰² Ministry of Transport (2014), “Jordan Long-Term National Transport Strategy”: http://www.mot.gov.jo/EBV4.0/Root_Storage/EN/EB_Info_Page/long-term_national_transport_strategy_project.pdf

Vision:

MoT's vision is to have a developed and sustainable transport sector, distinguished for competency, safety and environmental stability, enhancing the socio-economic development and making Jordan a regional hub for transport.

Mission:

- Setting and executing policies, aiming at developing and sustaining the transport sector.
- Boosting the role of the private sector and motivating this sector on investment, increasing the productivity of the transport sector.
- Setting a system of indicators, observing the abidance by safety and security measures and conserving the environment.
- Adopting the projects that can make Jordan a contact and communication point inside the region and between the region and the external world.

Of the “Policy Pillars”, ‘*Protect the environment and reduce negative impacts*’ notes the following:

- Transport activities imply (negative) effects in environmental, economic and social terms
- Decarbonising the transport sector requires combined polices aiming at increasing the modal share of low-carbon transport modes, and improving energy efficiency
- Promoting innovative technologies is one of the major fields where these combined policies may be applied
- Safety is a relevant issue hindering the transport sector and it should be improved with a set of complementary measures based on enforcement, education, vehicle roadworthiness tests and regulation, maintenance of infrastructures.

Further, ‘*Have citizens at the core of the transport policy*’ notes

- Mobility is a major facilitator of the quality of life and livelihood and directly influences citizens’ daily life and activities.
- Mobility is fully sustainable when it also addresses the impacts of transport activities in terms of social exclusion-related, economic and social cohesion, and demographic changes.

The Long-term National Transport Strategy is one of the few strategies that extends as far as a 2030 horizon, and whilst there is mention of “conserving the environment” it stops short of explicitly integrating climate and sustainable transport objectives with no mention specifically of climate change, low carbon technologies, reducing GHG emissions or adapting to climate impacts, only mentioning general environmental impacts such as air pollution.

Some actions identified for the medium (2024) and long term (2030) would be considered compatible with a low carbon pathway – expansion of rail and incentives to upgrade vehicles for example – but also include road widening and airport expansion and beyond the above pillar there is little explicit integration of environmental considerations in decision-making.

The sector main players are MoT, Ministry of Housing and public works (responsible for roads infrastructure outside Amman) GAM, two regulatory commissions (the Land Transport Regulatory Commission (LTRC), and Civil Aviation Regulatory commission (CARC)). They are Mandated with different roles on paper, but this needs review as the sector need better coordination in terms of managing the sector as well as in terms of climate action.

However, there is currently no alignment with the Transport Strategy of plans at, for example, Queen Alia International Airport, and in the Greater Amman Municipality. This has been identified as a problem in the Transport sector and a key recommendation more broadly would be for improved regulation of the transport sector through enhancing the power and authority of the Ministry of Transport and greater involvement in the National Climate Change Committee. (need empowerment, their involvement in the NCCC is not effective)

RECOMMENDATION / KEY FINDING

This strategy is the main document guiding the transport sector and future development, so is therefore important as a major emissions source. However, there is no reference explicitly to climate change and

only a brief mention of low carbon technologies. MoT should be empowered to lead the efforts on behalf of the commissions and MoPublic works and engaged as part of the LTS vision process to further enhance the commitments and visions for the transport sector. This will require capacity building at the level of decision makers, and likely a dedicated unit for climate change. MoT should also have better representation in the National Climate Change Committee.

A2.1.5 The 2020-2025 National Agricultural Development Strategy²⁰³

The Ministry of Agriculture has recently published the 2020-2025 National Agricultural Development Strategy, focusing on digitizing and restructuring the sector and boosting its productivity.

The strategy identified a total of 174 interventions and projects that will be financed through a host of channels, including the Treasury; from the Agricultural Credit Corporation and from foreign aid and grants.

The strategy has the following ambitious objectives:

- Increasing the agricultural GDP as a share of total GDP from 2.6 billion JD now to 3.66 billion JD by 2025 and boosting the added-value of agriculture to 2.48 billion JD from 1.6 billion JD.
- Increasing the forest area by 10% by 2025.
- Expanding pasture areas.
- Creating 65,000 jobs in the five-year period and replacing 21,000 foreign workers with Jordanians.
- Increase the number of farmers using digital government-run agricultural services by 30 per cent.
- Reducing export costs to facilitate a 15 per cent increase in agricultural exports.
- Increase the productivity of food and agricultural manufacturers by 18 per cent by 2025.
- The utilization of modern technology to enhance production and productivity, focusing on strategic crops.

The policy will address, as well, a number of challenges facing the agricultural sector, among which:

- The lack of comprehensive agricultural databases and poor utilization of modern technologies in agriculture that limited the agricultural producer's access to retailers and consumers.
- Marketing of products with the closure of neighbouring markets due to regional conditions and the need to facilitate export of agricultural products through the Queen Alia International Airport (QAIA).
- Lack of refrigerator trucks to transport fruit and vegetables ready for exporting.
- Compensating farmers for the damage to crops because of frost.
- The high cost of electricity for the agricultural sector.
- The need to better manage the issue of non-Jordanian workers in the sector.
- The need to support livestock breeders with feed, medicine and vaccines.
- Increase in fodder prices due to delay and decrease of rainfall.

There are only two places where climate change is mentioned in the strategy: water use efficiency and using genetic technology to combat climate change. There are lots of sustainable measures recommended (e.g. rangeland and forestry) but not linked specifically to climate change.

KEY FINDING

The strategy has an action plan and identification of the main challenges affecting the sector. It recommends mainly the use of ICT in sector management, and climate change is not clearly mentioned (mentioned only twice without any technical background). The strategy has a lot of recommendations on how to reform the sector and provides an action plan and a framework for reform, but the ministry needs capacity building on climate change at the level of decision makers to further integrate and take account of climate change.

²⁰³ National Agricultural Development Strategy - Not yet published online

Climate change is not well mainstreamed within the strategy overall and the ministry needs empowerment in order to be better involved in the long term low carbon planning.

A2.1.6 National Green Growth Plan (NGGP) -2017)²⁰⁴

Jordan has significant economic growth potential but is also facing equally significant environmental challenges and climate change exposure. A rapidly expanding population and industrial pollution have taken a toll on Jordan's environment. Considerable immigration within the region has also put additional stress on natural resources. Leveraging Jordan's growth potential in an environmentally sustainable manner will need to address challenges such as:

- Severe water shortages.
- Critical water systems degradation.
- Limited energy access and security.
- Waste management.

Based on existing national plans and documents, such as Jordan's Vision 2025 and Nationally Determined Contributions (NDCs), the National Green Growth Plan (NGGP) will **serve as a reference to guide green growth projects and align green policies and investments with national development goals**. This will be done through the 6 sectoral Action plans that were launched in June 2020, listed in the section below. This will be done through well-designed and analyzed action plans that highlight specific actions, their costs and who is the responsible party. From here, investors and donors will work with the government to identify actions to implement. The EDP will give these action plans focus, and the EU green deal will give the action plans projects priority²⁰⁵. The EBRD's first green financing facility announced on February 10th will support the implementation of these plans through finance²⁰⁶.

The NGGP seeks to understand what prevents Jordan from implementing the goals established in Jordan's current plans and strategies, and offers suggestions in the context of green growth for other aspirations that will help to futureproof Jordan's Vision. It applies green growth to Jordan as a practical approach that builds upon existing government strategies, primarily Vision 2025, and demonstrates pathways to achieving them in a sustainable way. This is reflected by a focus on shifting existing interventions towards implementation, defining not "what should be done" but rather "how it can be done well". This manifests in the usage of rigorous, quantitative appraisal of selected sectoral opportunities and providing a clear timeline for implementation.

NGGP is the strategic guidance on national green growth planning and implementation to advance the national actions in renewable energy, water conservation, ecotourism, waste management including recycling and clean transportation. The NGGP is the result of a wide consultative effort. Over a period of two years (2014-2016), extensive engagement of Ministries, environmental agencies and the private sector resulted in the formation of a group of green growth experts and supporters. The Plan tailored the green growth practical approach for the existing national strategies, primarily Vision 2025, and demonstrates pathways to achieving them in a sustainable way by understanding the challenges that prevent the government from achieving the goals of the current plans and strategies. The NGGP was approved by The Cabinet in 2017.

As a next step toward implementation Green Growth National Action Plans (GG-NAP) for six sectors were developed to outline green growth frameworks and actions for energy, water, agriculture, tourism, transport and waste to support implementation and strengthen resilience to build back better in recovery from future crisis such as COVID-19. Green Growth defined as "Economic Growth that is environmentally sustainable and socially inclusive" is a multi-sector development approach that is aligned with both 2030 Sustainable Development Agenda and Jordan's NDCs. So the sectoral action plans captures both adaptation and mitigation national measures that are already included in the

²⁰⁴ Ministry of Environment (2017), "National Green Growth Plan": <http://inform.gov.jo/en-us/By-Date/Report-Details/ArticleId/314/A-National-Green-Growth-Plan-for-Jordan-2017>

²⁰⁵ Mr Omar abu Eid, Environment and Energy focal point, EU Delegation to Jordan

²⁰⁶ <http://jordantimes.com/news/local/ebdrs-first-green-financing-facility-be-launched-jordan>

Jordan's NDC Action Plan and are climate finance opportunities. These plans were also considered in the Executive Development Program as the bases for any environmental considerations²⁰⁷.

The NGGP uses a cost-benefit analysis approach to identify the challenges and opportunities for project implementation and focuses on tackling these barriers in the six green growth sectors. The Cost-Benefit Analysis (CBA) been conducted for 24 green growth projects in Jordan aiming at identifying evidence-based recommendations on project financing options. The plan has identified **water, energy, agriculture, waste management, transport and tourism as the six main sectors** in which green economic projects are viable.

The NGGP has been a key document for mainstreaming environmental considerations in Jordan, although from the perspective of 'green growth' rather than climate change. The NGGP is the plan most aligned with the objectives of the government currently and was part Vision 2025 (although explicit reference to climate change and any targets was missed). The NGGP and its 6 sectoral action plans are to be well reflected within the government EDP (2021-2025) and will be potentially supported with finance from the green deal. Therefore, many projects will be either implemented or under implementation in the long run and the six sectors should be included as priority sectors for the LTS to focus on.

The LTS process can also learn from the NGGP development and publishing process in terms of its uptake from the government. The NGG sectoral plans participatory approach development as well as engagement/communication strategies could be something to learn from in terms of national buy-in.

RECOMMENDATION

It is recommended that the six main sectors of the NGGP form the sectoral basis of the LTS, i.e. sector-specific visions, strategies and actions should be framed around (at least) these six sectors, whilst taking into account the four cross-cutting pillars of Jordan 2025 (citizens, society, business and government) and additional priority sectors, e.g. Health.

A2.1.7 The Green Growth National Action Plans 2021-2025 (GG-NAPs)²⁰⁸

The developed GG-NAP is a multi-sector implementation plan that will support Jordan's economic growth objectives and climate change targets and build resilience to catastrophic events such as the COVID-19 pandemic.

Since 2017, Jordan has made the establishment of green growth a top national priority. The GG-NAP was created to expand on Jordan's climate and sustainable development ambitions by mainstreaming green growth, climate change, and sustainable development objectives into sectoral strategic frameworks. Sector-level action plans were developed for each of the priority green economy sectors: **Agriculture, Energy, Tourism, Transport, Waste and Water**. The action plans represent an important step in Jordan's transition to a green economy, strengthening cross-sector collaboration and emphasizing the importance of improving the enabling environment for green growth.

A summary of the GG-NAPs for each sector is found in section A2.2.

The GG-NAPs present one unified vision stated in the National Green Growth Plan for Jordan published in 2017²⁰⁹, for Jordan as a country with an expanding and sustainable economy that creates jobs, income for its citizen, and is resilient to external shocks and instability in the region. Jordan seeks to be a country of economic opportunity for everyone, providing decent work and living conditions based on an environmentally sustainable growth model. Vision 2025 provides the starting point for green growth and the NGGP, as an ambitious and forward-thinking document, already has high-level political support. To strengthen the integration of green growth into government strategies, the NGGP aligns its priorities

²⁰⁷ MoPIC stakeholder

²⁰⁸ Ministry of Environment (2020), "Green Growth National Action Plans": <https://gggi.org/launch-of-the-green-growth-national-action-plan-2021-2025/>

²⁰⁹ National Green Growth Plan for Jordan, <https://www.greengrowthknowledge.org/sites/default/files/A%20National%20Green%20Growth%20Plan%20for%20Jordan.pdf>

and objectives with development goals that have already been established by the Jordanian government in the Vision 2025.

The NGGP seeks to understand what prevents Jordan from implementing those goals, and offers suggestions for other aspirations that will help to protect Jordan's Vision into the future. The NGGP has a conceptual focus that reflects previous strategies prioritizing economic development and environmental sustainability in Jordan. However the NGGP builds upon existing research around Jordan's green growth potential; it is an innovative means of achieving the existing growth goals of Jordan in a manner that takes into account the factors that impact on the country's economic, social and environmental development in the longer term.

Sectoral strategies have been developed through a participatory approach and through numerous national meetings with all sectoral stakeholders. It was published in July 2020 (less than a year ago). Officials at MoPIC who are responsible for developing the executive development program EDP stated that the 6 sectoral action plans were among the sectoral strategies that were reviewed with the aim of incorporating them within the coming 5 year EDP (2021-2025).

KEY LESSON

The 6 action plans have been developed using an inclusive participatory approach which has not left anyone behind within the key sectors and noting that they were developed based on Jordan 2025 and they will be reflected within its national EDP – this momentum can be used as a stepping stone for the LTS vision. It is also possible to learn from the participatory approach, advocacy and the excellent communication strategy that was used in preparing those plans.

Secondly, the NGGP and GG-NAPs have impetus because they take Vision 2025 as the starting point for green growth, which gained high-level political support.

A2.1.8 National Strategy and Action Plan for Sustainable Consumption and Production in Jordan (2016-2025)²¹⁰

The National Strategy and Action Plan for Mainstreaming Sustainable Consumption and Production into Agriculture/Food Production, Transport, and Waste Management Sectors in the Hashemite Kingdom of Jordan (2016-2025) aims at supporting the implementation of agreed on SCP strategic, operational objectives and actions at the national level.

This document has been prepared in line with the regional SCP Action Plan for the Mediterranean, in cooperation with the SWITCH-Med Programme and financed by the European Union to support SCP common objectives in the region. Jordan's SCP Strategy and National Action Plan (NAP) addresses key human activities, which have a particular impact on the Jordanian environment including marine and coastal areas and related transversal and crosscutting issues. It defines common objectives and identifies actions guiding the implementation of the SCP at the national level.

A2.1.9 First Voluntary National SDGs Review (2017)²¹¹

Despite the numerous challenges Jordan is currently facing, the country has embarked on implementing the 2030 Agenda for Sustainable Development and achieving the SDGs. Jordan remains *determined to safeguard recent development achievements while ensuring a more resilient, prosperous and inclusive economy going forward. Jordan is committed to the 2030 Agenda and to leaving no one behind*²¹². The Government of Jordan has opted to prepare its first Voluntary National Review (VNR) and present it at the High Level Political Forum during the July 2017 session.

²¹⁰ Ministry of Environment (2016), "National Strategy and Action Plan for Sustainable Consumption and Production in Jordan": <http://www.fao.org/faolex/results/details/en/c/LEX-FAOC178828/>

²¹¹ MoPIC (2017), "First National Voluntary Review on the Implementation of the 2030 Agenda": <https://sustainabledevelopment.un.org/content/documents/16289Jordan.pdf>

²¹² Not an explicit vision statement but stated often by officials in stakeholder meetings

Through its participation, Jordan aspires to further strengthen national ownership of the 2030 Agenda, build a proactive momentum around it, and accelerate its realization. The process of preparing the voluntary review was led by the Ministry of Planning and International Cooperation (MOPIC), as the focal point for SDG implementation, with support from the United Nations Country Team in Jordan, including non-resident and regional agencies. The Higher National Committee on Sustainable Development provided overall strategic guidance and supervision. The review was carried out upon the five key themes indicated in the SDG framework (figure 5): People, Planet, Prosperity, Partnerships, and Peace and security.

The 2017 Voluntary National SDGs report of Jordan addressed the following key SD goals: SDG1 (No Poverty), SDG2 (No Hunger), SDG3 (Good Health and Well-being), and SDG5 (Gender Equality), and SDG9 (Industry, Innovation and Infrastructure).

It has also considered other priorities for Jordan with a focus on: Education (SDG4), Water (SDG6), Energy (SDG7), Prosperity and Decent Work (SDG8), Environment and climate change (SDG13), and Justice, human rights, and participation (SDG16).

KEY FINDING

Although this review of SDGs is not in itself a high priority document, SDGs in general are key in the governmental planning process²¹³ and so the review findings are critical to take into account in the LTS vision. Although not explicitly a ‘vision’ or goal, the statement highlighted above is often repeated by stakeholders and summarises the country’s ambitions in relation to the SDGs. It is also one of only two national level documents (the second is the Energy Strategy) that have a 2030 time horizon. It could therefore be considered for inclusion as part of the LTS vision.



Figure 12: Sustainable development and the linkages between the “5P’s”

Source: Global Development Research Center²¹⁴

A2.1.10 Jordan Response Plan JRP 2020-2022²¹⁵

More than nine years into Syria crisis, Jordan is still responding to the crisis by providing support, hosting 1.36 million Syrian refugees, and meeting their humanitarian and resilience needs. This

²¹³ MoPIC stakeholder

²¹⁴ Global Research Development Centre (2015) SDG Sustainability Dashboard <https://sdg.gdrc.org/post/128479353317/the-five-key-elements-5-ps-that-led-to-the>

²¹⁵ MoPIC (2020), “Jordan Response Plan”: <http://www.jrp.gov.jo/Files/JRP%202020-2022%20web.pdf>

resembles nearly 15% of Jordan's total population and puts Jordan as the host country of the second highest number of refugees per capita in the world.

The JRP presents a pioneering model on humanitarian crisis response, a three year rolling plan updated annually, where needs and proposed response are developed through the task forces composed of line ministries, donors' community, UN agencies and NGOs to mitigate the impact of Syria crisis.

The top priority of JRP 2020-2022 is to empower the systems to address such challenges, thereby protecting the dignity and welfare of Syrian refugees and vulnerable Jordanians impacted by Syria crisis. Its success will depend on the continued collaboration with the international community and their uninterrupted support. The JRP states:

"We commit to secure that we align our disparate activities within one comprehensive, government-led and utilized, partner-supported planning process and framework that delivers substantive, sustainable results in the humanitarian and development spheres alike" Jordan Partnership document prepared for Brussels II.

The JRP 2020-2022 shows Jordan's enduring commitment to continue to build an integrated multi-year framework to most effectively respond to Syria crisis in a transparent, collaborative and sustainable manner in line with the Global Compact on Refugees and the 2030 Agenda.

The JRP is the only national comprehensive plan through which the international community provides financial support to respond to Syria crisis, and collectively affirms support to sustain solidarity for Syrian refugees and vulnerable Jordanians through accelerating the support for Jordan Response Plan.

There are currently a number of proposed interventions for COVID-19 inspired from JRP:

1. Health: Provision of medical equipment and vehicles, maintenance and expansion of MoH facilities.
2. Education: Strengthening online education, building capacity of MoE in remote education maintenance, expansion of schools to absorb the increasing number of students.
3. Social Protection Assistance: Provision of food parcels, hygiene kits, and cash assistance.
4. Livelihood: Creation of Job opportunities, decent work environment, and support to small farmers

At present, there are no plans beyond 2022.

RECOMMENDATION / KEY FINDING

As refugees will not go back to their country within the near future, there is a need to consider this population in all short-term planning and reflect on the impact of this for long term planning also. In some areas in Mafraq and Irbid, Syrian refugees helped the local community in agriculture for example, and in cities like Amman they have established lots of businesses. The main lesson here is that Jordan needs to plan for the whole population in terms of mitigation and adaptation - i.e. planning sustainably for the worst-case scenario of an increasing population with limited resources.

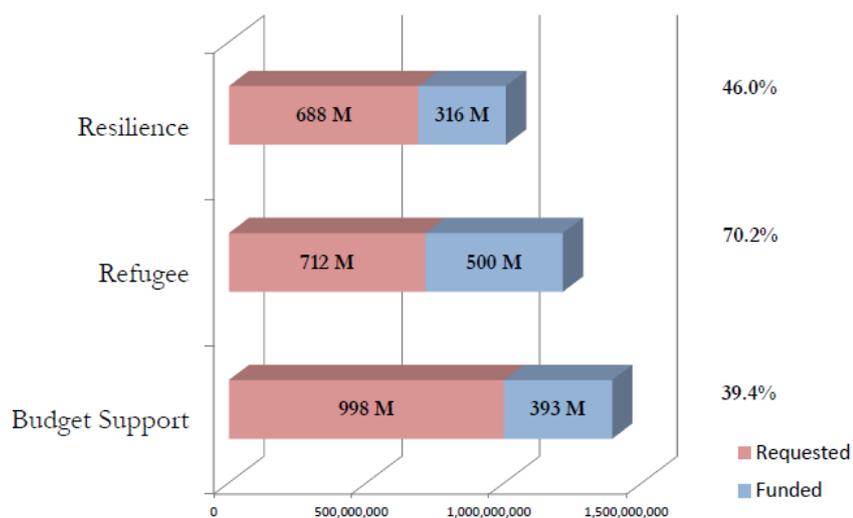


Figure 13: JRP 2019 funding by component

Source: Jordan Response Plan²¹⁵

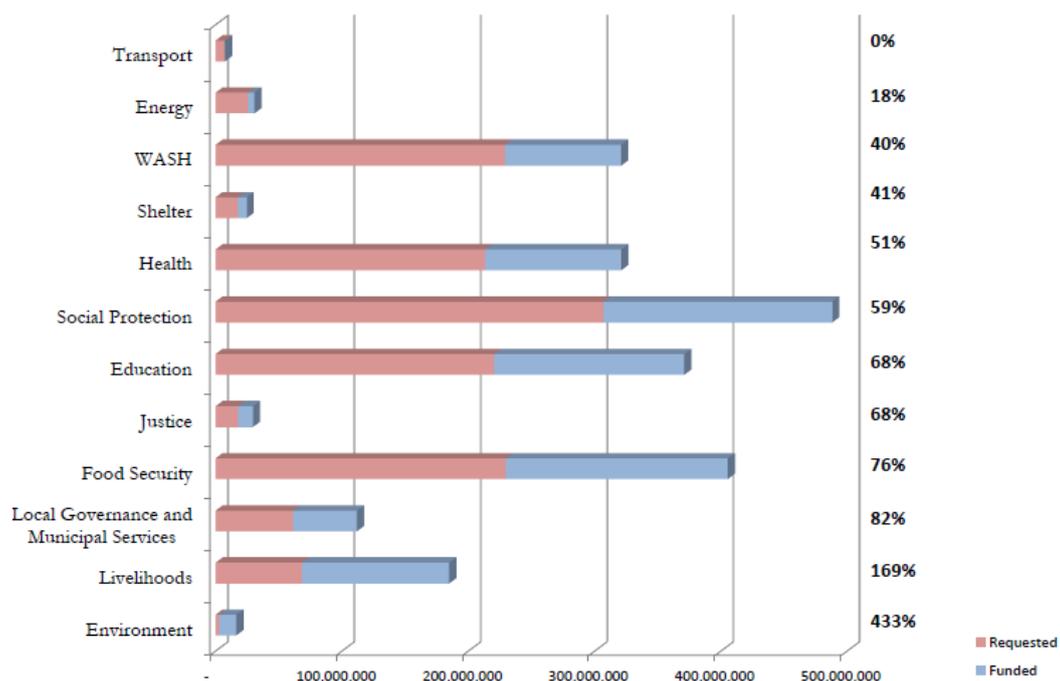


Figure 14: 2019 JRP funding by sector²¹⁵

Source: Jordan Response Plan²¹⁵

A2.1.11 OECD Clean Energy Investment Policy Review of Jordan (2016)²¹⁶

The Jordan Clean Energy Investment Policy Review is a country-specific application of the OECD Policy Guidance for Investment in Clean Energy Infrastructure. It aims to help Jordanian policy makers strengthen the enabling conditions for investment in renewable electricity generation in Jordan. The Policy Guidance is a non-prescriptive tool to help governments identify ways to mobilise private sector investment in clean energy infrastructure, especially in renewable electricity generation. The Policy Guidance was jointly developed by the OECD Working Party on Climate, Investment and Development (WPCID) of the Environment Policy Committee (EPOC) and the OECD Investment Committee, jointly with the Global Relations Secretariat (GRS). It benefited from significant inputs of the World Bank and the United Nations Development Programme (UNDP).

The Policy Guidance is a non-prescriptive tool to help governments identify ways to mobilise private sector investment in clean energy infrastructure, especially in renewable electricity generation. It is not therefore deemed to be particularly relevant to the LTS vision but may have lessons for mainstreaming.

A2.1.12 The Jordan Economic Growth Plan 2018-2022²¹⁷

The Jordan Economic Growth Plan is a national plan with a multi-sectoral approach. The timeframe of this Plan covers the 5 years between 2018 and 2022 but it will not be updated²¹⁸. The JEGP aims at achieving economic growth through economic, fiscal and sectoral strategies that outline the vision and policies pertaining to each sector. According to the JEGP document, Jordan's top five contributing sectors to GDP are **Government services, finance, manufacturing, transport, and tourism & hospitality** respectively. Apart from contributing to GDP, some sectors also significantly contribute to employment, provide Jordan with hard currency, and are contributors to Jordanian exports. In order to bolster Jordan's economic growth, growth strategies for these sectors comprising of a combination of policy reforms, government projects, and investment opportunities are presented in this report.

The JEGP addresses 19 areas and enabling environment by identifying 95 policy actions, 89 government projects that will cost USD 9.7 billion, and 23 private sector investments with a total value of USD 13.3 billion. These have no direct link to climate change, but some sectors and areas such as water, industry and transport do mention and consider the protection of the environment.

KEY FINDING

The JEGP was considered to be important during the literature review (based in the programs of the previous government) but the current government have updated its programs due to the changes in circumstances and thus the government will rely mainly on the newly developed Executive Development Program (EDP) that will reflect clearly and timely the current situation taking into account the COVID-19 impacts on the economy. The awaited 5 year EDP above, based on Jordan 2025 will be launched at the end of February 2021; therefore, it is understood that the development of the LTS should rely mainly on the Jordan 2025 and its EDP document.

²¹⁶ OECD (2016), "OECD Clean Energy Investment Policy Review of Jordan": https://read.oecd-ilibrary.org/finance-and-investment/oecd-clean-energy-investment-policy-review-of-jordan_9789264266551-en#page9

²¹⁷ Economic Policy Council (2018), "Jordan Economic Growth Plan": [http://www.fao.org/faolex/results/details/en/c/LEX-FAOC170691/#:~:text=The%20Jordan%20Economic%20Growth%20Plan%202018%20%2D%202022%20\(JEGP\)%20aims,policies%20pertaining%20to%20each%20sector.&text=A%20strategic%20reserve%20of%20basic,built%20to%20strengthen%20god%20security](http://www.fao.org/faolex/results/details/en/c/LEX-FAOC170691/#:~:text=The%20Jordan%20Economic%20Growth%20Plan%202018%20%2D%202022%20(JEGP)%20aims,policies%20pertaining%20to%20each%20sector.&text=A%20strategic%20reserve%20of%20basic,built%20to%20strengthen%20god%20security).

²¹⁸ MoPIC source

A2.1.13 National Climate Change Health Adaptation Strategy and Action Plan of Jordan (2013-2017)²¹⁹

The Ministry of Health (MOH) developed the National Climate Change Health Adaptation Strategy and Plan of Action, with WHO/CEHA technical and financial assistance, under the *Joint Program of Adaptation to Climate Change to Sustain Jordan's MDG Achievements, Output 2.3: Adaptation Measures by the Health Sector to Protect Health from Climate Change are Institutionalized*.

The health-related vulnerabilities to climate change were assessed, as well as adaptive capacities. Vulnerable populations and regions were also identified. The impact of climate change on six climate-sensitive health issues (air-borne and respiratory diseases, water and food-borne diseases, vector-borne diseases, nutrition, heat waves, and occupational health) were evaluated. Health vulnerability and adaptation assessment to climate change over the next 25-30 years was carried out by six MoH specialized teams and national experts for the six health issues.

“The general goal is to plan climate-change adaptation measures for the health system to prevent existing and future risks, respond punctually, and increase resilience and preparedness.”

In undertaking the review of climate impacts on health, adaptation actions/measures/ interventions for each of the climate-sensitive health issues were identified and classified into 7 major categories:

- Regulatory/ legislative
- Capacity building
- Public education and communication
- Surveillance and monitoring
- Medical intervention
- Infrastructure development
- Research and further information

The Strategy found that

“A resilient health sector with adequate infrastructure and widespread access to primary healthcare services is fundamental to reduce the population’s vulnerability to the impacts of the changing patterns of diseases due to climate change. Health professionals must be trained to better understand the potential impacts of climate change on health. Improving health systems is a clear “no-regrets” option for adaptation.”

²¹⁹ Ministry of Health (2012), “National Climate Change Health Adaptation Strategy and Action Plan of Jordan”: https://www.moh.gov.jo/EchoBusV3.0/SystemAssets/PDFs/PDFs%20AR/Strategies_AR/%D8%A7%D8%B3%D8%AA%D8%B1%D8%A7%D8%AA%D9%8A%D8%AC%D9%8A%D8%A9%20%D9%88%D8%AE%D8%B7%D8%A9%20%D8%B9%D9%85%D9%84%20%D8%AA%D9%83%D9%8A%D9%81%20%D8%A7%D9%84%D9%82%D8%B7%D8%A7%D8%B9%20%D8%A7%D9%84%D8%B5%D8%AD%D9%8A.pdf

This is underpinned by a set of guiding principles, in Box 9.

The Guiding Principles

- Climate change is first and foremost a public health issue;
- The goals of the public health system are to promote health, prevent illness, and protect the health of the population;
- Encourage mitigation and adaptation strategies that maximize health co-benefits, and minimize unintended consequences (adverse health impacts);
- Prioritize adaptation actions;
- adopting multiple-benefits and no-regret adaptation options;
- Provide and maintain the required resources to implement adaptation activities to minimize the impacts of climate change on human health and well-being;
- Promote healthy, sustainable, and resilient populations to increase preparedness for unavoidable climate change impacts;
- Reduce health inequities and ensure health promotion and protection for vulnerable populations and communities;
- Build knowledge, awareness and understanding of climate change impacts on human health and the need to prepare for these changes;
- Enable dialogue between decision-makers, researchers, businesses, NGOs, local communities, etc to implement appropriate and accepted actions for achieving sustainable population health;
- Cooperate with identified stakeholders.

Box 9: Guiding principles of the National Climate Change Health Adaptation Strategy and Action Plan of Jordan (2013-2017)

KEY FINDING

Climate change is not well considered within the Ministry of Health mandate. There is a need for better planned, scientific based actions on the long run in order to be part of any LTS.

A2.2 Summary of Jordan's sectoral strategies and policies

The following section summarises Jordan's main sectoral visions and strategies.

A2.2.1 Energy

National Energy Sector Strategy (2020-2030)

See section A2.1.2

Energy Sector Green Growth National Action Plan (2021-2025)²²⁰

The Energy Sector Green Growth Action National Action Plan 2021-2025 (GG-NAP) outlines a green growth framework and actions for the sector aligned with the National Green Growth Plan (NGGP), Jordan Vision 2025, and Nationally Determined Contributions (NDCs) under the Paris agreement. At the heart of the green growth approach lies the leveraging of the sector's resilience through economic growth that is environmentally sustainable and socially inclusive.

The GG-NAP outlines five national green growth objectives on which the Energy Sector GG-NAP was developed:

1. Enhance Natural Capital
2. Sustainable Economic Growth

²²⁰ Ministry of Environment (2020), "Energy Sector Green Growth National Action Plan 2021-2025": https://qggi.org/site/assets/uploads/2020/10/20022_Jordan_Energy_v04_HL_Web.pdf

3. Social Development and Poverty Reduction
4. Resource Efficiency
5. Climate Change Adaptation and Mitigation

From these five national objectives, the Energy Sector GG-NAP identifies 16 sector sub-objectives that serve to mainstream the overarching green growth objectives into energy sector policies and investments:

Enhanced Natural Capital

- a. Limit air pollution from fossil fuel use
- b. Reduce impact on natural resources from energy and minerals exploration and production, including water

Sustainable Economic Growth

- a. Reduce the country's reliance on fossil fuel imports
- b. Increase the affordability of energy for industrial and commercial consumers
- c. Support the reduction of energy sector-based public debt
- d. Increase competition and strengthen regulation of the electricity market
- e. Enhance innovation and technical capacities in the energy sector

Social Development and Poverty Reduction

- a. Improve the affordability of clean energy for low-income communities
- b. Maintain access to reliable, affordable and sustainable energy for all
- c. Increase opportunity for employment in the energy sector, especially for women and youth
- d. Enable refugees and host communities to access adequate, affordable and secure energy supply

Resource Efficiency

- a. Increase use of waste to energy approaches to produce energy (biofuels and electricity generation)
- b. Reduce energy network losses and improve energy management in utilities
- c. Increase the efficiency of energy use (including electricity and fuels)

Climate Change Adaptation and Mitigation

- a. Decrease total consumption of energy from fossil fuel resources
- b. Decrease total GHG emissions from energy sector activities

A2.2.2 Transport

Long-term National Transport Strategy

See section A2.1.4

Transport Sector Green Growth National Action Plan (2021-2025)²²¹

The Transport Sector Green Growth Action National Action Plan 2021-2025 (GG-NAP) outlines a green growth framework and actions for the sector aligned with the National Green Growth Plan (NGGP), Jordan Vision 2025, and Nationally Determined Contributions (NDCs) under the Paris agreement. At the heart of the green growth approach lies the leveraging of the sector's resilience through economic growth that is environmentally sustainable and socially inclusive.

The GG-NAP outlines five national green growth objectives on which the Transport Sector GG-NAP was developed:

1. Enhance Natural Capital

²²¹ Ministry of Environment (2020), "Transport Sector Green Growth National Action Plan 2021-2025": https://gggi.org/site/assets/uploads/2020/10/20022_Jordan_Transport_v11_HL_Web.pdf

2. Sustainable Economic Growth
3. Social Development and Poverty Reduction
4. Resource Efficiency
5. Climate Change Adaptation and Mitigation

From these five national objectives, the Transport Sector GG-NAP identifies 18 sector sub-objectives that serve to mainstream the overarching green growth objectives into transport sector policies and investments:

Enhanced Natural Capital

- a. Reduce air pollutant emissions (PM2.5, PM10, NOx, and SOx) from road transport
- b. Promote the use of green infrastructure in transport sector and investment planning

Sustainable Economic Growth

- a. Increase public funding for public transport infrastructure and service provision
- b. Increase the gross value-added of the freight and logistics sector through sustainable services and infrastructure
- c. Increase access to reliable, affordable, and safe public transport services in urban areas
- d. Improve connectivity and accessibility for passengers and goods between and within governorates and key growth areas
- e. Increase private sector participation in transport sector investments

Social Development and Poverty Reduction

- a. Increase access to reliable, affordable, and safe public transport services for all, including women, youth, and rural communities
- b. Reduce the number of deaths related to traffic accidents and transport-related air pollution
- c. Improve the working conditions for transport sector employees
- d. Enhance the safety and walkability of pedestrian walkways in urban area
- e. Reduce monthly average household expenditure on transport

Resource Efficiency

- a. Promote the use of electric and hybrid vehicles through strengthened regulations and incentives
- b. Promote non-motorized transport modes and provide necessary infrastructure
- c. Use technology to improve traffic conditions and aid in traffic management
- d. Reduce the amount of waste generated in the transport sector

Climate Change Adaptation and Mitigation

- a. Reduce GHG emissions (CO2) from the transport sector
- b. Promote the use of climate-resilient infrastructure in transport sector investment planning

A2.2.3 Industry

Jordan Economic Growth Plan (2018-2022)²¹⁵

INDUSTRY SECTOR (p.66)

Goals: Expanding the industrial manufacturing base, increasing available production capacity, enhancing the competitiveness of service sectors, providing an enabling business environment and creating job opportunities for Jordanians; all through building concrete and effective partnerships with the private sector.

The industrial sector policy is based on the following:

1. Developing Jordanian industrial products and services and encouraging creativity and innovation
2. Providing a stimulating environment for investment and promoting potential investment opportunities

3. Improving the quality of local products and adapting them to international specifications and increasing their competitiveness
4. Promoting the participation of women in the industrial sector
5. Simplifying administrative and government procedures
6. Transitioning from traditional ubiquitous industries to high value added unique and interdependent industries (Product Space Strategy)
7. Adhering to international standards and taking necessary measures to prevent unfair practices (including dumping) which affect the competitiveness of domestic products

Note: the JEGP was considered to be important during the literature review (according to the previous government) but the current government will rely more on the newly developed Executive Development Program (EDP)²²². This will be launched at the end of February 2021. As such, it is currently unclear which strategy will be most important for the industry sector going forwards. The National Strategy and Action Plan for Sustainable Consumption and Production in Jordan (2016-2025) may be relevant to consider for the framing of the industry sector in the LTS.

A2.2.4 Agriculture

National Agricultural Development Strategy (2021-2025)

See section A2.1.5

Agriculture Sector Green Growth National Action Plan (2021-2025)²²³

The Agriculture Sector Green Growth Action National Action Plan 2021-2025 (GG-NAP) outlines a green growth framework and actions for the sector aligned with the National Green Growth Plan (NGGP), Jordan Vision 2025, and Nationally Determined Contributions (NDCs) under the Paris agreement. At the heart of the green growth approach lies the leveraging of the sector's resilience through economic growth that is environmentally sustainable and socially inclusive.

The GG-NAP outlines five national green growth objectives on which the Agriculture Sector GG-NAP was developed:

1. Enhance Natural Capital
2. Sustainable Economic Growth
3. Social Development and Poverty Reduction
4. Resource Efficiency
5. Climate Change Adaptation and Mitigation

From these five national objectives, the Agriculture Sector GG-NAP identifies 17 sector sub-objectives that serve to mainstream the overarching green growth objectives into agriculture sector policies and investments:

Enhanced Natural Capital

- a. Reduce air, soil and water pollution resulting from agriculture and food production processes
- b. Increase the area of degraded lands for restoration in the rangelands/Badia ecosystem
- c. Protect the area of forested land and increase the rate of afforestation and reforestation

Sustainable Economic Growth

- a. Increase transparency and the use of evidence-informed decision making by public and private sector agriculture stakeholders
- b. Improve the quantity and quality of agricultural product such that it is in line with international standards

²²² Ms Lamia Alzubi, MoPIC

²²³ Ministry of Environment (2020), "Agriculture Sector Green Growth National Action Plan 2021-2025": https://gggi.org/site/assets/uploads/2020/10/20022_Jordan_Agriculture_v07_HL_Web.pdf

- c. Enhance the quantity and quality of public-private-civil society exchange regarding agriculture sector development
- d. Increase public and private investment in technology and systems for modernizing and greening on- and near-farm agricultural processes

Social Development and Poverty Reduction

- a. Improve the skills and capacity of farmers, rural communities, youth and women to undertake sustainable agriculture
- b. Increase remunerative and socially inclusive rural employment by supporting vulnerable members of society to improve ecosystem integrity and create sustainable income generating opportunities
- c. Reduce the impact of environmental and economic shocks on the most vulnerable members of society (particularly farmers, women, youth, and rural communities)

Resource Efficiency

- a. Increase the practice of water re-use of treated wastewater for agricultural purposes
- b. Increase the amount of agriculture sector's waste biomass used as a resource (compost, energy, and food/fodder value-add)
- c. Increase use of resource efficient technology to reduce consumption and cost of water, energy, and waste management on farms and in agro-processing

Climate Change Adaptation and Mitigation

- a. Increase use of high-yield, drought and salinity-resistant plant varieties
- b. Develop and implement policy and fiscal tools that encourage the take-up of adaptive techniques and technologies
- c. Introduce the concept of climate smart agriculture on farms
- d. Increase carbon sequestration capacity of Jordan's land and forest

A2.2.5 Waste

National Municipal Solid Waste Management Strategy (2015-2034)²²⁴

The current legal and policy SWM frameworks and other MSWM related documents report several gaps and deficiencies in the sector²²⁵. The ability to establish sustainable materials recovery is one of them. The frameworks of recyclable materials recovery need to be evaluated and adjusted to the context of reaching Jordan goals outlined in the "National MSWM Strategy 2015".

The National SWM strategy in Jordan will govern the current and upcoming relevant regulatory frameworks toward better organized, regulated and cost-effective waste management services promoting the involvement of the private sector in the development of an integrated SWM industry.

The short-term planning of the National SWM strategy in Jordan (2015 - 2024) promotes recycling and reuse activities through the establishment of pilot separate collection systems for recyclables (at least paper, metal, plastic and glass), formulating relevant technical regulations and addressing the legislative frameworks required for proper recycling practices, public awareness and educational programs. The expansion of MSW recycling and separation schemes is to be achieved within the mid-term agenda by the year 2024. The construction of mechanical and/or biological treatment facilities,

²²⁴ LDK (2014), "Development of a National Strategy to Improve the Municipal Solid Waste Management Sector in the Hashemite Kingdom of Jordan" – 1st draft report (note that a third draft is available, but not online) [https://www.mola.gov.jo/ebv4.0/root_storage/ar/eb_list_page/\(1st_draft_report\).pdf](https://www.mola.gov.jo/ebv4.0/root_storage/ar/eb_list_page/(1st_draft_report).pdf)

²²⁵ Aldayyat, E. *et al.* (2019), "Solid Waste Management in Jordan: Impacts and Analysis": https://www.researchgate.net/publication/330925093_Solid_Waste_Management_in_Jordan_Impacts_and_Analysis

and other sophisticated material recovery systems are to be achieved by 2034 according to the strategy²²⁶.

This is the only National strategy in Jordan that goes beyond 2030, in large part because it is heavily supported by the EBRD and EU, with subsequent funding. It will be important to ensure that the commitments to waste management, particularly those involving committed or in-development treatment infrastructure, are consistent with the long term vision for the country (and vice versa).

Decentralized Wastewater Management Policy (2016)²²⁷

The need for establishing a decentralized wastewater management approach has been seen for some time. Indeed a decentralized wastewater management approach was envisaged in Jordan's Water for Life Strategy²³⁰ (see section A2.2.5). Since 2012 there have been significant changes in the water sector's operational environment due to the demands associated to the overwhelming influx of dislocated population to Jordan. To expand wastewater management by implementing the practice of recycling and reusing water beyond the existing conventional wastewater service system has become imperative for the viability of our water resources as emphasized in the new National Water Strategy 2016-2025.

Jordan's water balance will benefit greatly from successful implementation of this Policy and hence this Policy will guide and direct my decisions as Minister and those of my Ministerial Colleagues. It will shape our national approach to planning, implementing and operating decentralized wastewater management infrastructure over the next decade.

The scope of this Policy is broad, reflecting the wide spectrum of decentralized wastewater management and the many tasks to be performed for successful implementation and sustainable operation. In light of an integrated water resources management approach, this Policy is carefully formulated taking comprehensive account of regulation, standards, and inter-sectorial responsibilities while maintaining the imperative of the protection of public health and water resources.

Water Substitution and Re-Use Policy (2016)²²⁸

This sectoral Policy is an integral part of the National Water Strategy 2016-2025. It is a national wide document aiming at a more efficient use of water resources through reusing treated wastewater in irrigation that enables freeing fresh water for municipal uses. The long-term goal is to achieve water security in the country. It also provides for: (i) using the treated wastewater in other economic activities; (ii) expanding collection and treatment of wastewater; (iii) updating and developing standards and practices for substituting fresh water used in irrigation by treated wastewater after blending it; (iv) decreasing the demand for groundwater; and (v) ensuring sustainability and protecting the environment and nature in applying these actions. The Policy takes into consideration different aspects of the sector that favour and improve its implementation, such as: (i) substitution priorities (high priority shall be given to Jordan Valley); (ii) institutional and administrative issues (i.e. tariff setting, choice of the right types of produce and best irrigation and marketing practices, monitoring programs, private sector participation, community based initiative organizations); (iii) resource management; (iv) legislation; (v) public awareness; and (vi) technology, research and development issues.

To make agriculture more productive and sustainable, the Policy proposes an increased use of treated wastewater for irrigation. In order to enable a more inclusive agricultural system, community-based initiative organizations and nongovernmental organizations will be part of the process. To increase the

²²⁶ Umwelt Bundesamt (2018), "Waste Management strategy link with SDG / National Monitoring Information system": https://unstats.un.org/unsd/envstats/meetings/2018-Arab%20Region/documents/Session%205.2_UBA%20for%20Jordan_data%20on%20waste.pdf

²²⁷ Ministry of Water and Irrigation (2016), "Decentralized Wastewater Management Policy": <http://inform.gov.jo/Portals/0/Report%20PDFs/6.%20Infrastructure%20&%20Utilities/water/Decentralized%20Wastewater%20Management%20Policy.pdf>

²²⁸ Ministry of Water and Irrigation (2016), "Water Substitution and Reuse Policy": <http://inform.gov.jo/Portals/0/Report%20PDFs/6.%20Infrastructure%20&%20Utilities/water/Water%20Substitution%20and%20Reuse%20Policy.pdf>

resilience of livelihoods to disasters, given that the Policy is part of mitigation measures of the effect of climate change, shall be established an integrated approach to water resources management, combined with locally appropriate and sustainable risk reduction measures, and the active involvement of stakeholders from different sectors. As for the Governance, it is needed the institutional support to these policies at all levels which include enforcement of a suitable legal framework and regulatory tools, enhancing efficient institutional capacities, and supporting dynamic management plans that adapt the concepts of participation and decentralization. In fact, although this Policy can be better implemented through centralized wastewater collection and treatment systems, the decentralized systems are needed to suit different locations. Local reuse systems should also accompany the decentralized systems.

Waste Sector Green Growth National Action Plan (2012-2025)²²⁹

The Waste Sector Green Growth Action National Action Plan 2021-2025 (GG-NAP) outlines a green growth framework and actions for the sector aligned with the National Green Growth Plan (NGGP), Jordan Vision2025, and Nationally Determined Contributions (NDCs) under the Paris agreement. At the heart of the green growth approach lies the leveraging of the sector's resilience through economic growth that is environmentally sustainable and socially inclusive.

The GG-NAP outlines five national green growth objectives on which the Waste Sector GG-NAP was developed:

1. Enhance Natural Capital
2. Sustainable Economic Growth
3. Social Development and Poverty Reduction
4. Resource Efficiency
5. Climate Change Adaptation and Mitigation

From these five national objectives, the Waste Sector GG-NAP identifies 14 sector sub-objectives that serve to mainstream the overarching green growth objectives into waste sector policies and investments:

Enhanced Natural Capital

- a. Minimize the emission of pollutants (gaseous, liquid, and solid) through the final disposal of waste;
- b. Ensure adequate collection and treatment of hazardous wastes to prevent environmental contamination;
- c. Reduce the adverse impacts of waste and landfills on the health of ecosystems.

Sustainable Economic Growth

- a. Support the development of SMEs and access to sustainable waste services across the full waste value chain;
- b. Increase private sector investment and innovation in all phases of the waste value chain, including through domestic and foreign direct investment;
- c. Promote awareness and behaviour change in government, business, and society towards circular economy through the waste sector;
- d. Increase the government's capacity to implement evidence-based policies and incentives in the waste sector.

Social Development and Poverty Reduction

- a. Increase the number of inclusive decent, green jobs in the waste sector;

²²⁹ Ministry of Environment (2020), "Waste Sector Green Growth National Action Plan 2021-2025": https://gqi.org/site/assets/uploads/2020/10/20022_Jordan_Waste_v03_HL_Web.pdf

- b. Enhance the rate of labour market formalization of the waste sector to enhance economic inclusion and protection of workers.

Resource Efficiency

- a. Mainstream the concepts of reduction in waste generation, recycling, and re-use in the governance of all waste streams;
- b. Increase the amount of waste diverted from landfills toward recycling and re-use;
- c. Promote inclusive innovation in technology and processes to leverage waste-to-resource and waste-to-energy potential.

Climate Change Adaptation and Mitigation

- a. Reduce greenhouse gas emissions from landfills and dumpsites, particularly methane gas resulting from decomposed organic matter;
- b. Improve the resilience of waste management and treatment infrastructure to climate-related disasters (such as floods).

A2.2.6 Water

National Water Strategy 2016-2025

See section A2.1.3

Water for Life 2008-2022²³⁰

Jordan's 'Water for Life' strategy splits up the water sector into the following key areas:

- Water demand
- Water supply
- Institutional reform
- Water for irrigation
- Wastewater
- Alternative water resources

For each of these areas, the strategy assesses their current status, future challenges, goals for 2022, and approaches to achieve the vision. The 2022 goals for each of these key areas are summarised below:

Water demand

1. Irrigated agriculture in the highlands will need to be capped and regulated and the by-laws will need to be reinforced.
2. Appropriate water tariffs and incentives will be introduced in order to promote water efficiency in irrigation and higher economic returns for irrigated agricultural products
3. Jordanians are well aware of water scarcity and the importance of conserving and protecting our limited water resources.
4. Viable options to reduce water demand within each sector are readily available.
5. Water tariffs within and outside the water sector should support water demand management.
6. Non-revenue water to be 25% by 2022.

Water supply

1. Uninterrupted safe and secure drinking water supply achieved including continuous flow in Amman, Zarqa, Irbid, and Aqaba.
2. Water supply from desalination is a major source.
3. Drinking water resources are protected from pollution.

²³⁰ Ministry of Water and Irrigation (2009), "Water for Life: Jordan's Water Strategy 2008-2022", <http://extwprlegs1.fao.org/docs/pdf/jor153874.pdf>

4. Surface water is efficiently stored and utilized.
5. Treated wastewater effluent is efficiently and cost-effectively used.
6. Groundwater management plans to ensure safe yield are operational.
7. The concept of utilizing greywater and rainwater is fully embedded in the codes and requirements of buildings.
8. Our shared water rights are protected.

Institutional reform

1. Water law is enacted and enforced.
2. Strong policy development and water resource planning strategies and capabilities forged.
3. Governance functions and operational functions are separated.
4. "Wholesale" operations (national infrastructure) and "retail" operations (service delivery) are separated.
5. A Water Council is operational allowing for broad stakeholder input into water management.
6. A Water Regulatory Commission of Jordan is established.
7. Commercial principles drive water management while the needs of the poor are supported.
8. Staff are trained, number of staff is optimized, conflicts of interests are eliminated, and a dynamic working environment is created that is responsive to the needs of the sector.
9. The National Water Master Plan is institutionalized

Water for irrigation

1. The annual water allocation for irrigation in the Jordan Valley will be reduced to 661 MCM in 2022 (293 MCM in 2007) and in the Highlands reduced to 191 MCM in 2022 (304 MCM in 2007).
2. Efficient bulk water distribution as well as efficient on-farm irrigation systems are established.
3. All treated wastewater generated will be used for activities that demonstrate the highest financial and social return including irrigation and other non-potable uses.
4. Jordan will have one service provider for irrigation water for the whole country, whereas the retail function for irrigation water will be privatized and/or handled by empowered farmers' associations.
5. Appropriate water tariffs and incentives will be introduced in order to promote water efficiency in irrigation and higher economic returns for irrigated agricultural products.
6. Alternative tech

Wastewater

1. All the major cities and small towns in Jordan are provided with adequate wastewater collection and treatment facilities.
2. All major industries and mines have wastewater treatment plants.
3. New high-rise buildings use greywater for internal non-drinking purposes.
4. Public health and the environment, in particular groundwater aquifers, are protected from contaminated wastewater in the areas surrounding wastewater treatment plants.
5. Treated wastewater is used for activities that provide the highest return to the economy. For irrigation use in the Jordan Valley and in the Highlands, a comprehensive risk management system is in place.
6. The quality of treated wastewater from all municipal and industrial wastewater treatment plants meets national standards and is monitored regularly.
7. Tariffs for wastewater collection are rationalized.
8. All treatment plants are operated according to international standards and our manpower is trained accordingly.

Alternative water resources

1. Treated wastewater will be used for the activity that provides the highest social and economic return and standards for use in agriculture will be introduced and reinforced.
2. Desalination projects at the Red Sea are operational
3. Rainwater harvesting is encouraged and promoted.
4. Infrastructure for desalination of sea and brackish water is sufficient.

5. An alternative energy source to keep the cost of desalination as low as possible is available.

Water Sector Green Growth National Action Plan (2021-2025)²³¹

The Water Sector Green Growth Action National Action Plan 2021-2025 (GG-NAP) outlines a green growth framework and actions for the sector aligned with the National Green Growth Plan (NGGP), Jordan Vision 2025, and Nationally Determined Contributions (NDCs) under the Paris agreement. At the heart of the green growth approach lies the leveraging of the sector's resilience through economic growth that is environmentally sustainable and socially inclusive.

The GG-NAP outlines five national green growth objectives on which the Water Sector GG-NAP was developed:

1. Enhance Natural Capital
2. Sustainable Economic Growth
3. Social Development and Poverty Reduction
4. Resource Efficiency
5. Climate Change Adaptation and Mitigation

From these five national objectives, the Water Sector GG-NAP identifies 16 sector sub-objectives that serve to mainstream the overarching green growth objectives into water sector policies and investments:

Enhanced Natural Capital

- a. Augmenting water supply for priority economic activities through decentralized infrastructure solutions, such as rain water harvesting (RWH) or reclaimed wastewater;
- b. Ensuring a reliable supply of water to protect and restore critical water-related ecosystems, including forests, wetlands, rivers, aquifers, and lakes;
- c. Improving the quality of surface and ground water by enforcing laws to prevent dumping/pollution, and/or offering incentives for clean-ups/restoration.

Sustainable Economic Growth

- a. Introducing demand management measures such as efficiency improvements, loss reduction, water reallocation, and incentive structures to save/conservate water;
- b. Strengthening the capacity of the public sector in managing water sustainably and efficiently;
- c. Improving the sector's financial sustainability through measures including NRW reduction, revised water tariffs, innovative and market based-business models etc.;

Social Development and Poverty Reduction.

- a. Ensuring equitable, reliable, and affordable access to clean water and sanitation services for all;
- b. Building resilience to climate-change related water challenges among vulnerable groups;
- c. Supporting and strengthening the participation of local communities, women, and marginalized groups in improving water management.

Resource Efficiency

- a. Increasing water-use efficiency across all sectors including agriculture, industries, and municipal sectors;
- b. Reducing water losses and leakages in municipal water services and in conveyance systems to improve their efficiency in delivery;
- c. Improving EE in water operations such as water and WWT and pumping systems;
- d. Increasing the quantity of water and wastewater treated for further recycling and reuse.

²³¹ Ministry of Environment (2020), "Water Sector Green Growth National Action Plan 2021-2025": https://gggi.org/site/assets/uploads/2020/10/20022_Jordan_Water_v03_HL_Web.pdf

Climate Change Adaptation and Mitigation

- a. Improve drought resilience by expanding decentralized supply and introducing demand management measures across sectors;
- b. Improve flood resilience through flood risk management measures, through appropriate flood mitigation infrastructure and measures to respond effectively to floods;
- c. Reducing GHG emissions in the water sector through use of RE and EE in water production and distribution systems.

A2.2.7 Tourism

Tourism Sector Green Growth National Action Plan (2021-2025)²³²

The Tourism Sector Green Growth National Action Plan 2021-2025 (GG-NAP) outlines a green growth framework and actions for the sector aligned with the National Green Growth Plan (NGGP), Jordan Vision 2025, and Nationally Determined Contributions (NDCs) under the Paris agreement. At the heart of the green growth approach lies the leveraging of the sector's resilience through economic growth that is environmentally sustainable and socially inclusive.

The GG-NAP outlines five national green growth objectives on which the Tourism Sector GG-NAP was developed:

1. Enhance Natural Capital
2. Sustainable Economic Growth
3. Social Development and Poverty Reduction
4. Resource Efficiency
5. Climate Change Adaptation and Mitigation

From these five national objectives, the Tourism Sector GG-NAP identifies 18 sector sub-objectives that serve to mainstream the overarching green growth objectives into tourism sector policies and investments:

Enhanced Natural Capital

- a. Increase public awareness about the value of natural resources and the environment through tourism sector activities
- b. Strengthen availability of data around environmental issues and mainstream the environment into the tourism sector's development planning and management
- c. Reduce the negative impacts of the tourism sector on the natural environment (including biodiversity and at natural heritage sites)
- d. Improve the quantity and quality of nature-based tourism products and services

Sustainable Economic Growth

- a. Improve the attractiveness of tourism in Jordan to investors and tourists (foreign and domestic)
- b. Increase the overall return on tourism sector investments by increasing the quantity and quality of tourism products and services, and enhance innovation in service provision
- c. Increase the capacity of tourism sector decision makers in government private sector to integrate green growth principles into their policies and business models
- d. Increase the quantity and quality of critical tourism sector services, including transport and waste management services

Social Development and Poverty Reduction

- a. Develop green job opportunities in the tourism sector for all, especially women and youth
- b. Ensure inclusion of local communities, NGOs and civil society in tourism development planning and business activities

²³² Ministry of Environment (2020), "Tourism Sector Green Growth National Action Plan 2021-2025": https://gggi.org/site/assets/uploads/2020/10/20022_Jordan_Tourism_v03_HL_Web.pdf

- c. Increase access to education and training for the tourism sector, emphasizing service quality, professionalism, and soft skills
- d. Increase access to finance and business development support for MSMEs in the tourism sector

Resource Efficiency

- a. Increase the efficiency of water and energy use in the tourism and hospitality sectors
- b. Promote integrated waste management practices in the tourism and hospitality sectors, with emphasis on reduce, reuse and recycling
- c. Increase the use of more energy-efficient technology for tourism-related transport

Climate Change Adaptation and Mitigation

- a. Enhance the resilience of critical infrastructure in key tourism areas to natural hazards and climate-related risks
- b. Improve the effectiveness of processes and systems to protect tourists from natural hazards and climate-related risks
- c. Increase the resilience of the tourism sector

A2.2.8 Sectoral mapping for the LTS

In order to mainstream the LTS vision into sectoral plans and policies, it is recommended that the vision is reflected in a sectoral structure in the document. This could be done via the vision being framed as a set of ‘pillars’ or ‘principles’ which are then applied to or interpreted for each sector. Different countries use different sectoral structures depending on their national priorities, including a mixture of emission sectors (e.g. UNFCCC-based) and economic sectors, plus some also include sectors assessed for vulnerabilities. Table 11 below identifies the sectoral structures used in recent climate reports in Jordan. Note that Jordan Vision 2025 is structured around a set of pillars (Citizens, Society, Business, Government) which are better suited as cross-cutting elements.

Table 11: Jordan's existing sectoral structures in climate-related reporting

GG-NAPs	Standalone strategies ²³³	NC3	BUR1	NAP	INDC Action sectors	NDC priority action sectors
Agriculture Sector GG-NAP	National Agricultural Development Strategy	Agriculture & LULUCF sector (Mitigation) Agriculture sector (Adaptation)	AFOLU sector	Agriculture	Agriculture & food security sector	Agriculture sector
Energy Sector GG-NAP	National Energy sector strategy	Energy sector (incl primary Energy, E. Efficiency, Renewable E.)	Energy sector (incl primary Energy, E. Efficiency, Renewable E.)	-	Energy sector	Energy sector
Tourism Sector GG-NAP		-		-	-	-
Transport Sector GG-NAP	Long-term National Transport Strategy	Transport (as part of Energy sector)	Transportation (as part of Energy sector)	-	Transport sector	Transport sector
Waste Sector GG-NAP	National Municipal Solid Waste Management Strategy Decentralized Wastewater Management Policy	Waste sector	Waste sector	-	Waste management sector	-

²³³ Those included in the review in this document (in section 6.1 & 6.2)

Water Sector GG-NAP	National Water Strategy Water for Life Water Substitution and Re-Use Policy	Water sector (Adaptation)	-	Water	Water sector (Mitigation & Adaptation)	Water sector
-	National Strategy and Action Plan for Sustainable Consumption and Production	Industrial sector (mitigation)	IPPU sector	-	Industries sector	-
-		Health sector (Adaptation)		Health	Health sector (Adaptation)	Health sector
-		Biodiversity (Adaptation)	-	Ecosystems and biodiversity (<i>incl. forestry</i>)	Biodiversity, ecosystems & protected areas	-
-			-	Socioeconomic	Sustainable development socioeconomic	-
-		Urban areas (Adaptation)	-	Urban sector	-	-
-		Coastal areas (Adaptation)	-	-	-	-

Based on the above, it is recommended that the below structure be adopted **as the starting point** for a sectoral-framework for the LTS visions, goals and structure, and mainstreaming into and with sectoral strategies. Note that Urban environment and Tourism are included due to their presence within key strategies but could be considered cross-cutting sectors given the overlap with other areas e.g. energy, transport etc.

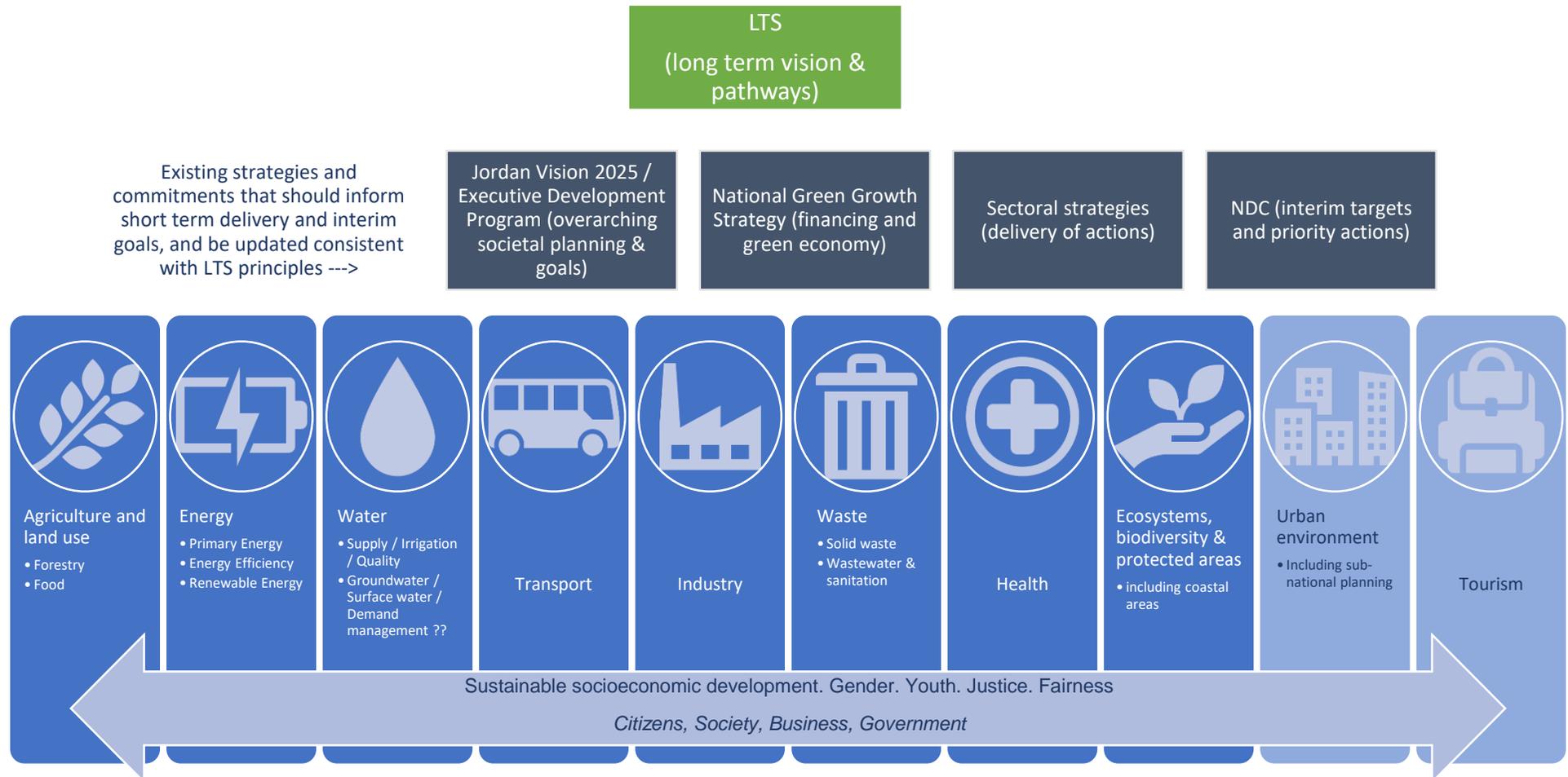


Figure 15: Suggested sectoral structure for the LTS.

Source: Developed by Ricardo Energy and Environment

A2.3 Summary of cross-cutting issues and priorities

This section sets out some of Jordan's key strategies and responses on selected key cross-cutting issues and priorities, including COVID-19 pandemic, Gender and inclusivity, and Sustainable Development Goals (SDGs).

Note that Gender will also be covered in more detail as a separate task under the roadmap development.

A2.3.1 COVID-19

COVID-19 is burdening the government and the people of Jordan. The economy was suffering from high debt and COVID-19 is making things worse. Industrial plants and businesses are closing and the government is seeking loans. The government is busy trying to deal with increased cases and deaths, plus increasing rate of unemployment and poverty. This means at present, there is “no time for long term future planning” (for example, the budget of the new government has not been approved nor the EDP is published).

Selected reports and responses have been published on specific impacts of Covid-19 on Jordan – these are summarised below:

'The Impact of the COVID-19 Pandemic on Enterprises in Jordan'²³⁴

The COVID-19 pandemic and its socio-economic impacts in Jordan are evolving rapidly, the impact not only driven and shaped by the repercussions of the spread of the virus on the broader economy, but also by the nature of the government response – movement restrictions and other emergency measures – and the support of Jordan's key development partners. In order to take appropriate mitigation measures or to adjust existing emergency measures, a good understanding of who is impacted, how and for what duration is crucial. Such an understanding is also key for effective measures, so essential given Jordan's limited fiscal space.

The ILO and UNDP report sought to do this through a rapid assessment on the impact of COVID-19 on enterprises in Jordan. The assessment is aimed at providing evidence relevant for policy and programming purposes and support the development of sound measures in order to mitigate the effects of the pandemic on enterprises and workers.

In April 2020, ILO and UNDP in collaboration with Fafo conducted a sample survey of 1,190 enterprises (home-based businesses, micro and small businesses, as well as larger enterprises). The sample of enterprises consisted of manufacturers (38%), enterprises operating in wholesale and retail trade (11%), mining and quarrying (10%) and accommodation and food services (10%), while the remaining 31% of enterprises were spread across several sectors.

Key findings of the report

- All surveyed enterprises reported challenges in terms of cash flow, reduced demand and supply, and disruption in the value chains as a result of measures responding to COVID-19.
- Only 7% of surveyed enterprises reported operating as usual at the time of the survey. 39% were operating but with either reduced staff (7%) or reduced working hours (16%) or both (16%). 51% of the surveyed enterprises had closed temporarily.
- 42% of enterprises indicated that they would be able to continue paying salaries to all workers under existing conditions for less than one month, another 42% for less than three months. Micro businesses (55%) and small enterprises (44%) indicated that they lacked the means to keep paying salaries, while medium (33%) and larger enterprises (23%) were more likely to be able to pay salaries for an additional month. Around a quarter (26%) of enterprises indicated

²³⁴ ILO and UNDP (2020), “Impact of the COVID-19 pandemic on enterprises in Jordan”: https://www.ilo.org/wcmsp5/groups/public/---arabstates/---ro-beirut/documents/publication/wcms_749136.pdf

that under the conditions at the time of the survey they would be able to stay operational for less than a month, 30% would be able to remain operational for 1 to 3 months, 5% for 4 to 6 months and only 13% for more than six months. A substantial number of them (27%) did not know how long their businesses would last if the situation prevailing at the time of the survey would continue.

- The vast majority of employees who were not able to come to work due to the lockdown were still receiving full or partial payments from their employers. 71% of the employees not able to come to work were still receiving full payments, while 20% were receiving partial payments. More employees not able to come to work in large enterprises were receiving full payments compared to employees in small enterprises.
- Nearly 40% of the surveyed enterprises stopped payment to social security as a result of the COVID-19 crisis, making use of the waiver introduced in Defense Order 1. A larger share of small enterprises stopped payments compared to larger enterprises. While 45% of the micro enterprises have stopped their payments, only 34% of the enterprises with more than 100 employees have done so.
- Over one-half of the respondents (52%) remained confident that they would weather the crisis and resume profitability, while 20% were not confident of their economic resilience and robustness. However, asked about their pre-crisis financial situation, 25% of all enterprises indicated that they were losing money and 46% reported only breaking even, suggesting that many enterprises had financial difficulties even before the lockdown measures. Apprehension is higher amongst home-based and micro enterprises.
- The ability for enterprises to survive the economic crisis will depend on multiple factors, including how agile enterprises are in ensuring business continuity and adapting their business processes. Yet only 25% of enterprises had a business continuity plan in place.
- In terms of measures taken to reduce the spread of COVID-19 at the workplace, more than 72% of surveyed enterprises reported that they had disseminated protective gear, including masks and gloves to employees, and 55% had enhanced cleaning and sanitizing efforts across facilities at the time of the survey. 23% of micro businesses had not yet taken any measures.
- At the end of April, two-thirds (67%) of all enterprises were not aware of any support packages or measures available to help them mitigate the impact of the crisis.
- 53% of businesses consider direct financial support as the most essential support needed to cope with the situation at this stage, with 60% of micro businesses and 43% of enterprises with more than 100 workers indicating the need for such support.
- 42% of all enterprises surveyed, and 68% amongst companies with more than 100 workers, suggested wage subsidies, as essential to cope with the situation. 20% of all enterprises mentioned access to credit.

'Jordan Food Security Update: Implications of COVID-19'²³⁵

While the government in Jordan maintained its efforts to keep COVID-19 pandemic spread under control, the pressure on food security has increased in Jordan as COVID-19 spillover effects expose structural challenges in the economy. Among Jordanians, 53 % are vulnerable to food insecurity—corresponding to around 3 million individuals— and around 3 % (219 186 Jordanians) of households are

²³⁵ World Bank *et al.* (2020), "Jordan Food Security Update: Implications of COVID-19": https://docs.wfp.org/api/documents/WFP-0000122056/download/?_ga=2.127815437.1606268654.1611058242-1458411177.1611058242

food insecure. Among all governorates, rural governorates are most susceptible to food insecurity, with Al-Tafilah by far the most food insecure region with 20 % of households being food insecure.

With an economy already in crisis, COVID-19 has pushed 17 % of Jordanians to permanently lose their jobs with unemployment skyrocketing to 26 % in 2020. This is leading Jordanian households to adopt livelihood-coping strategies to adapt to food insecurity. Up to 42 % of households are resorting to harmful livelihood coping strategies (crisis or emergency level) to address essential needs, compromising future household coping and productive capacities. While the vast majority among Jordanian households show an acceptable food consumption (96 %), the economic impact of the COVID-19 pandemic has forced households to economize with food, with 55 % of household using consumption-based coping strategies (as compared to 34 % in 2014).

The food insecurity extends to the refugee community, as Jordan hosts one of the highest numbers of refugees globally. Data from July/August 2020 show that 21 % of refugee households in host communities are food insecure, corresponding to 131 613 individuals. These households have extreme food consumption gaps or rely on potentially irreversible coping strategies that will compromise future household productivity. Another 67 % of households are vulnerable to food insecurity, equivalent to 417 293 individuals. Only 12 % are food secure.

The Jordanian economy continues to be under stress from the unfolding implications of COVID-19. While the Jordanian government has introduced exceptional measures to protect formal sector workers, temporarily suspending some clauses of the Labour Law and introducing measures to prevent layoffs in the formal private sector, COVID-19 continued adding immense pressure on the jobs market during the second quarter of 2020. The formal sector constitutes around 56 % of employment sector, including both public (34 %) and formal private sector (22 %). This leaves 44 % of employees who work in the informal sector – and which includes most of labour in agriculture –left exposed to the shutdowns and economic crisis without any labour protections.

The latitude of government intervention, including to stabilize food security, will only become more limited. The fiscal stress will not be relieved by any economic growth and any increased government revenue, as the Jordanian private sector takes a heavy toll as the whole economic cycle falters. While the economy is opening up, only half of private sector enterprises – with a majority working on the food and beverages industry – were confident that they would weather the economic crisis resulting from COVID-19 and resume profitability.

Food and agriculture import costs are rising as Jordan seeks alternative sources for specific commodities being restricted for export, such as rice and pulses. With Jordan being highly import dependent, and with exports of key staples such as corn, wheat, and rice being highly concentrated among top-50 countries most affected by COVID-19, Jordan's food supply will only grow more volatile as a new wave of COVID-19 unfolds.

“Building Back Better” (BBB) needs to start immediately for Jordan. The government, development partners, private sector, NGOs and social enterprises need to come together to hack solutions for the implications of COVID-19 on food security at the local level. BBB measures on high priority as COVID-19 unfolds in Jordan include trade diversification, digitization, and enabling social enterprises, which can create innovative approaches to value chain efficiency and inclusion, which are greatly needed to roll back the negative implications on Jordan's food security.

Policy Recommendations

A focused policy effort towards “Building Back Better” is much needed to be integrated into a national food security and nutrition strategy for Jordan. Targeting low hanging fruits in boosting the agro-sector production, integrating digitization and entrepreneurship into agriculture, and providing a solid ground for boosting agriculture exports will help Jordan to respond the food security challenges unfolding with COVID-19.

1. Maximizing the potential contributions of Jordan's agri-food sector: Agro-food is a main source of income, employment and livelihoods for a large share of the population, especially in rural areas. The overall agri-food sector contributes to the livelihoods of about a quarter of the

population in Jordan. The sector is labour-intensive and has a relatively strong long-term value-added elasticity of employment, which is much needed as unemployment grows. For every percentage point of growth in the value added of the agriculture sector, employment can increase by 0.36 percentage points while the corresponding employment increases for 31 industry and service sectors would be 0.30 and 0.20 percentage points.

2. Agricultural transformation to boost entrepreneurship: Harnessing the power of digitization and mobilizing finance for young entrepreneurs in the agro-food sector is needed, both in rural and urban areas. The agri-food sector offers business opportunities to many small and medium investors. As agriculture is less capital intensive than many other sectors, it offers investment opportunities to small and medium scale entrepreneurs who may not be able to enter other sectors dominated by larger companies.
3. Supporting the agriculture export industry: Jordan has a significant comparative advantage for exporting high value fresh products to premium markets and there is room to expand agricultural production. The Jordan Valley, with its exceptional climate at 300 meters below sea level, is uniquely suited for production and export of early season fruits and Jordan's location, with close proximity to Arab, European and Russian markets, and year round climatic growing conditions allow Jordan to export to large nearby markets. Facilitating the adoption of quality and food safety standards and providing the necessary infrastructure (packaging facilities, cold stores and quality inspection labs) and diagnostic tools through digitization will help the Jordanian farmer increase their exports.

It is understood that the government are currently preparing the Covid-19 recovery consultancy action plan. This task came as a request from Gov. of Jordan/MoPIC to the NDC Partnership. MoPIC has identified 4 priority sectors for recovery: Tourism, Agriculture, Health and Energy. These sectors are also priorities for climate adaptation and mitigation (with the exception of health).

The first deliverable is to be a pre-assessment report to identify the current conditions and report on the economic aspects. Then they will identify recovery options and measures within the priority sectors and set action plans (medium and long term)²³⁶.

RECOMMENDATIONS/KEY FINDING

The Covid-19 pandemic has had unprecedented impacts across the world, and Jordan will need to put in place recovery plans to deal with the aftermath – including the human, societal and economic costs. The Covid-19 pandemic has also been widely acknowledged as an opportunity to initiate a shift, and 'Build Back Better' in ways that are more sustainable, resilient and lower carbon. The economic recovery strategies and wider Covid-19 recovery plans should be a critical input to the LTS process, and the LTS process and long term climate ambition should equally inform these. Identifying 'green' technologies, projects and investments that not only shift the pathway but deliver recovery objectives will provide win-wins. The MoE and LTS development team should therefore work closely with those leading Covid-recovery efforts, and the MoE should also seek to inform and input to these these at the earliest opportunity to ensure recovery plans are not supporting unsustainable actions and lock-in to pathways that are not compatible with lower carbon emissions and greater climate resilience.

At present, Covid-recovery planning is in the early stages (as the pandemic is still ongoing) so recommendations on specific interventions at this point are not possible. But the vision of the LTS can provide an opportunity to support recovery if undertaken in parallel.

²³⁶ Further details required initial information provided through a call with Eng Shatha Shareif – local consultant hired by MoPIC

A2.3.2 Gender and Inclusivity

Note that Gender will also be covered in more detail as a separate task under the roadmap development

Selected reports or sections of, on gender and climate change in Jordan are summarised below:

Rural Women and Climate Change in Jordan²³⁷

This document aims to identify and develop gender-sensitive strategies to respond to the environmental and humanitarian crises caused by climate change

In rural areas of Jordan, women are more vulnerable to the effects of climate change than men are, particularly because women constitute the majority of the poor and are dependent for their livelihoods on natural resources that are threatened by climate change. In the country, almost 9.1% of female-headed households are food insecure or vulnerable to food security, compared to 5.7% of male-headed families (DoS 2013). Furthermore, women face significant social, economic, and political barriers that negatively affect coping capacities. Women charged with the responsibility to secure water, food, and fuel for cooking and heating face the greatest challenges. When coupled with unequal access to resources, barriers to decision-making processes and limited mobility, women in rural areas are placed in a position wherein they are disproportionately affected by climate change. It is therefore of critical importance for gender-sensitive strategies to be identified and developed to respond to the environmental and humanitarian crises caused by climate change.

In the fight against climate change, the role of women as agents of change is frequently overlooked. Women are often perceived as passive members of households or indirect victims of climate change. However, it is critical to recognise the actual role of women within their communities as educators, practitioners, and influential agents of change. Empowering women to harness their leadership capacities is therefore essential. Women can inform and implement actions and strategies related to water management, energy, agriculture and food security, economic growth and livelihoods, waste management, and policymaking. In rural communities, empowering women at multiple levels to build both personal and professional skills will support the evolution of a new generation of female champions and advocates of climate change knowledge and resilience. Finally, the increased participation and leadership of women in the labour force, in entrepreneurial activities and in civil society, will enable them to gain power and influence gender and climate change policies and adaptation plans at the local and national level in Jordan.

The document makes a number of recommendations, based on:

1. Building on rural women's existing expertise and ability to communicate to develop a common understanding of key climate change processes
2. Fostering Jordanian rural women's capacities to act and make significant progress in adapting to climate change in their communities
3. Strengthening rural women's leadership capacities to advocate for gender-sensitive strategies of adaptation to climate change

Jordan 2025¹⁹⁶

Jordan 2025 has the objective of achieving a prosperous, resilient and inclusive economy while strengthening reform and inclusion.

Culture and youth are key foci of this vision, with the report highlighting the inability of Jordan's current development model to increase amount of young population in the workforce. Jordan ranks 215th out of 218 countries in level of participation in workforce, and the report notes that addressing workforce participation problem is Jordan's single biggest challenge over the next decade.

²³⁷ UN Women (2018), "Rural Women and Climate Change in Jordan":
<https://data2.unhcr.org/en/documents/details/66494>

A large part of Jordan's economic participation problems arise from gender inequality, with 65% of males economically active compared to only 15% of females. This is significantly lower than the average for the MENA region (76% of males and 27% of females), and far below the global average (77% of males and 51% of females). Furthermore, the average female wage is 67% lower than for males in all types of jobs.

Addressing these gender equality and economic participation issues is fundamental to achieving the vision set out in Jordan 2025, the basic principles of which include promoting the rule of law and equal opportunities, increasing participatory policy making, achieving fiscal sustainability and strengthening institutions.

First Voluntary National SDGs Review²¹¹

Jordan has embarked on implementing the 2030 Agenda for Sustainable Development and achieving the Sustainable Development Goals (SDGs), despite the numerous challenges Jordan is currently facing. Jordan remains determined to safeguard recent development achievements while ensuring a resilient, prosperous and inclusive economy.

Gender mainstreaming is a priority element of Jordan's First Voluntary National SDGs Review. The document concludes that the next steps for Jordan in this areas involve continuing to mainstream gender throughout all national development plans in line with the SDGs, mapping gender indicator gaps and the establishment of a gender database.

Local Climate Actions Plans

Local Climate Action Plans (Deir Alla, Busaira and Ayoun municipalities) integrate aspects of mitigation, adaptation and gender mainstreaming to strategically respond to local climate change impacts.

Climate change impacts groups of a community differently due to various reasons, such as the tasks and responsibilities they typically carry out day-to-day. The majority of studies have shown that women and girls are at greater risk from the consequences of drought, water shortages and food insecurity; however, socially constructed roles also affect men's responses to climate-related disasters; such as: men are typically the ones to be injured during natural disasters due to their time spent outdoors. On the other hand, women are also typically more restricted in terms of movement (access or availability of transport, finances, etc) which also influences people's responses and adaptive capacity.

A framework was produced to strengthen the work of municipalities and partners in the development of climate change-related interventions, programs and activities, which take into account the needs of all members of society: males and females, young people, children and adults, people with disabilities, the poor, and the marginalized. The framework consists of the following array of activities that were incorporated in Actions where possible to enhance the outcomes and improve local resilience. These activities are the result of a Gender Mainstreaming Exercise and Assessment during the Baseline Analysis phase of LCAP development, divided between sections Identification of Actions, the Implementation of the Action and the Evaluation of Actions:

Identification of Actions

- Participation of men, women, young people and persons with disabilities in discussion sessions and identifying problems, proposals and priorities
- Location and timing of meetings facilitates cultural needs (segregated rooms and/or providing childcare, location is accessible to the disabled)
- A social and gender expert is present at functions, events centered around community engagement
- Funding opportunities are unbiased
- Improving knowledge and concept of climate change and gender integration

Implementation of the Action

- Building the capacity of municipal workers in gender and women's empowerment

- Participation of male, female and youth workers in supervising and implementing Actions
- Unbiased training and responsibilities are available to all, and efforts are made to remove barriers to women's participation
- Information is transparent and easily accessible
- Securing a nursery for childcare for male and female workers, supervised by the municipality
- Media campaigns promote women's empowerment, highlighting professional and leadership capacities
- Creating suitable economic opportunities for women to improve their income, including training opportunities in non-traditional skills (such as project-related technical and technological skills); improving services and infrastructure (nursery, transportation..) to enhance women's economic participation; safeguard labor rights, particularly for those who work in agriculture; removal of barriers traditionally placed on women that compound their workload; improving women's access to reproductive health services.
- Active participation of women's associations in implementation
- Improving and developing the role of women's associations in the community from traditional roles (charity,) to more leadership, renewable and related sectors related to climate change (water, energy and health)
- Active participation of youth
- Active participation of people with disabilities

Evaluation of Actions

- Track the numbers of beneficiaries, participants and leaders/decision makers in initiatives, disaggregated by gender, age and geographical area of the municipality.
- Participation of women researchers and women's associations in data collection

RECOMMENDATIONS/KEY FINDING

Whilst gender considerations will be dealt with under a separate task in the roadmap, the above examples demonstrate both the importance of including gender considerations, and the opportunities to enhance gender equality through the LTS and climate actions. The framework above – for identification, implementation, and evaluation of gender considerations – may provide a useful tool for LTS gender mainstreaming and will be considered as part of those activities. Further, Jordan 2025 identifies that addressing gender equality and economic participation issues is fundamental to achieving that vision, and similarly, will be for the LTS.

A2.3.3 Sustainable Development Goals

Selected reports or sections of, on SDGs and climate change in Jordan are summarised below:

First Voluntary National SDGs Review²¹¹

Jordan has embarked on implementing the 2030 Agenda for Sustainable Development and achieving the Sustainable Development Goals (SDGs), despite the numerous challenges Jordan is currently facing. Jordan remains determined to safeguard recent development achievements while ensuring a resilient, prosperous and inclusive economy.

The 2017 Voluntary National SDGs report of Jordan addressed the following key SDGs: SDG1 (No Poverty), SDG2 (No Hunger), SDG3 (Good Health and Well-being), and SDG5 (Gender Equality), and SDG9 (Industry, Innovation and Infrastructure).

It has also considered other priorities for Jordan with a focus on: Education (SDG4), Water (SDG6), Energy (SDG7), Prosperity and Decent Work (SDG8), Environment and climate change (SDG13), and Justice, human rights, and participation (SDG16).

Suggestions made during this review include:

- Raising awareness of the Sustainable Development Agenda and its goals, targets, indicators and means of implementation: The draft SDG Communication Strategy, currently under development, will work to strategically address a variety of audiences including: civil society organizations, private sector, youth, women, students, academia, parliamentarians and municipal councils, using different tools including written and visual material, workshops, panel discussions, social media and simulation models.
- Prioritization and mapping of goals, targets and indicators with national planning frameworks: Conducting regular technical meetings and reviews facilitating agreement on baselines and targets for all indicators while conducting a gap analysis to identify areas of concern.
- Mainstreaming within national plans: Continuing to mainstream the SDGs in the current and future EDPs and sectoral plans, taking into consideration the economic, social and environmental elements of sustainable development and their interconnectedness.
- Mainstreaming into sub-national plans: Starting in one to two governorates selected according to clear criteria and expanding mainstreaming systematically to all governorates.
- Strengthening national statistical systems and availability of data: Providing technical support to the Department of Statistics (DOS) to ensure the availability of missing data from DOS or other data providers and robust quality control mechanisms.
- Gender mainstreaming: Continuing to mainstream gender throughout all national development plans in line with the SDGs, mapping of gender indicator gaps and the establishment of a gender database.
- Further strengthening of institutional mechanisms: Continuing to adopt an efficient framework that ensures everyone's involvement in planning, implementing, and monitoring of development.
- SDG Costing: Developing a mathematical model based on the existing situation and future projections to calculate the cost of achieving the SDGs in line with national priorities. This would require technical support for the establishment of such models.
- Financing: ensure adequate domestic and external funding to maximize the achievement of the SDGs,
- Enhancing monitoring and evaluation systems through the establishment of a national monitoring system and dashboard on SDG indicators and achievement available for all on the Ministry of Planning and International Cooperation's website. Preparation of annual progress reports and national progress reports every four years.
- Developing capacity in planning, mainstreaming and localizing the SDGs, including the inclusion of gender mainstreaming, in addition to strengthening the national statistical system, monitoring and evaluation systems and report drafting.

RECOMMENDATIONS/KEY FINDING

As noted in section A2.1.2, SDGs are key in the governmental planning process and so the review findings are critical to take into account in the LTS vision. Although not explicitly including a 'vision' or goal, the mainstreaming of SDGs throughout and the explicit reference to them in the LTS is critical.

There is a unit for monitoring SDGs indicators at MoPIC supported by DOS, which is proving successful in terms of performance tracking. LTS formulation should for sure align with this unit and the SDGs indicators should be in harmony with the LTS KPIs.

A3 Summary of Jordan's climate change response

As requested in the ToR, this section provides a summary of Jordan's climate change response to date. This is important context and reference for the development of the LTS

Jordan signed the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, ratified it in 1993 and acceded to the Kyoto Protocol as non-Annex-I country in 2003. It signed the Paris Agreement on climate change in April 2016 and ratified the agreement in November 2016 with entry into force in December 2016.

Jordan was the first Non-Annex I country to produce an Initial National Communication (INC) and has been an active member in almost all Climate Change and other UN Conventions' global treaties, partnerships and programmes. Jordan has prepared the following climate strategies, communications to the UNFCCC, and action plans:

- Initial National Communication (1998)
- Second National Communication (2009)
- Third National Communication (2014)
- National Strategy and Action Plan to Combat Desertification (2015-2020)
- National Climate Change Policy and Sector Strategic Guidance Framework (2013-2020) (work is undergoing by UNDP to update the policy)
- Climate Change Policy for a Resilient Water Sector (2016)
- Intended Nationally Determined Contribution (INDC) 2015, submitted as its First NDC in November 2016 (should be updated within this year)
- A National Green Growth Plan for Jordan (2017) and 6 Green Growth Action Plans: water, energy, transport, tourism, agriculture and waste (2021-2024).
- Biennial Update Report 1 (2017)

In addition, the BUR2 has been prepared but is not formally submitted to the UNFCCC. The National Adaptation Plan (NAP) is in draft and not yet approved, and the NDC is under revision currently.

As a Non-Annex I country, Jordan's strategy is to join several groups to empower its negotiation position. Jordan is a member within three groups: Arab Group, G77 and China and The Like Minded-Group of Developing Countries (LMDC). Jordan only supports any request that is in line with national climate goals/priorities, namely: **focus on adaptation, equal but differentiated responsibilities, receiving support on transparency and technology transfer**²³⁸.

A3.1 Transparency and Reporting: GHG emissions

At the national level all mitigation analysis activities have been part of National Communications or Biennial Update Reports (BURs), undertaken through projects. These include, as before:

- Initial National Communication – NC1 (1998)
- Second National Communication – NC2 (2009)
- Third National Communication – NC3 (2014)
- National Climate Change Policy and Sector Strategic Guidance Framework (2013-2020) (Work is currently ongoing by UNDP to update the policy – GHG mitigation analysis within the policy was based on NC1 and NC2)
- Intended Nationally Determined Contribution (INDC) 2015, submitted as its First NDC in November 2016 – the GHG mitigation analysis within the policy was based on TNC (note that the NDC should be updated in 2021)

²³⁸ Belal Shqarin – MoEnv

- Biennial Update Report 1 – BUR1 (2017) – note that the BUR2 is currently being finalized for submission in 2021

A3.1.1 Jordan’s mitigation reporting

There is no specific national mitigation plan so far: Nevertheless, Jordan has identified a number of mitigation measures, specified through sectoral authorities to achieve the national development priorities such as the measures specified in Jordan2025, Vision and Strategy.

The NDC is the only national document that specifies a mitigation target for a specific timeline: However, no new analysis was carried out in the development of the NDC, which utilised analysis from the NC3.

The BURs and National Communications include baseline and mitigation scenarios which could be used as a base for national mitigation planning.

- **The Second BUR has been recently developed** but is not yet published (as of February 2021). This includes the national GHG inventory for the year 2016 and an update to the measures included in the BUR1.
- **The development of the Fourth National Communication Report (NC4) is due to start in the first quarter of 2021**, which will include the national GHG inventory for the year 2017. In addition, the baseline scenario and mitigation scenario will be updated for the period (2016-2066). The vulnerability assessment and projections will be updated.
- **The last GHG inventory was undertaken during 2020 for the BUR2**, for the year 2016, and will be submitted to the UNFCCC Secretariat soon. To date, GHG inventories have been calculated for the years: 2000, 2006, 2010, 2012 and 2016.

RECOMMENDATION

Mitigation projections and GHG data for the LTS should be aligned to the latest updates – which will likely be those carried out for the NC4, to be started soon.

Table 12: Jordan’s GHG emissions (2016) - unpublished

Sector	2016	
	% of total emissions	Emissions (Gg CO ₂ eq)
Energy	76.0%	23649.47
IPPU	10%	3177.42
AFOLU	1.38%	428.71
Waste	12%	3807.73
Total	100%	31063.32

Jordan 2016 GHG emissions profile BUR2 (unpublished)

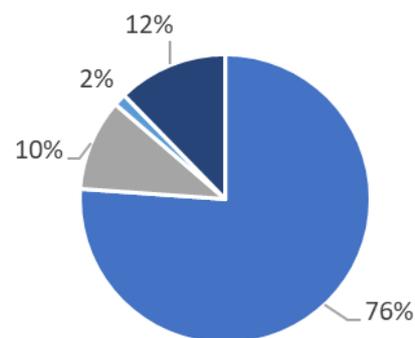


Figure 16: Jordan's GHG emissions (2016) - unpublished

■ Energy ■ IPPU ■ AFOLU ■ Waste

Table 13: BUR2 timeseries emissions data

Categories/Years	2000	2006	2010	2012	2016
	Gg CO ₂ eq				
Total National Emissions and Removals	14,827.61	19,779.8	23,170.94	28,110.71	31,063.32
1 - Energy	14,016.09	18,508.44	19,260.38*	22,823.63*	23,649.47
2 - Industrial Processes and Product Use	NE**	NE**	1,776.09*	3,144.71*	3,177.42
3 - Agriculture, Forestry, and Other Land Use	NE**	NE**	180.5	237.29	428.71
4 - Waste	811.52	1,271.36	1,567.49	1,635.14	3,807.73
Memo Items (5)					
International Bunkers	523.53	905.40	1,078.11	1,110.02	4,320.36
1.A.3.a.i - International Aviation (International Bunkers)	519.04	734.85	1,016.41	1,044.24	3,394.73
1.A.3.d.i - International water-borne navigation (International bunkers)	4.49	162.49	52.2602	56.0552	925.63
1.A.5.c - Multilateral Operations	NO	NO	NO	NO	NO

* These categories have been recalculated

** These categories were not estimated (they will be estimated as part of the third BUR)

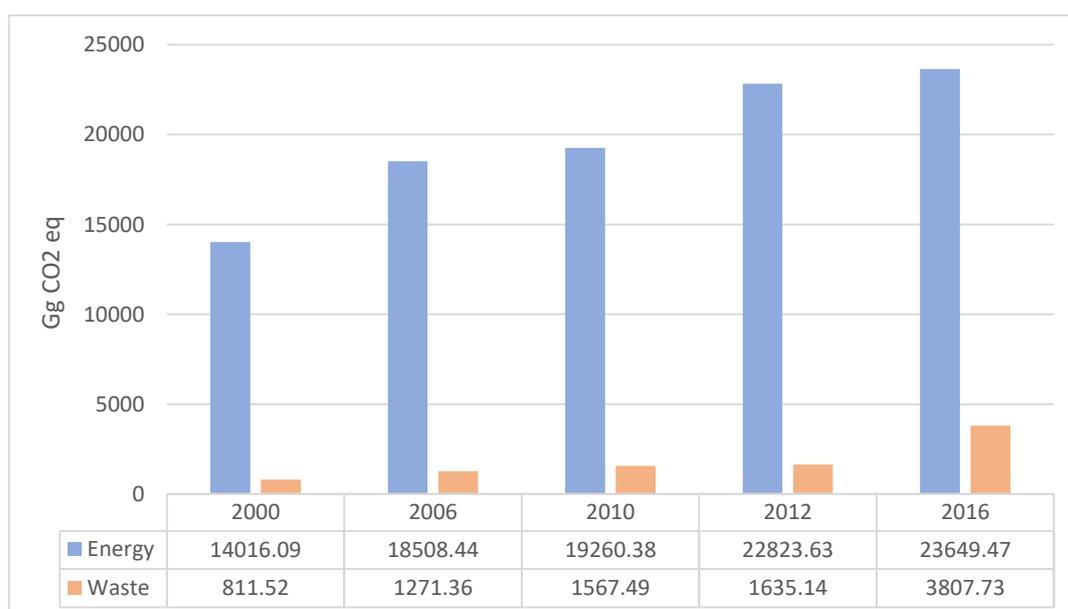


Figure 17: BUR2 timeseries emissions data for Energy and Waste sectors

Source: Developed by Ricardo Energy and Environment

KEY FINDING:

The above figure illustrates a comparison between the energy and waste sectors for the years of 2000, 2006, 2010, 2012, and 2016. There is a normal trend of increase through the various years that could be attributed to population increase and economic growth.

According to the Second BUR, the energy sector is still the major emitter sector with the following breakdown, shown in Table 14 (NOT YET PUBLISHED FORMALLY).

Table 14: Energy sector emissions (2016) - unpublished

Sector	2016	
	Total emissions (Gg CO ₂ eq)	% of total
ENERGY SECTOR	23054.59	100%
1A Fuel Combustion Activities	23032.67	98.0%
1A1 Energy Industries sub-sector	8956.12	37%
1A2 Manufacturing Industries and Construction sub-sector	2432.06	8%
1A3 Transport sub-sector	8609.48	38%
1A4 Other Sectors (Residential, Commercial, and Agriculture) sub-sector	2354.95	12%
1A5 Non-Specified (Fuels used by the military) sub-sector	680.06	3%
1B Fugitive emissions (Oil and Natural Gas)	21.92	2%

The most recent published emission projections for Jordan are still those from the BUR1 (2017), shown in Table 15. At present, this serves as an indicator, but there will be a lot of changes when the projections are updated as part of the NC4, during 2021-22, since the Ministry of Energy issued a new energy strategy for the period 2020- 2030 with many changes – more below.

In contrast for example, the NC3 projections (the basis of the NDC) show both a considerably higher baseline and mitigation scenario. Table 15 below summarises the main features of the two sets of projections and their usage.

Table 15: BUR1 emissions projections (2017)

Year	Baseline Scenario	Mitigation Scenario	Avoided	Cumulative Reduction
	MtCO₂ Equivalent			
2020	34.33	31.65	2.68	4.95
2025	31.45	27.44	4.01	7.85
2030	38.18	33.64	4.53	9.46
2035	40.99	38.07	2.92	5.96
2040	45.56	40.73	4.83	9.32

Table 16: NC3 emissions projections (2014)

Year	Baseline Scenario	Mitigation Scenario	Avoided	Reduction %
	MtCO₂ Equivalent			
2020	38.15	34.61	3.54	9.3
2025	39.34	34.51	4.84	12.3
2030	51.03	46.01	5.02	9.8
2035	57.08	52.11	4.98	8.7
2040	61.57	56.39	5.16	8.4

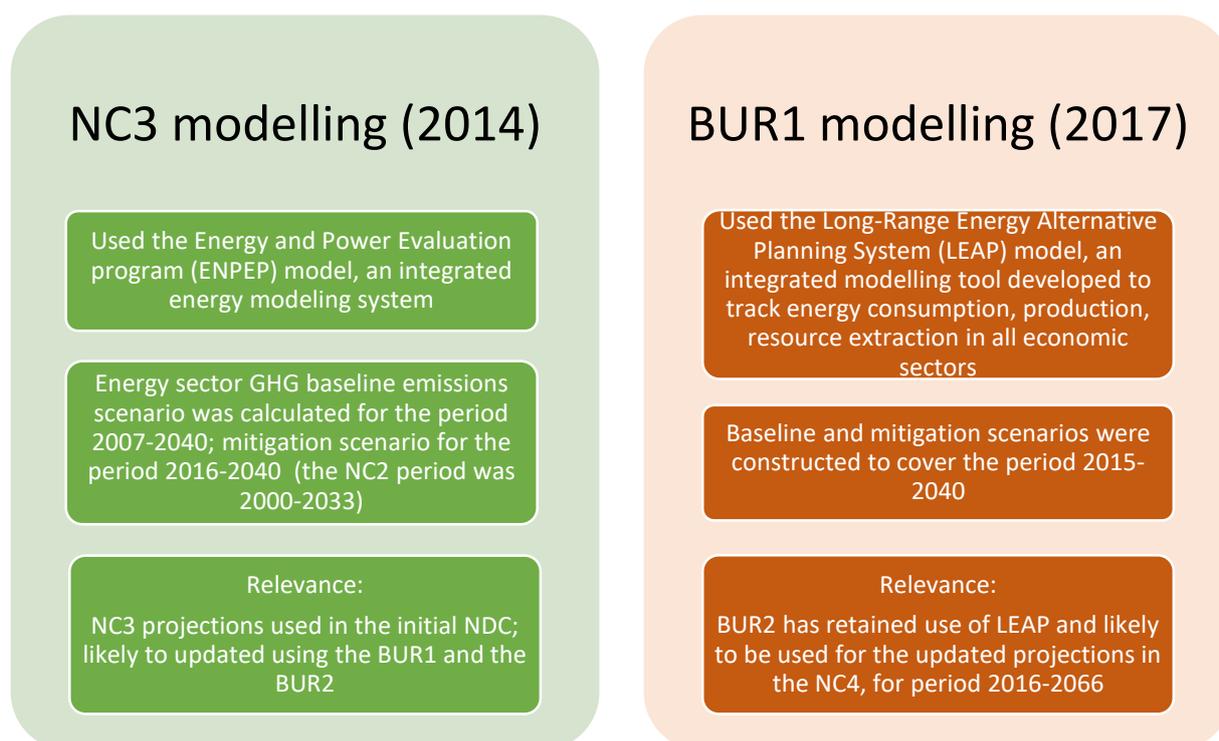


Figure 18: Summary of modelling utilised in Jordan

Source: Developed by Ricardo Energy and Environment

The First BUR includes in APPENDIX A all the mitigation analysis data (for the base year 2015) for the sectoral baseline scenario for the period (2015-2040) and the final GHG mitigation scenario for the period (2016-2040). The energy baseline scenario delineated 2015 as a base year and considers the policies, programs, and projects that had been incorporated in the energy strategy for 2015-2025 as committed and confirmed inputs for building up the baseline scenario up to 2040 using LEAP model. For non-energy sectors (IPPU, AFOLU, and Waste) linkages to demographic, macroeconomic, and other sector specific factors were used to build up the scenario utilizing statistical and economic tools.

The Fourth National Communication (which is expected to be ready by the end of 2021 or 2022) will include a specific chapter for updating the GHG mitigation analysis.

A number of data challenges were faced in the compilation of the GHG emissions inventory, baseline, and mitigation scenarios which are still present in Jordan and will need to be considered in the planning of future activities. These can be summarized as follows:

- Gaps in time series (no complete time series in some sub-sectors)
- Inconsistency and different classifications at data sources and different units
- Poor coordination in providing the required data

- No coordination with the private sector to provide the required data

The new Energy Strategy was approved by the Ministerial Council in March 2020 together with a framework implementation plan. This will have big impacts on future modelling, as the new energy strategy re-estimated the annual growth rate of the primary energy demand for the period 2020-2030 to be 0.9%, and the annual growth rate of the electricity demand for the same period to be 1.1% compared to 2.4% and 4.1% for primary energy demand and electricity demand respectively considered in the previous energy strategy (2015-2025). Table 17 illustrates the comparison of the electricity demand in GWh between the two strategies.

Table 17: Comparison of electricity demand within the two energy strategies

Years	2020	2023	2025	2030
Energy Strategy 2020-2030	17,672	17,950	18,686	19,701
Energy Strategy 2015-2025	23,150	26,470	28,900	34,990

The new strategy aims to achieve energy security for the country and to increase the contribution of the local resources in the energy mix. It also aims to decrease the heavy burden of the energy cost on the national economy and to study the impacts of renewable energy projects on the electricity generation system. Considering the above mentioned issues and facts, and according to the previous energy strategy 2015-2025 and the new energy strategy 2020-2030 with their components and the implementation plans; the most probable baseline scenario in the energy sector will be based on the adopted goals, policies, and laws, and the planned and committed projects within the energy strategies.

The Field of Renewable Energy:

The main policy: utilizing the renewable energy resources to generate electricity.

In light of the large progress in utilizing the renewable energy resources to generate electricity, the total capacity of the constructed, under construction and committed projects during the period 2020-2023 will reach 2400 MW as illustrated earlier. Considering the NEPCO situation, the total new capacity of wind and solar energy to be added to the system during the period 2024-2030 will be 600 MW of which 400 MW will be wheeling and net metering systems.

The Field of Oil Shale:

The main policy: utilizing the oil shale resources to generate electricity and produce oil.

- Oil shale projects for electricity generation
Due to the over-committed generating capacity in terms of MW, the second direct burning of oil shale project for electricity generation will be considered in the year 2028.
- Oil shale projects for extraction of oil shale

All oil shale companies were asked to postpone the development period, and some of the oil shale companies have closed their businesses. Oil shale companies that asked for development period extension were Jordan Oil Shale Company (JOSCO) which was intending to produce 20,000 barrels of oil shale in 2025, Jordan Oil Shale Energy Company (JOSE) intending to produce 20,000 barrels/day in 2025, Karak International Oil Company (KIO) intending to produce 25,000 barrels/day in 2024, and Saudi Arabian Corp for Oil Shale (SACOS) intending to produce 20,000 barrels/day in 2025.

The Field of Nuclear Energy

Considering the over committed generating capacity in terms of MW, in the national electric system, introducing nuclear energy as an alternative for electricity generation will be considered after the year 2030. The Atomic Energy Commission is conducting a study to find the best technology to construct small nuclear reactors in several locations in Jordan territory, from two to six units with a capacity of 110 MW for each unit.

KEY FINDING / RECOMMENDATION

Jordan's mitigation scenarios to date are set to achieve only a small reduction on the BAU scenario and are projecting an increase in net emissions over the period. This is not compatible with either the scientific consensus on the need to deliver net reductions in emissions to avoid dangerous climate change, even in a 'peak-plateau-decline type scenario, and falls far short of the reductions required for a 'net zero' 2050 pathway. Jordan therefore needs to both significantly increase its mitigation efforts, particularly if the LTS vision intends to embrace a net zero 2050 goal, and undertake updated modelling to achieve this.

Secondly, it is expected that the new NC4 mitigation analysis – likely undertaken using LEAP – will supersede previous analyses and be the basis for national future emissions reporting and planning. This modelling is expected to go beyond 2050 (to 2066). Jordan will need to take a decision about alignment of these tasks.

Thirdly, the new Energy Strategy has revised upwards the projections of future energy demand, and also prioritised fuels such as oil shale which will not be compatible with a low / zero carbon pathway in the long term. This will have implications for identifying and achieving a pathway for low carbon energy beyond 2030.

The report on the role of modelling in an LTS will provide further recommendations on the options and approaches, and the role of modelling in supporting net zero visions.

A3.1.2 Jordan's First NDC

Jordan officially submitted its first NDC on 04 November 2016, approximately a year after the Paris Agreement was adopted. Jordan's NDC contains mitigation and adaptation components as the key pillars of its contribution.

Jordan's NDC document is the only national document with climate change specific goals and targets.

In year 2015, Jordan nationally determines to reduce its greenhouse gas emissions by a bulk of 14 % until 2030. This contribution of GHGs reduction will be unconditionally fulfilled at, maximally, 1.5 % by the Country's own means compared to a business as usual scenario level. And the conditional outcome target is aiming at reducing Jordan's GHGs emissions by 12.5 % by 2030. The overall mitigation target was calculated as the reduction outcome of implementing 70 projects consist of +-43 sectoral projects resulted from the mitigation scenario assessment articulated in the 2014 Third National Communication Report to UNFCCC in addition to another 27 sectoral priority projects proposed after the development of the TNC as the outcomes of the successive meetings were held with the stakeholder during the process of INDC development.

Jordan's NDC assures the fact that it was tailored under the guidance of the overarching national Climate Change Policy of Jordan 2013-2020 which encompassed the national strategic objectives and measures for mitigation and adaptation.

The bottom-up approach was adopted in developing Jordan's nationally determined contributions (NDC) by shedding light on the extraordinary efforts of the country before 2020 in mainstreaming the climate change impacts and measures in several national strategy such as National Strategy and Action Plan to Combat Desertification (2015-2020) and the National Biodiversity Strategy and Action Plan (2015-2020). The INDC document also mentioned the National Green Growth Plan which was in that time still under development (Year of submitting the INDC).

The base year of the NDC is 2006 which was the base year for the greenhouse gases (GHGs) inventory in the Third National Communication Report (TNC). The TNC was submitted in 2014, so the national anthropogenic emissions by sources and removals by sinks of GHGs was the latest available inventory estimated based on IPCC guidelines. Hence, the 2006 baseline scenarios which were based on the 2014 national circumstances and the projections of the emissions growth were the backbone of the proposed post-2020 NDC.

The contents of the Jordan's NDC stated the key national circumstances including the vulnerability and climate change impacts, the sustainable development challenges and the demographical, economic and political challenges.

The NDC's mitigation plans covered the national sectorial measures including primary energy, renewable energy, energy efficiency, transport, waste, industrial, water and agriculture. The estimated contribution encompassed the breakdown of the main six greenhouse gases emitted from the sectorial activities. The document stated that the contribution to be achieved by the end of 2030 while some of the mitigation actions are KPI-based target adopted by "2025- Jordan National Vision and Strategy" (2015).

The tracking of progress in NDC implementation in the short-term will be monitored by the competent institution/ministry in each sector on the basis of the specific monitoring framework adopted in the respective sector's policies and strategies. While the medium and long-term tracking progress will be monitored by the information of the GHGs inventory through the biennial update reports which Jordan as non-annex I country to the convention should submit every two years. And those mitigation actions that were adopted by Jordan's 2025-Vision and tied to KPI-based targets will be monitored by the "Performance Management Framework for Implementation" to assure that the policies, measures, and KPIs articulated in the Vision will be fulfilled.

The main highlights of Jordan's NDC include:

Jordan has committed to a 14% reduction in GHG emissions by 2030 compared to "business as usual" (BAU) projected emissions, 12.5% of which is conditional upon availability of finance and enhanced support. The two targets will be achieved based on implementing at least 70+ projects.

- 43 sectoral projects resulting from the mitigation scenario assessment articulated in the 2014 (NC3) report to UNFCCC, plus
- around 27+ sectoral priority projects proposed concurrently or newly planned and not listed in the TNC Report, i.e., proposed after the development of the NC3.

In addition:

- Gases covered: Carbon dioxide (CO₂); Methane (CH₄); Nitrous oxide (N₂O); Sulphur hexafluoride (SF₆); Perfluorocarbons (PFCs); and Hydrofluorocarbons (HFCs).
- Sectors covered: energy (including transport), waste, industrial processes, agriculture and land-use, land-use change and forestry (LULUCF) and solvents.
- The NDC has strong linkages to national development priorities, and sectoral strategies and targets are very strong.
- Integration of socioeconomic and gender dimensions is visible.
- Civil society and NGOs were mentioned.
- Adaptation measures are clearly detailed within the following sectors: water, biodiversity, health, agriculture and food security, as well as other economic and social development sectors.
- A large share of the measures will be implemented through sectoral strategies under the responsibility of the sector's ministries (energy, water, agriculture, health, and others).
- USD 5,700,000,000 is the total financing needs from which GoJ has already secured USD 542,750,000 to meet the unconditional target, which means the Country is in need of USD 5,157,250,000 to fulfill its conditional target.

Jordan like any developing country that need to enhance adaptation and resilience to address the impacts of climate change. So the adaptation measures are essential component of the NDC. The included adaptation measures covered the water, health, biodiversity and ecosystems, agriculture, food security sectors in addition to the sustainable development socioeconomic-oriented adaptation.

A3.2 National strategic climate priorities

The National Climate Change Policy (2013-2020)¹⁷⁷ states that the national priorities are **adaptation to climate change and mitigation of greenhouse emissions, with emphasis on adaptation as the imperative track.**

Specific strategic climate priorities for adaptation and mitigation are informed by Jordan's NDC¹⁷⁴ (from which a set of priority actions²³⁹ were decided) and by the Technology Needs Assessment²⁴⁰ by the Ministry of Environment. For adaptation, Jordan's National Adaptation Plan also provides strategic priorities. Priority areas/actions from Jordan's NDC, have formed the 'NDC Action Plan' or Partnership Plan, identified by NDC sector working groups (SWGs) established by line ministries and institutions, and using a prioritisation method and criteria, across key sectors (Transport, Energy, Agriculture, Health, Water). These were then finalised and validated by the Climate Change Committee.

In the following sections A3.2.1 and A3.2.2 the specific strategic climate priorities for both adaptation and mitigation (informed by the documents mentioned above) are detailed.

A3.2.1 Adaptation

Prioritised NDC Actions

An exercise lead by the Ministry of Environment and carried out by the NDC Partnership identified priority areas/actions from Jordan's NDC, to form the 'NDC Action Plan' or Partnership Plan. The following adaptation areas were prioritised during this exercise:

Water

- Improve energy efficiency of pumping in various well fields
- Water harvesting at large and small scales
- Building new dams.

Health and Tourism

- Improve the health care system preparedness to deal with emerging health issues
- Ensure a quick healthy energy transition (reduced air pollution)
- Include eco-tourism promotion as main part into The Ministry's recovery plans

Agriculture

- Climate smart agriculture techniques
- Climate Risk insurance
- Urban Green Areas- Parks
- Large-scale landscape restoration and reforestation efforts
- Non- traditional agricultural methods

National Adaptation Plan (in draft)

Adaptation priorities could also be captured from the NAP, which details the need to address vulnerabilities within the following sectors/areas:

²³⁹ Ministry of Environment (2020), "NDC Prioritization List". Provided to the NDC Partnership

²⁴⁰ Ministry of Environment (2016), "Technology Needs Assessment": <https://tech-action.unepdtu.org/wp-content/uploads/sites/2/2017/06/jordan-tna-report-march-2016.pdf>

- Water Sector:
- Agriculture sector
- Urban sector
- Socioeconomic
- Ecosystems and biodiversity
- Health

Technology Needs Assessment²⁴⁰

A 'Technology Needs Assessment' by the Ministry of Environment details priority areas in regard to technological needs, identifying **agriculture and water as the priority areas for adaptation**.

The final results for the water sector's top three priority adaptation technologies were:

1. Roof-top rainwater harvesting
2. Augmenting and expansion of Water Users Association (WUAs)
3. Desalination and brackish water treatment and re-use

The results for the agricultural sector's top three priority adaptation technologies were:

1. Water saving technologies, such as drip or subsurface irrigation
2. Farm-level water harvesting
3. Plant varieties resistant to climate change

The report has also provided a combined technology action plan (TAP) for the three priority technologies for each sector and key projects have been suggested to turn ideas into action (see Box 10 and Box 11).

Box 10: Technology Action Plan (TAP) for the three priority adaptation technologies for the water sector, as identified in the Technology Needs Assessment.

WATER SECTOR TECHNOLOGY ACTION PLAN (TAP)

1. Roof-top rainwater harvesting (RWH) technology:

Among the actions proposed for this technology are:

- Conducting a technical assessment and screening study to identify the most appropriate modality of RWH technology for different types of building settings in Jordan;
- Revising or developing a new water efficiency code/by-law for buildings to regulate water efficiency measures including RWH. The proposed code would address regulatory incentives such as tax cuts and fees deduction to encourage compliance by housing construction companies with RWH directives (building codes) and enhance feasibility and payback period;
- Developing awareness and information dissemination programs targeting relevant bodies (Ministry of Water and Irrigation, Jordan Engineers Association, Contractors Association).

Some actions inspired new project ideas. For example, the TAP for RWH inspired a proposal to establish a Regional Green Building Engineering Training Center in Jordan, which will be a fully-fledged demonstration green building with installed RWH technology among other sustainable building-oriented technologies (such as greywater, insulation, RE & EE technologies).

2. Empowerment and Expansion of WUAs Technology

Among the actions proposed for this technology are:

- Having a suitable law governing WUAs to empower its operations in Jordan;
- Strengthening WUAs to enable them to perform the mandated tasks (irrigation management transfer);
- Attaining effective means of financial sustainability for WUAs and building their capacity to develop income-generating activities and projects;
- Establishing a program for continuous training and capacity building and developing effective coordination and communication platforms for WUAs in the Jordan Valley;
- Developing capacity building programs to empower WUAs in marketing the concept of WUA as an innovation in participatory irrigation management, and improving the skills of WUAs in marketing their products;

It is expected that the above actions will become components of one mega program seeking to accelerate full irrigation management transfer to the WUAs throughout the Jordan Valley. This will contribute to removing the barriers for WUAs and facilitate its expansion in other parts of the country, such as southern Jordan.

3. Desalination and Brackish Water Treatment and Re-use

Because investment in these technologies requires a high capital cost, the scale for potential diffusion of this technology will be confined to a pilot site of promising readiness and preference for the authorities in charge (Water Authority of Jordan).

Among the actions proposed for this technology are:

- Promoting reasonable system prices for capital and operating costs through cost-effective desalination units integrated with energy solutions (such as solar energy);
- Promoting and providing incentives to locally-produced and assembled desalination units; and
- Promoting technologies of less environmental impact.

A well identified project idea for this technology is the installation of a PV-powered desalination plant with a capacity 3-3.5 MCM/year to be utilized for drinking water supply to Amman and the local area. A suggested site is the Al Husban Well Field (a set of 4 groundwater wells on the Dead Sea Groundwater Basin).

Box 11: Technology Action Plan (TAP) for the three priority adaptation technologies for the water sector, as identified in the Technology Needs Assessment.

AGRICULTURE SECTOR TECHNOLOGY ACTION PLAN (TAP)

1. Application of Water Saving Technologies, such as Drip or Subsurface Irrigation Technology

The ambition for said technologies was set as a target: “Increase the irrigated areas in the Jordan Valley and Highlands using water saving technologies to 60,000 hectares by 2030”. The ambition also extends to expanding water harvesting activities to the catchments of dry areas and the Badia region to deliver socio-economic and environmental benefits in the arable areas. To that end, the following actions are proposed for this technology:

- Improving agricultural extension services significantly to provide necessary advisory services and capacity building activities on the advantages of the technology;
- Developing capacity building campaigns targeting farmers;
- Providing economic incentives and subsidized tariffs for water saving irrigation practices in order to increase efficient use by land-owners and farmers;

2. Farm-level Water Harvesting

The scale and ambition for this technology is centered in local catchments in dry areas and the Badia region. Thus, among the actions proposed for this technology are:

- Implementation of pilot projects to demonstrate the advantages of the technology;
- Enabling provision of long-term and low-interest loans or grants through state funds, private sources (different banks), and international funds (WB, IFAD, GEF, GCF, Adaptation Fund); and
- Supporting the creation of a stakeholder network for the development and transfer of the technology through a network of technical experts.

3. Introduction (or Promotion) of Plant Varieties Resistant (Adaptive) to Climate Change

The scale of application for this technology will be restricted to rain-fed agricultural areas, where cereal-legume cropping systems are predominant. Therefore, the following actions are proposed for this technology:

- Establishing modern breeding programs to produce climate change resilient varieties in collaboration with multinational and international organizations;
- Developing specific subsidy mechanisms and incentives to the farmers to promote the utilization and dissemination of the climate change resilient crop varieties;
- Strengthening institutional capacity; and
- Promoting knowledge transfer and increasing public awareness regarding the benefits of improved varieties.

NOTE: The three technologies prioritized in the water and agricultural sectors have distinctive characteristics and independent applied aspects in terms of resources, management modalities, beneficiary groups, and stakeholders involved, as well as unique technical and governance barriers. Thus, the three technologies were addressed and assessed separately (this is not the case for priority mitigation (energy and transport) technologies; see section A3.2.2)

A3.2.2 Mitigation

Prioritised NDC Actions

An exercise lead by the Ministry of Environment and carried out by the NDC Partnership identified priority areas/actions from Jordan's NDC, to form the 'NDC Action Plan' or Partnership Plan. The following mitigation areas were prioritised during this exercise:

Energy

- Installed capacity of RE targets
- RE as share of Energy mix targets
- Energy access targets
- Solar rooftop target
- Commitments to address existing fossil fuel targets e.g. coal phase out targets, no new coal beyond project pipeline commitments, air quality targets
- Energy storage targets
- Targets for smart meter deployment

Transport

- Amman BRT and Amman-Zarqa BRT
- Improve and promote public transportation system (using Intelligent transport systems)

Industry

- Low-carbon technology R&D
- Incentives for Low-carbon industries
- Promote EE and RE

Waste

- Improve Solid Waste management in landfills and promote for waste to energy projects
- Improve the operations and the energy efficiency of wastewater treatment plants and networks

Technology Needs Assessment²⁴⁰

A 'Technology Needs Assessment' by the Ministry of Environment details priority areas in regard to technological needs, identifying energy and transport as the priority areas for mitigation.

The final results for the energy sector's top three priority mitigation technologies were:

1. Solar thermal
2. PV for electrification
3. PV for water pumping

The three top-ranked priority mitigation technologies for the transportation sector were:

1. Bus Rapid Transit
2. Improving pedestrian infrastructure
3. Ticketing systems to improve the quality and the attractiveness of public transport services

The report has also provided a combined technology action plan (TAP) for the three priority technologies for each sector and key projects have been suggested to turn ideas into action (see Box 13 and Box 12).

Box 12: Technology Action Plan (TAP) for the three priority mitigation technologies for the energy sector, as identified in the Technology Needs Assessment.

ENERGY SECTOR TECHNOLOGY ACTION PLAN (TAP)

The main actions proposed are:

- Removal of financial and economic barriers;
- Enforcement of standards;
- Focused training programs; and
- Effective awareness programs.

The following three main project ideas have been suggested:

- Designing financial support mechanisms and subsidizes for solar powered systems;
- Developing a complete PV process industry; from silicon to module;
- Developing a high-tech comprehensive solar thermal industry; flat, evacuated tube, and parabolic trough technologies.

Box 13: Technology Action Plan (TAP) for the three priority mitigation technologies for the transport sector, as identified in the Technology Needs Assessment.

TRANSPORT SECTOR TECHNOLOGY ACTION PLAN (TAP)

The main actions proposed are:

- Introducing regulations that incentivize users and potential users of public transportation;
- Planning strategic rehabilitation of the main streets that will contain BRT lanes;
- Institutionalizing the roles of stakeholders;
- Organizing capacity building programs for drivers and operators; and
- Organizing a broad awareness campaign to incentivize users and the potential users of public transportation.

The following three main project ideas have been suggested:

- Establishing a new sustainable transportation graduate course of study (Master degree program) at Jordanian universities to train practitioners in this understaffed field;
- Planning a public transportation project between Amman and Irbid;
- Modernizing public transportation vehicles.”

A3.3 NDC update 2020-2021

Jordan's NDC is currently being updated and was not available for inclusion in this review. However, to date the country has prioritised 35 actions from a long-list of c.200 (included in an Appendix) which will be further prioritised.

It is recommended that before commencing the LTS development, the final prioritised actions – both shortlisted and long-listed – are reviewed for inclusion in the LTS.

At present, the table below identifies the shortlisted 35 actions and their status and benefits. Note that 4 actions have been removed due to cancellation / funding already received.

Table 18: Prioritised NDC actions

Action ID	Action name	Stakeholder	Status	Potential Mitigation Benefit asmt. ²⁴¹	Potential Adaptation Benefit asmt. ²⁴²
1	Wastewater networking (al-Koura district), in addition to lifting stations implementation & wastewater treatment plant for (beit edees, kafr, abeel, kafr ewan, kafr rakeb...)	MWI- JVA	Requires funding	-1	2
2	Feasibility study to reduce water losses and increase water savings in the northern part of King Abdullah Canal	MWI-WAJ	No further action – already funded		
3	Investment Water Project to improve Water Supply at Balqaa Governorate - Increased capacity in Balqa'a Governorate to collect and treat wastewater in a region that is not serviced with water sanitation services	MWI- JVA	Requires funding	1	2
4	Expansion of Madaba Wastewater Treatment Plant	MWI- JVA	Requires funding	1	2
5	Enhance the Energy Efficiency in the well fields and Pumping Stations	MWI-WAJ/ Ministry of Energy	Requires funding	2	0
6	Establish a rainwater harvesting from household roofs project financing facility to support projects that augment rural and urban water supply	MWI- JVA	Requires funding	1	1
7	Blue Economy Principles for Improved Touristic Competitiveness, Livelihoods of the Fisherman Community, Industrial Development and Monitoring Indicators of Pollution Control and Climate Change in the Jordanian Sector of the Gulf of Aqaba, Red Sea	ASEZA	Requires funding	0	1
8	Green Works in Agriculture and Forestry - the protection and sustainability of forest wealth	MOA- Ministry of Labour- MOPIC- CBOs	Requires funding	1	2
9	Reduce soil erosion through the management and harvesting of rainwater amongst small farmers in rural areas in Jordan	MOA, Small Farmers	Requires funding	1	1
10	Exploitation of treated water in increasing vegetation area - Land reclamation, agricultural development and water harvesting in Irbid Governorate	MOA	Requires funding	0	1
11	Help small farmers and rural families adapt to climate change - Supporting poor families in Ma'an Governorate, improving the income of poor families in the northern Jordan Valley, Irbid	MOA/ Small farmers cooperative societies	Requires funding	0	2

²⁴¹ Conditional on the implementation of certain steps, stakeholder have to confirm whether this will be undertaken.

²⁴² Conditional on the implementation of certain steps, stakeholder have to confirm whether this will be undertaken.

Action ID	Action name	Stakeholder	Status	Potential Mitigation Benefit asmt. ²⁴¹	Potential Adaptation Benefit asmt. ²⁴²
	Governorate - investment in small ruminants to support poor rural families				
12	Develop of range lands for climate change mitigation through social cooperation and water harvesting techniques - water harvesting and improving the income of poor families in Balqa and Amman	MOA	Requires funding	2	2
13	Disseminate climate change adaptation techniques through smart agriculture production	MOA/NARS	Requires funding	1	2
14	Assist the irrigated farms to face the climate change impact through implement adaptation techniques such as use water irrigation efficiency - Assist the impact of climate change on crop production and crop water requirements in different bioclimatological regions of Jordan	MOA - Land and Irrigation dept.	Requires funding	0	2
15	Develop and technical support the Climate related Agricultural Risk management programs/systems - Agricultural Risk management Fund - Frost Project	MOA	Requires funding	-1	1
16	Implement climate change proofing for agricultural crops including set up an integrated Pest management (IPM) System	MOA/Plant Protection Directorate/Pest Control Department	Requires funding	0	2
17	Establishment surveillance system for climate sensitive diseases to develop health forecast system as an early warning alert system through 15 sentinel hospitals and 20 health centres	Ministry of Health	Requires funding	0	2
18	Establishment of Leishmania Unit in the Division of Parasitic and Zoonotic Diseases	Ministry of Health	Requires funding	0	1
19	Fostering mobility in Amman through a Bus rapid transit (BRT) network	Greater Amman Municipality / MOT	Requires funding	2	1
20	Access to public transport services increased in Irbid and Zarqa cities	MOT- Municipalities of the Irbid and Zarqa urban centres- LTRC	No further action – already funded		
21	Access to public transport services increased in Jarash	MOT, Jarash Municipality, LTRC	No further action - Covered in action 24		
22	Battery-electric buses deployed for use in public transportation	MOT-LTRC-GAM-MEMR-	Requires funding	2	0

Action ID	Action name	Stakeholder	Status	Potential Mitigation Benefit assmt. ²⁴¹	Potential Adaptation Benefit assmt. ²⁴²
		NEPCO-MoEnv-JEF			
23	Battery-electric vehicles deployed for use in public/government fleets	MOT- MOF - GDF - PM-Jordan custom - JPD - Audit Bureau	Requires funding	1	0
24	Untitled (United national electronic payment project)	GAM-MOT-LTRC	Requires funding	0	0
25	Phase 1: Solar Powered Electric Bus Fleet Pilot in Karak, Ma'an and Tafailah Governorates	GAM-MOT-LTRC	Requires funding	2	0
26	Encouraging and supporting local industries to manufacture renewable energy components	JCI	Requires funding	0	1
27	Activating the recently established Renewable Energy and Energy Efficiency Fund (JREEEF)	MEMR/JREEEF	Requires funding	2	1
28	Encouraging the use of solar energy for water heating	MEMR/JREEEF , local banks, chambers of commerce and industry, local CBOs	Requires funding	2	1
29	Requiring the implementation of green building codes	MEMR/JREEEF , local banks, chambers of commerce and industry, local CBOs	Requires funding	1	2
30	Requiring all new buildings in the public sector to comply with Leadership in Energy & Environmental Design (LEED)	Jordan GBC	Requires funding	1	1
31	Rationalising energy consumption in all sectors and improving their efficiency and raising awareness about the long-term financial benefits of energy efficiency	MEMR, MEMR/JREEEF , local banks, chambers of commerce and industry, local CBOs, EDCOs, local banks	Requires funding	1	0
32	Providing appropriate financial incentives for energy efficiency projects and raising awareness about the incentives provided by the renewable energy and energy conservation law; and providing funding to allow assessing the potential of saving energy, for schools, hospitals and other facilities (hotels, commercial buildings)	MEMR/JREEEF , local banks, chambers of commerce and industry, local CBOs, local ministries, Agriculture	Requires funding	1	1

Action ID	Action name	Stakeholder	Status	Potential Mitigation Benefit assmt. ²⁴¹	Potential Adaptation Benefit assmt. ²⁴²
		Credit Corporation			
33	Attracting private sector investment to the energy sector	Energy and Minerals Regulatory Commission (EMRC)	No further action - cancelled		
34	Expanding the use of solar cooling in commercial and industrial facilities	JCI	Requires funding	1	1
35	Hydro pumped storage	JCI	Requires funding	1	-1

A3.4 Sub-national climate planning and actions

The following sub-national climate action plans have been developed and reviewed – details are recorded in the table in section 10.1. Plans include:

- Municipality of Greater Irbid Sustainable Energy & Climate Action Plan (SECAP).
- Municipality of Greater Karak Sustainable Energy & Climate Action Plan (SECAP).
- Municipality of Greater Aqaba Special Economic Zone Authority Sustainable Energy & Climate Action Plan (SECAP).
- Local Climate Action Plan Ayoun Municipality- draft
- Local Climate Action Plan Busaira Municipality- draft
- Local Climate Action Plan Deir Alla Municipality- draft
- Amman Climate Plan, a Vision for 2050 - published in 2018
- Amman Resilience Strategy- published in 2017
- Green City Action Plan²⁴³ (still a draft to be published this year – this plan will contain all actions from the Resilience Plan, Amman Climate Action Plan besides new identified actions and it will focus on implementation).

There are several key observations from the review of these action plans and feedback from stakeholders consulted. These are:

- GAM is represented in the NCCC but was not consulted or considered during the development of the EDP nor the NGGP that was issued in 2017. There is a considerable gap in communication between the government and GAM.

Amman 2050 and net zero

The Amman Climate Plan is the only plan in Jordan that covers the whole period to 2050, and the only one with a net zero goal. It is therefore very important for the LTS. The Plan was developed by World Bank consultants, and the role of GAM was specifically focused on providing activity data. The Plan utilised the CURB model – two GAM staff took training but did not carry out the analysis.

The net zero goal was chosen to align with the target that C40 member cities committed to. GAM reported that they will need support in planning how to achieve the actions set out in the plan as at present, they do not know how they will be achieved. GAM is being urged to start using the MRV system and they are considering it seriously.

The key lessons from the Amman plan are the importance of local development; the need for a clear implementation plan that identifies *how* the target will be achieved, and consultation with all involved parties. Furthermore, capacity building process for the local staff should be planned for from the outset – staff working on the plans should be retained and should have clear succession plans.

Nesreen Dawoud (Acting Chief Resilience Officer of Amman C40 focal point, Green climate action plan focal point)

²⁴³ <https://ebrdgreencities.com/news-events-and-publications/amman-gcap-launch/>

- All municipalities confirmed that they don't communicate their plans to the MoEnv. GAM communicated that they are considering starting to use the MRV system but this is not yet operational.
- All the plans are well written and presented, but unfortunately there are major weakness in implementation, reporting and verification. As such, it is difficult to ascertain what, if anything, is being delivered as a result of these plans.
- Many actions related to, for example, energy saving and water conservation, are implemented under other programs and not reported in the plans. They are therefore often not complete.

There is clearly opportunity to better align with sub-national activities and plans, however, not least because mitigation commitments and ambitions are greater at the level of local government. Improved communication and governance structures that better incorporate local governments within national activities and tracking processes would also help support better integration of activities and implementation of actions.

Annex 3 – Vulnerability and Risk Assessment

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1 Introduction

This document describes the elements underlying the identification of long-term actions and objectives of the adaptation component of Jordan Long-Term Strategy (LTS). The aim of the LTS is to “ensure climate-resilient future” in the following ways:

- The LTS is intended to detail the long-term vision and goals for 2050 (e.g., related to sustainable development, mitigation, and adaptation) and sectoral pathways for achieving the strategy’s objectives, including ensuring a just transition.
- The LTS also intends to provide a framework to explore the cross-sectoral interactions in the light of the multiple policy objectives of mitigation, socio-economic development, adaptation and environmental sustainability specific to national context.
- In addition, the LTS serves as an overarching guiding document to “ensure policies and investment are not locked in carbon-intensive technology/infrastructure/behaviour”. Typically, LTS may offer sectoral plans and strategies for NDCs to translate into detailed implementation plans.

Ensuring that adaptation is inherent to an LTS is key to ensure that efforts are undertaken to reduce a country’s vulnerability to climate change reduced, as integration in long-term planning will incentivise consideration in short- and medium-term strategies. This is particularly relevant to focus on in vulnerable countries contributing less than 1% of total GHG emissions. Adaptation also ensures that (i) mitigation efforts will not increase vulnerability in other sectors and lead to maladaptation, as may be the case with some key mitigation actions if considered in isolation (such as through the use of hydraulic energy), and that (ii) mitigation efforts will not be vain, as impacts from climate change may damage energy infrastructure or bring the country’s economic and social foundations to a standstill. Moreover, an LTS also has an objective to sustainable socio-economic development, which cannot occur without adapting to climate change as the impacts on vulnerable sectors and groups exacerbate poverty, and vice versa.

1.1 Methodology

1.1.1 Vulnerability and risk assessment

As a basis for recommending adaptation priorities and actions in the LTS, we conducted a sectoral vulnerability and risk assessments. The vulnerability and risk assessment and subsequent deliverables make systematic use of the definitions of terms from the Intergovernmental Panel’ Fifth Assessment Report (AR5) (IPCC, 2014) to assess climate vulnerabilities and potential impacts. As such, it defines:

- Climate vulnerability as a function of climate sensitivities and adaptive capacities
- Climate impact as a function of climate vulnerability and exposure to hazards
- Climate risks potential as a function of climate impacts and the likelihood of hazardous events,
- Adaptation as the process of reducing climate sensitivities, and/or increasing adaptive capacities, and/or reducing exposure to hazards.

These key terms are defined in [Table 1-1](#) below.

[Table 1-1: IPCC AR5 definitions of key terms](#)

Term	Definitions	
Vulnerability	“Propensity or predisposition to be adversely affected. Vulnerability encompasses... sensitivity or susceptibility to harm and lack of capacity to cope and adapt.”	
	<table border="1"> <tr> <td>Climate sensitivity</td> <td>“Degree to which a system or species is affected, adversely or beneficially, directly or indirectly, by climate variability or change.”</td> </tr> </table>	Climate sensitivity
Climate sensitivity	“Degree to which a system or species is affected, adversely or beneficially, directly or indirectly, by climate variability or change.”	

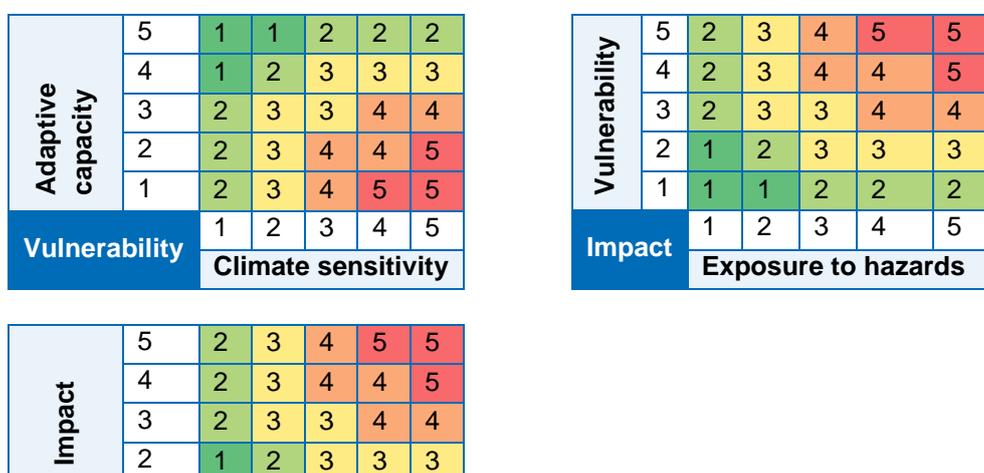
	Adaptive capacity	“Ability of systems, institutions, humans, and other organisms to adjust to potential damage, take advantage of opportunities, or respond to consequences”
Impact		“Effect on a natural or human system... the interaction of climate changes or hazardous climate events occurring within a specific time period and the vulnerability of an exposed society or system.”
	Hazard	“Potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources.”
	Exposure to hazards	“The presence of people; livelihoods; species or ecosystems; environmental functions, services, and resources; infrastructure; or economic, social, or cultural assets in places and settings that could be adversely affected.”
Risk		“The potential, when the outcome is uncertain, for adverse consequences on lives, livelihoods, health, ecosystems and species, economic, social and cultural assets, services (including environmental services) and infra-structure.”
	Likelihood	“The chance of a specific outcome occurring, where this might be estimated probabilistically “
Adaptation		“The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities.”

The assessment was provided at national and sectoral level for the following sectors: Agriculture; Built infrastructure; Business; Energy; Fisheries; Forestry; Health; Manufacturing; Mining and Quarrying; Transport; Water; Ecosystems. Where relevant, the assessment was further detailed into sub-sector, and at regional levels.

Each sector was provided a vulnerability and impact rating identified based on extensive desk research and expert judgement from national and international adaptation experts. Ratings and their interactions are described in [Figure 19](#) below.

To assess risks, “likelihood” was estimated based on a synthesis of climate scenarios, which is further detailed in Sections 1.1.2 and 2.2. Information from across the various studies is synthesised where projections are the same or very similar but where there are differences these are noted. This is intended to enable consideration of all likely futures.

Figure 19: Rating of vulnerability and impact in relation to climate variability and change



	1	1	1	2	2	2
Risk		1	2	3	4	5
		Likelihood				

Ratings were attributed to each sector, sub-sector and region based on the definitions described in Table 1-2.

Table 1-2: Ratings of climate sensitivities and adaptive capacities

Climate sensitivity rating	
1	Insensitive to climate
2	May be sensitive to climate
3	Climate sensitive
4	Very climate sensitive
5	Extremely climate sensitive
Adaptive capacity rating	
1	Major challenges to adjust or respond within existing climate limits
2	Minor challenges to adjust or respond within existing climate limits
3	Able to adjust or respond within existing climate limits but major challenges beyond them
4	Able to adjust or respond within existing climate limits but minor challenges beyond them
5	Able to adjust or respond regardless of climate
Exposure to hazard	
1	Asset with few or no unit with little to no value is not exposed to the hazards.
2	Asset with some or few units of moderate value has some exposure to the hazards.
3	Asset with many units of moderate value has some exposure to the hazards.
4	Asset with some or few units of important value is highly exposed to the hazards.
5	Asset with many units of important value is highly exposed to the hazards.
Likelihood	
1	Very low likelihood
2	Low likelihood
3	Medium likelihood
4	High likelihood
5	Very high likelihood

The resulting assessment and sources of information are recorded in a summary matrix provided in Module 1 of the workbook provided with this report. Final ratings may be interpreted as described in Table 1-3.

Table 1-3: Interpretation of the vulnerability and impact ratings

Vulnerability rating	Impact rating
----------------------	---------------

1	Highly resilient	1	Very low impact
2	Resilient	2	Low impact
3	Potentially vulnerable	3	Medium impact
4	Vulnerable	4	High impact
5	Highly vulnerable	5	Very high impact
Risk rating			
1	Very low impact, very low likelihood		
1	Very low impact, low likelihood		
1	Low impact, very low likelihood		
2	Medium impact, very low likelihood		
2	Low impact, low likelihood		
2	Medium likelihood, very low impact		
3	Medium impact, high likelihood		
3	High impact, medium likelihood		
4	Medium impact, high likelihood		
4	High impact, medium likelihood		
5	Very high impact, high likelihood		

1.1.2 Synthesis of climate scenarios

The synthesis of climate scenarios reviews and synthesises long-term climate projections for Jordan (up to 2100), in order to inform the assessment of future climate hazards and risks. This allows to evaluate the probability of climate hazards and infer the risk that those hazards lead to negative impacts in the specific sector and regions.

1.1.2.1 Climate modelling

Future climate change is predicted using Earth System Models (ESMs) which vary complexity, with General Circulation Models (GCMs) amongst the most complex. However, the complex process representation and large spatial coverage of GCMs (generally used for global-scale projections) means that a low spatial resolution is necessary to permit computational efficiency. As a result, GCMs are often downscaled to form Regional Circulation Models (RCMs) with higher spatial resolution and thus a greater ability to capture national-scale climate change in greater detail. It is important to note that no two models produce identical outputs, as they vary in mathematical formulation and process representation – as a result, a range of models (or a model ensemble) are usually used to allow a range of predictions to be considered, and often a multi-model mean taken.

Climate models require information on future atmospheric greenhouse gas (GHG) concentrations as a key input, which are usually derived emissions scenarios such as the Relative Concentration Pathways (RCPs). The four main RCPs used by the IPCC are RCP2.6, RCP4.5, RCP6.0 and RCP8.5 (with the number representing the radiative forcing expected in 2100 under each scenario). RCP2.6 corresponds to a stringent mitigation scenario where warming is *likely* to be kept below 2°C above pre-industrial temperatures; RCP4.5 and RCP6.0 are considered two “intermediate” scenarios; pathways between RCP6.0 and RCP8.5 represent scenarios with no additional mitigation efforts, with RCP8.5 often considered a worst-case scenario (IPCC, 2014) which is in line with current emissions trajectories (Sherwood *et al.*, 2020).

1.1.2.2 Methods for synthesising scenarios

Adaptation requires assessment of all likely futures rather than focusing on one preferred future in the hope that it comes true (Smithers *et al.*, 2008). Therefore, this report summarises all information from the reports of studies described above, i.e. in relation to all RCPs, timescales and spatial scales.

Where possible, two timescales are considered: mid-term changes (~2050), as this is the time horizon addressed by Jordan's LTS, and long-term changes (~2100), in order to enable consideration of longer-term risks. Most of the scenario summaries (section 2) rely on information from only one or two studies, with only RCP8.5 being explored by all three of the studies in [Table 1-4](#). Where there are significant differences between the projections of different studies these are noted and, if possible, explained.

Since publication of the IPCC Fifth Assessment Report (IPCC, 2014), future climate projections for Jordan have been produced by a number of studies. [Table 1-4](#) details the studies considered here and identifies the RCPs modelled in each study, the climate models used, and the spatial and temporal coverage of the outputs.

Table 1-4 – A summary of the climate modelling studies considered in this document.

Reference	RCM	Resolution (km)	GCM	RCPs modelled				Variables	Spatial scale	Temporal scale
				2.6	4.5	6.0	8.5			
Ministry of Environment (2014)	DMI	50	EC-EARTH (coupled to RCM)		✓		✓	Temperature (mean, min, max) Precipitation Consecutive dry days (i.e., drought) Heavy precipitation days (i.e., flood risk)	Jordan (national with regional variation noted)	1980-2100
		50	CanEMS2 (coupled to RCM)		✓		✓			
	SMHI	50	CNRM-CM5 (coupled to RCM)		✓		✓			
		50	EC-EARTH (coupled to RCM)		✓		✓			
		50	MIROC5 (coupled to RCM)		✓		✓			
		50	HadGEM2-ES (coupled to RCM)		✓		✓			
		50	MPI-ESM-LR (coupled to RCM)		✓		✓			
		50	NorESM-LR (coupled to RCM)		✓		✓			
		50	GFDL-ESM2 (coupled to RCM)		✓		✓			
RICCAR (2017)	RCA4 ensemble	50	EC-EARTH (drives RCM)		✓		✓	Temperature Precipitation Extreme events	Jordan river basin (broadly national)	1950-2100
		50	CMRM-CM5 (drives RCM)		✓		✓			
		50	GFDL-ESM22M (drives RCM)		✓		✓			
WHO (2015)	N/A	~200	CMIP5 ensemble	✓				Temperature Consecutive dry days (i.e., drought) High precipitation days (i.e., flood risk) Heat waves	Jordan (national)	1900-2100

1.1.2.3 Limitations

It is important to note that the models and methodologies used by the studies summarised in [Table 1-4](#) vary. The RICCAR Arab Climate Change Assessment Report of 2017 uses the RCA4 model ensemble, consisting of three RCMs that are downscaled from GCMs (EC-EARTH, CMRM-CM5 and GFDL-ESM22M) of the CMIP5 model ensemble (used by the IPCC Fifth Assessment Report; IPCC, 2014). The Ministry of Environment (2014) study ([Table 1-4](#)) also uses an ensemble of models, but with RCMs couple to the 9 GCMs of the Africa CORDEX ensemble. The only study explored here that uses GCMs, rather than downscaled RCMs, is the WHO (2015) study. However, this study does use still an ensemble of GCMs (the CMIP5 ensemble), which improves the reliability of their results (compared to the use of a singular model) despite the use of low spatial resolution GCMs.

It is also important to note that climate models themselves often incur significant uncertainty. This uncertainty arises from numerous factors including the range of potential future emissions scenarios, the spatial resolution of the model, and the complexity of process representation within the model at which climate is depicted in the model. For instance, the limited or simplified representation of physical processes occurring at smaller scales than the model resolution (sub-grid scale processes) must be compensated for, often via model calibration. Other sources of uncertainty arise from the various feedback mechanisms included in the models, such as ocean circulation, albedo, or clouds and radiation (IPCC, 2014).

Finally, the studies summarised in [Table 1-4](#) do not provide climate projections for the full range of RCPs. In particular, RCP6.0 is not examined by any study. However, the studies in [Table 1-4](#) do cover RCP2.6 (a best-case scenario), RCP8.5 (a worst-case scenario) and RCP4.5 (an intermediate scenario). Therefore, a lack of projections for RCP6.0 (another intermediate scenario) is not considered a limitation for this exercise.

2 Results

2.1 Vulnerability assessment

As a result of the vulnerability assessment, sectors were provided a vulnerability score from 1 to 5 (least to most vulnerable, and least to most at risk). The sectoral and sub-sectoral analysis and their results are presented in details in sections Water sector vulnerability 2.1.1 to 2.1.12 below.

2.1.1 Water sector vulnerability

Jordan is considered one of the ten poorest countries in water worldwide. The main surface and groundwater water resources of fresh water in Jordan are shared with neighbouring countries. This situation has resulted inadequate fresh water available for Jordan. Furthermore, the pressure on water resources has been increasing due to the fast population growth rate, massive influxes of refugees from neighbouring countries and rapid economic development. Currently, the country's renewable water supply only meets about half of the population's water demands. Given Jordan's limited water resources and the doubling of its population over the last two decades, the gap between water demand and supply has been constantly increasing.

Jordan's water resources are located far away from its population centres, in particular the Greater Amman area where about half the country's population lives and which lies at about 1,000 meter above sea level. To address this challenge, Jordan has developed an extensive water supply infrastructure to provide water for both irrigation and municipal uses.

Table 2-1 Results from the water sector vulnerability assessment, by subsector and regions

Sector	Overall vulnerability	Sub-sectors (regions)	Vulnerability
Water	4.9	Water supply (S)	5
		Water supply (N)	5
		Surface water management (S)	5
		Surface water management (N)	5

		Groundwater management (S)	5
		Groundwater management (N)	5
		Water collection (S)	5
		Water collection (N)	5
		Wastewater treatment	4

Sensitivity

Surface water levels depend on rainfall level and temperatures, which affect water evaporation rates. As a dry country **subject to the subtropical** aridity of the Arabian desert, surface water is highly sensitive to a worsening in temperature and precipitation levels. In turn, **groundwater** recharge is sensitive to precipitation changes, which affect the rate of recharge. As a baseline, Jordan is already also one of the most water-scarce countries in the world. In addition, groundwater are currently being used twice as quickly as it can be recharged. So far, water deficit has been handled through the unsustainable practice of overdrawing highland aquifers, resulting in lowered water tables and declining water quality.

Population growth increasing demand on water resources and the transboundary nature of many of Jordan's main water sources further compounds these sensitivities.

Water collection has been noted in national strategies as a key measure to address Jordan's water security issues. For example, rainwater harvesting on rooftops in urban areas is suggested as an adaptation measure for the water sector in Jordan's National Adaptation Plan (NAP). However, water collection efforts in Jordan are sensitive to future changes in precipitation. As precipitation conditions vary across Jordan, so does climate sensitivity. A particularly sensitive area is the Yarmouk River basin which is located in a semi-arid region between Jordan and Syria. As the basin's water content depends on evaporation rates and rainfall level, this location makes it particularly sensitive to climate change. Studies show that the YRB surface water is very vulnerable to climate change as a result of temperature changes and precipitation changes.

Water treatment is noted as a key water-sector adaptation measure in Jordan's National Adaptation Plan and water-sector strategies (e.g. Water for Life). Treated municipal wastewater is a source of stable and good quality water supply. Wastewater treatment in Greater Irbid has been found to be sensitive to climate change, with the removal of BOD, COD and TSS in wastewater treatment plants often negatively affected by increasing temperatures (Abdulla and Farahat, 2020). Floods, cold or hot weather might impair the efficiency of the treatment process, making it much more expensive and less effective.

Adaptive capacity

Sustainable management of water resources has become of high importance in Jordan. The water for life national strategy (2016-2025) has indicated measures such as rainwater harvesting, wastewater treatment, grey water reuse as actions to be implemented to adapt to water scarcity. However, the gap between water supply and demand (i.e. water deficit) is still increasing.

Jordan's adaptation plan states the following prioritised adaptation options for the water sector (1) Enhance surface water storage, using all options, e.g. dams & reservoirs, ponds, and cisterns (water harvesting), (2) Improved climate, surface water and groundwater monitoring systems and, data collection, and data quality, (3) Promote Rainwater Harvesting in urban areas from rooftops (4) Establishing drought early warning system in cooperation with other partner institutions (5) Promote the use of irrigation technologies in saving water and energy.

One the other hand, other sectors' prioritised actions in the NDC (such as hydro pumped energy storage or increases in pumps' number and efficiency) may exacerbate the pressure on water resources. These priorities illustrate a lack of knowledge and capacity on sustainable water management across sectoral stakeholders. The assessment also highlighted that the human,

technical and administrative capacities of the Climate Change Directorate at Ministry of Water and Irrigation and related Authorities could be improved, and that there remains a severe funding gap between Jordan's climate objectives and public finances, which is preventing timely implementation of climate action.

Water treatment has been noted in national strategies (e.g. NAP) as a key measure to address Jordan's water security issues. In general, wastewater-related activities are managed centrally, making them more susceptible to policy interventions. However, to manage water treatment sustainably, it is key that policy interventions account for climate projections, including quantifying uncertainty and measuring the magnitude of its impact, which is not yet the case.

2.1.2 Agriculture sector vulnerability

Jordanian agriculture is established in the highlands and marginal steppes where most of the rain-fed farming is practiced, the Badia (mostly livestock systems and some cultivation in watersheds and from deep bore irrigation), and the lowlands (Jordan Valley) that thinly stretches from the North West to the South West.

The main crops are wheat and barley. In 2016 the total cultivated area in Jordan reached 273 thousand hectares, of which 39.1% is being irrigated while the rest is rainfed. The distribution of the cultivated crops is between 31.8% fruit trees, 18.5% vegetables and 49.7% field crops. In turn, livestock is largely raised in Badia region, which covers most (80%) of country. In this area, the fragile commons of land suffer from overgrazing of seasonal browse and over-pumping of groundwater to irrigate vegetables and fruit trees.

Table 2-2 Results from the agriculture sector vulnerability assessment, by subsector and regions

Sector	Overall vulnerability	Sub-sectors (regions)	Vulnerability
Agriculture	4.0	Crops (N)	5
		Crops (S)	5
		Livestock (N)	3
		Livestock (S)	3

Sensitivity

Due to urban expansion in the high rainfall zones, rainfed agriculture had expanded towards the marginal lands of arid and semiarid areas that receive less than 200 mm of annual rainfall. For many years, rainfed agriculture in these areas suffered from droughts and accelerated soil degradation and overgrazing of natural vegetation. The available water and land resources are limited as most of the country's land is arid and is used as open range. As a result, this sector is highly sensitive to future climate change. Land fertility and the productivity of both rainfed and irrigated crops are sensitive to changes in temperature and precipitation.

Regarding **crops**, future increases in precipitation would not compensate for the adverse impacts of the temperature increase on barley. The trend for wheat is slightly different from barley, as the increase of temperature was more advantageous for yield if rainfall would increase. Potato yields are particularly sensitive to high-temperature stress because tuber induction and development can be directly inhibited by even moderately high temperature.

Livestock is typically sensitive to changes diseases and parasitic infestation, decreasing trend of feed and fodder resources. Changes in these factors in turn impact productive and reproductive performance of livestock. Feed is not mainly imported in Jordan due to high cost. Hence, livestock relies on local crop production and the sector is thus subject to the same climate sensitive as crops. The amount of suitable land for livestock and the productivity of livestock is sensitive to changes in temperature and precipitation (NAP).

Population growth in Jordan (causing increased demand for agricultural products) further compounds these sensitivities.

Adaptive capacity

So far, the main adaptation measures at farm level included conservation agriculture, improvement of water use efficiency, implementation of water harvesting techniques, supplemental irrigation with treated wastewater and community-based management of rangeland resources. However, because arable, rain-fed land was exploited extensively, future growth of agricultural production depended on increased irrigation.

Currently, irrigated agriculture consumes less than 64 percent of the country's water resources. However, this share is expected to decrease as water will be prioritized for domestic and industrial uses. Areas under marginal rainfed production will have less adaptive capacity than areas that are more productive and irrigated agricultural land. This is because a shift towards irrigated agriculture to meet the country's need of food is not possible as the country's water resources are scarce.

The policy of the government is concerned with increasing production of food commodities, improving the efficiency of resources allocation, adopting new technologies to increase productivity of plant and animals, improving the quality of products, improving the standard of living, producing competitive agriculture products and encouraging the rural food industry. To achieve food security through policy the government took several measures for improving agricultural sector.

However, a severe funding gap still persists between Jordan's climate objectives and public finances, which is preventing timely implementation of climate action in agriculture.

Jordan's poor, rural communities (who have a greater dependence on agriculture and hence, higher sensitivity) are noted in the NAP to have a lower adaptive capacity. This is caused by insufficient financial resources as well as poor knowledge of the impacts of climate change on crops, livestock and land.

2.1.3 Fisheries sector vulnerability

Jordan is almost entirely land-locked and only has a small (27 km) marine coast to the Red Sea, centred on the port of Aqaba. All marine landings in Jordan are made into this port. With a very small marine fishing industry, Jordan is almost totally dependent on imports to meet its fish requirements, although aquaculture production has been increasing in recent years and now accounts for around 50 percent of national fish production, delivered by a relatively small working community. The marine fishing industry in Jordan is small and the fishery is entirely artisanal in nature, consisting of approximately 85 fishermen and 40 boats.

In Jordan, the aquaculture sector contributes with less than 0.01% of Gross Domestic Product (GDP) (MoA, 2014). There are more than 1,000 small-scale farmers recorded (producing 64.0% of the annual local fish production), who use their irrigation ponds for fish rearing, as most of them raise fish for home consumption and in order to clean their ponds from algae. However, few of them raise fish as additional income, since fish farming is considered to be the second source of income. There are only 21 commercial fish farms that raise fish for maximizing profit and consider fish farming to be their main source of income (MoA, Annual Report, 2015).

Table 2-3 Results from the fisheries sector vulnerability assessment, by subsector and regions

Sector	Overall vulnerability	Sub-sectors (regions)	Vulnerability
Fisheries	3.5	Marine fishing	4
		Aquaculture	3

Sensitivity

Marine fishing relies on healthy marine ecosystems. The biggest problem affecting the marine environment is pollution from human activities such as industry, transport and tourism.

Marine ecosystems are also sensitive to sea surface temperatures, water pH (sensitive to atmospheric CO₂ levels) and the oxygen content of water (sensitive to water temperatures and

human activities that cause nutrients to flow from land to sea). In addition to significant coral reefs, extensive seagrass beds occur along the Jordanian coast, particularly in the north and at Big Bay in the south. These areas appear to be important nursery areas for commercial fish species such as rabbitfishes, goatfishes, and parrotfish and may have regional, as well as local, significance in this regard.

Beyond marine fishes, **aquaculture** production and infrastructure are also sensitive to extreme events such as floods and droughts, diseases, parasites and harmful algal blooms. The incidence of diseases, parasites and algal blooms are themselves a function of temperature changes, as well as polluting activities.

Adaptive capacity

Jordan's prime concern for its marine areas is one of overall marine environmental protection (particularly of the coral reef areas in the Gulf of Aqaba) and the small marine fisheries and fisheries resources are generally administered within this broader context only, which may dilute priorities for reducing vulnerabilities of non-marine fisheries.

Although fisheries legislation has been in place (and essentially unchanged) since 1943, there is no designated authority in Jordan responsible for fisheries management. The Ministry of Agriculture, however, has broad regulatory powers in the field of commercial fishing in the Territorial Waters of Jordan and, through the Agricultural Code of 1973 (Part IV, Articles 180-186, on Aquatic Resources) administers the licensing of fishermen and vessels, the prohibition on the use of explosives or other harmful fishing methods and the damaging or taking of coral. In addition, the Aqaba Regional Authority (ARA) has broad powers to control activities within Aqaba, including the inshore territorial waters in the Gulf of Aqaba. These powers encompass marine environmental protection and dispute resolution between fishing and other interests.

The lack of awareness regarding climate change and climate change impact, leads to a weak consideration while planning a long-term management plan for coastal areas. As a result, proposed adaptation measures for coastal areas (detailed in Jordan's TNC and NAP) focus on raising awareness of climate change impacts, improving understanding of the impacts on fisheries in particular, enhancing monitoring of ecosystems and species in the Gulf of Aqaba, and strengthening coastal conservation and management at Aqaba.

However, Jordan's existing adaptation strategies do not currently include measures for the aquaculture sub-sector (likely due to the low economic importance of this sector). While the fisheries sector accounts for a very low proportion of GDP (potentially restricting financial capacity to adapt), there are 21 commercial fish farms in the country (with the remaining aquaculture in Jordan for home consumption). The low prevalence of aquaculture in Jordan means the total costs of adaptation in this sub-sector are likely to be relatively low.

2.1.4 Forestry sector vulnerability

The forest vegetation in Jordan can be divided into natural forests that are composed of evergreen shrubs, pine and juniper forests as well as broadleaf forests. Private forests are registered in the name of their private owners and are found mostly in the northern part of Jordan where higher rainfall is prevailing. They include natural forest vegetation and tree plantations on farms, in the form of windbreaks and shelter-belts. Private forests account for less than 4 % of the total declared forestland.

Table 2-4 Results from the forestry sector vulnerability assessment, by subsector and regions

Sector	Overall vulnerability	Sub-sectors (regions)	Vulnerability
Forestry	4.5	Public forest management (NW)	5
		Private forest management (N-highlands)	4

Sensitivity

Climate change effects is expected to impose significant stress on ecological and socioeconomic systems. Forests are threatened by predicted drought cycles (i.e. sensitivity to temperature and precipitation), the occurrence of fires or icing conditions (i.e. sensitivity to extreme weathers/events), urban and rural expansion, and illegal deforestation.

Forests in Ajloun and Jarash are noted in the TNC to be amongst the most climate sensitive ecosystems in Jordan, based on analysis of four sensitivity indicators (moisture dependence, temperature tolerance, geographic range/fragmentation and, and other stressors pressure level).

Adaptive capacity

The management of forest areas are the responsibility of the government and it lacks proper enforcement of laws and regulations mechanism as well as weak involvement of local community that may damage or over exploit the forests to satisfy their needs (food and wood burning for energy). The insufficient budget allocation in general and to extension departments in particular results in a lack of awareness

There remains a severe funding gap between Jordan's climate objectives and public finances, which is preventing timely implementation of climate action.

2.1.5 Ecosystem vulnerability

Jordan embraces four bio-geographic regions. These regions are Mediterranean, Irano-turanian, Saharo-Arabian (Badia) and Sudanian (Tropical penetration). The presence of four bio geographically regions in a small country is very unusual whereas, ecologically and genetically adapted species to local Jordan conditions is a great heritage for national and international mankind. The four regions comprise 14 vegetation types which provide the natural habitats for over 4,000 species of fauna and flora, from the terrestrial, marine and freshwater environments in addition to exotic genetic resources. Jordan is currently home to about 2543 species of vascular plants represent 1% of the world flora. Further, Jordan hosts 644 animal species of which, 83 are mammal species, 436 species of birds, 348 species of fish and many more others (MOE, 2014 and Al-Eisawi, 1985, 1994, and 2013).

Jordan is almost entirely land-locked and only has a small (27 km) marine coast to the Red Sea, centred on the port of Aqaba.

Table 2-5 Results from the ecosystem sector vulnerability assessment, by subsector and regions

Sector	Overall vulnerability	Sub-sectors (regions)	Vulnerability
Ecosystems	4.8	Terrestrial ecosystems (S)	5
		Terrestrial ecosystems (N)	5
		Freshwater ecosystems	5
		Coastal ecosystems	4

Sensitivity

On the **terrestrial ecosystems**, biodiversity in Jordan is facing challenges. Desertification is progressing and the population of a considerable number of species of flora and fauna has decreased including some birds and Oak trees (which were considered an essential component of the forest ecosystem).

Jordan's TNC notes that the forests vegetation in Ajloun and Jarash are among the most climate-sensitive ecosystems, based on analysis of four sensitivity indicators (moisture dependence, temperature tolerance, geographic range/fragmentation, and other stressors pressure level). Freshwater ecosystems in valleys have also been considered among the most climate-sensitive ecosystems according to the same indicators

Marine ecosystems are also sensitive to sea surface temperatures, water pH (sensitive to atmospheric CO₂ levels) and the oxygen content of water (sensitive to water temperatures and human activities that cause nutrients to flow from land to sea).

The rate of endemism is considered high among the Red Sea fishes and represents 13.7% of the total fish species recorded with seven species of fishes recognized as endemic to the Gulf of Aqaba (Goren and Dor 1994). More than 20% of mollusks and echinodermata as well as several species of algae occurring in the Gulf may be endemic. These species are considered unique, rare to the area and they are sensitive to climate change since they need specific conditions and cannot tolerate environmental changes or the introduction of invasive species.

Adaptive capacity

Detailed national studies regarding fauna for food and agriculture are limited and lack proper documentation. Jordan's water strategies have proposed building dams at main wadis to enhance water storage, which would help maintain suitable water levels for the water vegetation. However, dams could also act to impede natural migration routes of any fauna in this ecosystem.

Overall marine environmental protection is of prime concern in Jordan's marine areas (particularly of the coral reef areas in the Gulf of Aqaba). However, there remains a lack of awareness regarding climate change and climate change impact, which leads to a weak consideration while planning a long-term management plan for coastal areas. As a result, proposed adaptation measures for coastal areas (detailed in Jordan's TNC and NAP) focus on raising awareness of climate change impacts, improving understanding of the impacts on fisheries in particular, enhancing monitoring of ecosystems and species in the Gulf of Aqaba, and strengthening coastal conservation and management at Aqaba.

2.1.6 Health sector vulnerability

The healthcare system in Jordan includes public and private sectors. The public sector provides a majority of Jordan's 12,081 hospital beds. The private sector contributes to the country primarily through the provision of home healthcare. There is a total of 106 hospitals, public and private, in Jordan.

Table 2-6 Results from the health sector vulnerability assessment, by subsector and regions

Sector	Overall vulnerability	Sub-sectors (regions)	Vulnerability
Health	4.0	Physical health (S)	4
		Physical health (N)	4

Sensitivity

Temperature rises and changes in precipitation patterns could increase water scarcity and subsequent incidence of water-borne diseases [WHO/UNEP, 2005]. Further impacts of climate change in the region include health and occupational risks associated with increased temperatures, increased frequency of vector-borne, air-borne and respiratory diseases, and nutrition and food insecurity (INDC, NAP)

The incidence of vector borne diseases, water-borne diseases and food-borne diseases are sensitive to temperature changes, and precipitation changes (in particular, extreme precipitation events which can affect water treatment systems). Seasonal patterns of respiratory diseases are also sensitive to changes in temperatures and seasonal shifts.

One of the adaptation measures to cope with water shortage includes reuse of grey or treated wastewater in irrigation of trees or vegetables; this could increase the opportunity for transmission risk of several pathogens through crop contamination with pathogens that could cause outbreaks like Typhoid fever or Hepatitis A if the water is not well treated.

The increasing refugee population of Jordan is placing significant pressure on healthcare services, in particular hospitals.

Adaptive capacity

Despite recent reforms in education and health, Jordan faces ongoing challenges due to regional instability, high unemployment and pressure on natural resources and would need further capacity strengthening. Jordan has an approved national health adaptation strategy and has conducted a national assessment of climate change impacts, vulnerability and adaptation for health.

The NAP proposes the following adaptation measures:

- Building awareness of the health risks of climate change and the
- Building the capacity of public health and health care professionals to monitor, diagnose, and treat cases of climate-sensitive health outcomes, even when they change their incidence, seasonality, and geographic range.
- Developing new methods and tools for preparing for, coping with, and recovering from outbreaks of climate-sensitive diseases, such as early warning systems based on environmental information.
- Strengthening monitoring and surveillance programs to track climate-sensitive health outcomes and improving health services delivery to ensure prompt and effective treatment.
- Strengthening evaluation (and learning) programs designed to identify lessons learned and best practices in health adaptation and how these can be scaled up and out within and across countries.
- Improving governance and policies for managing the health risks of climate variability and change.
- Conducting research to develop new insights and innovative solutions to, for example, emerging and re-emerging infectious diseases.
- Raising the necessary human and financial resources to undertake these actions.
- Reduce Chronic malnutrition
- Reduce nutritional inadequacies

While public funding for climate action is limited, Jordan has still seen recent success in implementing improvements to its healthcare system. Since the implementation of Jordan's home healthcare initiative in 2017, the industry has trained 300 health professionals and gained the participation of 28 healthcare facilities, both public and private. The country is currently expanding home healthcare policy while other countries in the Middle East lack a structured home healthcare system, putting Jordan at one of the most modern healthcare systems in the region.

Yet, health infrastructures in Jordan are already stretched beyond their capacity to supply even basic health protection. While there is an increasing awareness that climate change poses significant health threats, health practitioners have historically concentrated on responses that deal reactively with climate-sensitive diseases, for example through curative treatment. Consequently, little attention has been paid to defining exactly what vulnerable and resource-poor developing countries can do differently, to implement a preventive strategy that minimizes adverse health impacts of climate change in a cost-effective manner, while at the same time helping to address current health problems.

2.1.7 Built infrastructure vulnerability

Jordan's cities have grown at a rate parallel with other cities in the MENA region - doubling, or depending on regional conflict, tripling every 25-30 years has been the latest trend. This has resulted in continued urban sprawl, which has been combined with a lack of urban planning for a number of decades. The Syrian refugee crisis has also created a problem of informal settlements.

Aqaba is Jordan's only coastal region and is characterised by a desert climate with a warm winter and a hot dry summer. There is currently very low rainfall, with June to be the driest month with 0mm of precipitation. The rainfall here averages 32 mm.

Amman has a varied topography and diverse climate. Extreme micro-climates mean that snow is not uncommon in the western and northern parts of the city, whilst at the same time rain is frequent in the centre and east, and high temperatures are a challenge in the south-eastern parts of the city. Amman is home to around 4 million residents, more than 42% of Jordan's total population

Table 2-7 Results from the built infrastructure sector vulnerability assessment, by subsector and regions

Sector	Overall vulnerability	Sub-sectors (regions)	Vulnerability
Built Infrastructure	4.0	Other (Aqaba)	4
		Other (Amman/Salt)	4
		Buildings (N)	4
		Buildings (S)	4

Sensitivity

In **all cities**, flooding and landslides can occur under high rainfall. The material used for the built infrastructure is not specifically made to withstand such events, so buildings are highly sensitive to precipitation conditions. Furthermore, it is mostly the poorer communities that live near Wadis and downstream, in so-called “random houses” unable to shield inhabitants from such events, compounding existing sensitivity.

In **coastal region**, infrastructure (incl. wastewater treatment plants, airport and roads) is sensitive to precipitation conditions and sea level rise. Electricity consumption is also sensitive to the occurrence of extreme events, in particular extreme heat.

Finally, **Amman** hosts a large proportion of Jordan's population the largest density of poor population in Jordan (30.6%), with political unrest in surrounding countries continuing to increase the population of refugees in the city. This is placing significant strain on the city's infrastructure and compounds existing sensitivities. Electricity consumption is sensitive to temperature, with extended heat and cold waves in the region resulting in the increased use of space heating and/or cooling. Infrastructure (wastewater treatment plants, Amman Airport and roads) are sensitive to precipitation (extreme precipitation can overwhelm sewage systems and transport infrastructure, with the occurrence of snowfall often bringing the city to a standstill), temperature (which can impact wastewater treatment), and extreme weather events.

Adaptive capacity

Several extreme events in the past exposed the lack of planning and weak crisis management.

Salt city is a less developed city - during past extreme weather events, community-led responses have been required due to the slow reaction of the Government.

The 'Amman Resilience Strategy' notes that developing a storm water drainage masterplan is one of the main urgent issues that the city needs to address in order to adapt to the occurrence of flash floods.

Financing of this storm water drainage system has been confirmed - the European Bank for Reconstruction and Development providing a financing package consisting of a JOD 4.0 million loan and a US\$ 11.4 million grant to the Greater Amman Municipality for the construction of a new stormwater drainage system inside the polluted Russaifa lagoon, a new underground water conveyance system and ancillary infrastructure including a water reservoir and a pedestrian bridge.

Aqaba's 'Sustainable Energy and Climate Action Plan' (SE-CAP) notes the following adaptation measures for infrastructure: (i) development of a water management plan, (ii) modelling predicted supply changes in the electricity from the locally available renewable energy supply (iii) mapping of sites with landslides and flood risks (iv) developing guides and awareness raising campaigns for citizens on how to save water and energy, especially during crisis (v) integration of sustainable drainage systems.

Moreover, Aqaba has already implemented continuous monitoring and an early warning system for extreme weather/disasters.

2.1.8 Transport vulnerability

Land transport accounts for roughly 70% of the transport sector's GDP, with passenger and freight road transport constituting the backbone of the national transport system.

Table 2-8 Results from the transport sector vulnerability assessment, by subsector and regions

Sector	Overall vulnerability	Sub-sectors (regions)	Vulnerability
Transport	5.0	Roads (N)	5
		Roads (S)	5

Sensitivity

Transport infrastructure is sensitive to precipitation conditions, with high precipitation events and snow events often bringing affected areas to a standstill.

Much of the transport network is located at areas with high risk of flash floods and snowstorms, and existing sewer systems were planned to receive less rainfall. Mountainous and hilly terrains exacerbate this sensitivity.

Adaptive capacity

There is currently insufficient planning and preparedness to handle extreme events such as flash floods and snowstorms (e.g. no vehicles available for snow clearance, insufficient sewer system)

A key objective of the transport sector GG-NAP is to promote the use of climate-resilient infrastructure in transport sector investment planning. However, it is also noted that funding sources for the some of the actions related to this objective (e.g. TR05) have yet to be confirmed.

2.1.9 Energy sector vulnerability

The increase in energy consumption and energy bills in Jordan have been escalating rapidly, which requires a special concern as a large percent of the energy is imported. The need for the reducing peak demand of the distribution network is essential to decrease the overall electricity generation cost.

Electricity production is mostly powered by gas and oil and in total, 96% of the country's energy needs coming from imported oil and natural gas. Natural gas imports all arrive at a central terminal in Aqaba.

Table 2-9 Results from the energy sector vulnerability assessment, by subsector and regions

Sector	Overall vulnerability	Sub-sectors (regions)	Vulnerability
Energy	3.0	Electricity	3
		Gas (Aqaba)	3

Sensitivity

The **electricity** demand in Jordan observes seasonal trends in a consistent and predictable manner. Efficient production and reliable availability of electricity requires comprehensive understanding of load demand trends to plan and match production with consumption. Although electricity demand depends on a combination of cultural and economic conditions, weather conditions remain as the major driver. The electrical system in Jordan has been facing several challenges including the failure to respond to increased demands induced by extreme temperatures. The electrical system in Jordan has been facing several challenges including the failure to respond to increased demands induced by extreme temperatures. Nonetheless, unlike other countries within the region, the electricity network is generally highly stable during extreme events.

Moreover, electricity production is mostly powered by **gas and oil** and in total, 96% of the country's energy needs coming from imported oil and natural gas. The oil and gas supply chain can be

disrupted by extreme events, making this sub-sector sensitive to changes in temperature, precipitation, and the occurrence of extreme weather. This sensitivity is compounded by Jordan's extremely high reliance on such imports.

Adaptive capacity

Jordan has plans to decrease reliance on imported fossil fuels, in part via the uptake of renewables. Jordan's National Renewable Energy Action Plan (NREAP) for the period 2018-2023 states official target for renewable resources to reach more than 37.14% of the total installed electricity capacity by the year 2023.

Investments into Jordan's renewable energy sector have already exceeded \$5 billion. Jordan's NAP notes the following as a medium priority measure to adapt to increased demand on energy for cooling devices and resulting power cuts: "Amendments to sector policies and regulations, such as building codes, to reflect climate change risks and direct people towards insulating buildings to reduce energy demand."

2.1.10 Business sector vulnerability

The financial services sector is one of the most robust and mature in Jordan, remaining resilient in the face of significant external volatility and retaining its role as a driver of economic growth in 2015. The banking sector in particular has been a major source of strength, with the Central Bank of Jordan (CBJ) maintaining a pro-growth monetary stance, following on from growth in deposits and profits at commercial banks in 2015.

Jordan's banking sector is the strongest segment of its financial services industry, with a history of dating back to 1948, when Arab Bank moved its headquarters from Jerusalem to Amman. Banking accounted for 18.82% of GDP as of mid-2015, making it one of the largest economic sectors in the kingdom.

Jordan's sales and services sub-sector is largely concentrated in the capital of Amman, which hosts almost half of the country's population. The historical city of Petra, the Dead Sea, and the port of Aqaba (Jordan's only coastal region) are significant tourist hot-spots.

Table 2-10 Results from the business sector vulnerability assessment, by subsector and regions

Sector	Overall vulnerability	Sub-sectors (regions)	Vulnerability
Business	4.0	Sales and services (mainly Amman)	4
		Tourism (Petra, Dead Sea, Aqaba)	5
		Financial (mainly Amman)	3

Sensitivity

The topography of much of Jordan makes it highly sensitive to precipitation, with flash floods occurring numerous times in recent years. The large, dense population Amman (and high concentration of Syrian refugees) makes the city sensitive to the occurrence of epidemics and places significant pressure on infrastructure for water, sanitation and drainage.

The **financial** sub-sector (e.g. banks and insurance) is sensitive to extreme weather events because they often bear the brunt of economic losses resulting from damage

The topography of districts within Petra, Aqaba and the Dead Sea makes these regions highly sensitive to precipitation, with flash floods occurring numerous times in recent years. The large, dense population Amman (and high concentration of Syrian refugees) makes the city sensitive to the occurrence of epidemics and places significant pressure on infrastructure for water, sanitation and drainage. As a coastal region, Aqaba is also sensitive to sea level rise. These sensitivities are directly reflected in the **tourism** sector, which depends on the cities' stability and resources to thrive.

Adaptive capacity

Over the past decade, several initiatives for the protection of Petra against natural hazards have been jointly implemented by UNESCO, the Petra Development and Tourism Region Authority (PDTRA) and the Department of Antiquities (DoA).

Jordan's Green Growth National Action Plan (GG-NAP) for the tourism sector notes the following green growth objectives:

- Enhance the resilience of critical infrastructure in key tourism areas to natural hazards and climate-related risks;
- Improve the effectiveness of processes and systems to protect tourists from natural hazards and climate-related risks;
- Increase the resilience of the tourism sector to climate change by improving its ability to identify and manage climate-related risks.

However, it is also noted that the financing for many of the actions related to these objectives (e.g. TM04, TM05) has not yet been secured.

The financial services sector is one of the most robust and mature in Jordan, remaining resilient in the face of significant external volatility and retaining its role as a driver of economic growth in 2015. However, even within existing climate limits, banks/insurance companies are likely to continue paying out for climate/extreme weather-related losses.

2.1.11 Manufacturing sector vulnerability

The manufacturing sector includes pharmaceuticals, fertilizers, textiles, Food and Beverages, cement, Pulp and Paper and packaging materials etc and comprised 21.2% of the Kingdom's GDP in 2018.

Table 2-11 Results from the manufacturing sector vulnerability assessment, by subsector and regions

Sector	Overall vulnerability	Sub-sectors (regions)	Vulnerability
Manufacturing	3.0	Plastics and plastic products (N)	3
		Plastics and plastic products (S)	3
		Other (N)	3
		Other (S)	3

Sensitivity

Due to the wide geographic distribution of operations, temperature and precipitation shifts and more frequent and severe extreme weather events will have complex impacts on the sector. Climatic conditions will affect the stability and effectiveness of infrastructure and equipment, environmental protection and site closure practices, and the availability of transportation routes. Climate change may also impact the stability and cost of water and energy supplies.

Adaptive capacity

The turmoil in the Arab region and the so-called "Arab Spring" have overwhelmed many aspects in the region. The Jordanian economy has been affected mainly by the situation specifically in regard to the manufacturing sector. Several challenges have hindered the economic growth and the profitability of organizations within the sector. Such challenges include the massive immigration of refugees, the instability in import and export, the drop in demand, and the environmental uncertainty. Adaptive capacity in regard to financing may therefore be considered low.

Currently, Jordan's adaptation strategies (e.g. those in the NAP and TNC) do not cover the manufacturing industry.

2.1.12 Mining and quarrying sector vulnerability

The mining industry in Jordan is dominated by the production of phosphate, potash, building and decoration stones, glass sand and other non-metallic resources. Recently, Jordan has been ranked as the sixth largest producer and the second largest exporter of phosphate, the fourth largest

producer and the second largest exporter of potash and has the 5th largest oil-shale reserves in the world. Also, Jordan has an important amount of uranium (around 3% of the world resources).

Natural resources varies from one place to another, among these is natural stone (rock) used mainly in construction and buildings, it is noticed that a high percentage of these quarries are spreading randomly and in an unstructured or studied manner without taking into consideration the environment or the regulations of sustainable development, the quarries especially depleted ones have become an environmental threat to humans, animals and plants, they caused the natural shape of the earth to be distorted and deformed, which requires to find a solution to this issue really fast, conduct studies to exploit and invest these resources properly and sustainably within a well thought out plan, while conserving the environment and the social and the economic development, establish a plan that aim to rehabilitate the abandoned quarries and find a way to benefit from them and educate the local community about these quarries.

Table 2-12 Results from the mining and quarrying sector vulnerability assessment, by subsector and regions

Sector	Overall vulnerability	Sub-sectors (regions)	Vulnerability
Mining and Quarrying	3.0	Mining (N)	3
		Mining (SW)	3
		Quarrying (Jerash-Petra)	3

Sensitivity

Due to the wide geographic distribution of mining and quarrying operations, temperature and precipitation shifts, and more frequent and severe extreme weather events will have complex impacts on the sector. Climatic conditions will affect the stability and effectiveness of infrastructure and equipment, environmental protection and site closure practices, and the availability of transportation routes. Temperature and precipitation changes can also impact the stability and cost of water and energy supplies.

Adaptive capacity

Low adaptive capacity of the sector is due to (1) inadequate law and regulations in both the mining and the quarrying sector, (2) a lack of conservation strategies, (3) political instability in the region. These may lead to significant negative effect on the mining and quarrying sector in the region, preventing them from decreasing their vulnerability to the potential impacts of climate change

2.2 Synthesis of climate scenario

IPCC's Fifth Assessment Report notes that more frequent hot temperature extremes are “*virtually certain*” as global mean surface temperature increases, and that it is “*very likely*” that heatwaves will be more frequent and last longer. However, it is important to note that confidence in projections of extreme events is generally weaker than for projections of long-term averages due to the limited number of relevant detection and attribution studies (Seneviratne *et al.*, 2012).

Table 2-13 - Summary of mid-term (~2050) and long-term (~2100) climate projections for Jordan by climate scenario²⁴⁴

Parameters	RCP2.6		RCP4.5		RCP8.5	
	2050	2100	2050	2100	2050	2100
Temperature	+1.7°C	+1.7°C	+1.2 to 1.5°C	+1.5 to 2.1°C	+1.7 to 2.9°C	+3.2 to 5.9°C
Precipitation	NA	NA	-4 to -15%	- 7 to -25%	-7 to -15%	-13 to -22%
Drought	+ 5 days	+ 5 days	NA	+ 30 to 40 days	NA	+ >40 days
Floods	No significant change	No significant change	No significant change	No significant change	+ 4 days with precipitation >20mm	+ 8 days with precipitation >20mm
Heat Waves	45 days per year	45 days per year	NA	NA	75 days per year	200 days per year

More detailed summaries of each climate scenario are given below (Table 2-15, Table 2-16 and Table 2-17). These will be used to assess the risk of climate impacts in Jordan, in order to inform the development of Jordan's LTS. Only one study provides information on variation of potential climate impacts at a regional level, and it is important to note that this analysis is rather high-level (with regional variation largely reported qualitatively). As a result, quantitative regional detail in existing climate projections is somewhat lacking. However, supplementary maps are provided (2.2.4) that visualise the regional variability in climate model projections for Jordan. It is also important to note that the climate change variables explored by the different studies vary slightly.

Further information on the different baselines (or reference periods) used by each study is given in Table 2-14.

Table 2-14 - Baseline (or reference period) conditions for each study

Report	Mean annual temperature (°C)	Mean annual rainfall (mm)	Days of warm spell (Heatwave)	Days of extreme rainfall (>20 mm)	Consecutive dry days (drought)	Baseline/Reference Period
Ministry of Environment (2014)	Not specified	Not specified	NA	Not specified	Not specified	1980-2010 (centred around 1995)
RICCAR (2017)	Not specified	Not specified	NA	NA	NA	1986-2005
WHO (2015)	18.5	NA	10	8	190	1950-2000

²⁴⁴ Where possible, data from each study has been synthesised to produce a range (reference periods of each study are deemed similar enough to allow for this).

2.2.1 RCP2.6

Table 2-15 – Future climate projections for Jordan under RCP2.6 (a stringent mitigation scenario)

Parameters	Projected climate impacts on the parameters
Studies used	WHO (2015)
National	
Temperature	Temperature increase is limited to ~1.7°C above 1990 levels in 2100 (with temperature stabilised at this level by 2050)
Precipitation	NA – see ‘Flood Risk’
Drought	The longest dry spell (consecutive dry days) is predicted to increase by about 5 days on average by 2100 (stabilising at the level by 2050) , though large interannual variability persists.
Floods	The number of days with very high precipitation (>20 mm) sees minimal increase (an average of 0 days’ worth of change). One or two models in the ensemble predict much greater increases in extreme precipitation (upper bound of ~40 days) over the next century, though this may be considered unreliable as the vast majority of models predict very small changes in flood risk under this stringent mitigation scenario.
Heat Waves	Days of warm spell are limited to ~45 days (annually) on average by 2100 (stabilising at this level by 2050)
Regional	
Temperature	NA
Precipitation	NA
Drought	NA
Floods	NA
Heat Waves	NA

2.2.2 RCP4.5

Table 2-16 - Future climate projections for Jordan under RCP4.5 (an intermediate scenario)

Parameters	Projected climate impacts on the parameters
Studies used	MoE (2014); RICCAR (2017)
National	
Temperature	<u>MoE (2014)</u> : Mean temperature predicted to increase by ~1.5°C by 2050 (range: 1.3°C – 2.3°C) and ~2.1°C by 2100 (range: 1.7°C – 3.2°C). <u>RICCAR (2017)</u> : Mean temperature increases from reference period (1986-2005) of 1.2°C at mid-century and 1.5°C at end-century (multi-model average – all models agree on direction of trend and predict very similar magnitude of change).
Precipitation	<u>MoE (2014)</u> : Mean rainfall predicted to decrease by ~15% by 2100 (range: -2% to -25%). Precipitation decreases are fairly stable at this level from 2050 onwards. <u>RICCAR (2017)</u> : Mean precipitation change from reference period (1986-2005) of -4% at mid-century and -7% at end-century (multi-model average – models broadly agree on the direction and magnitude of the trend).
Drought	<u>MoE (2014)</u> : Consecutive dry days likely to increase up to mid-century, and could reach around 30-40 days (annually) by 2100 (especially likely in the South).

Parameters	Projected climate impacts on the parameters
Floods	MoE (2014): Heavy precipitation days (>10 mm) not predicted to change significantly.
Heat Waves	NA
Regional	
Temperature	MoE (2014): Largely homogeneous, but greater increases expected in West (Error! Reference source not found.).
Precipitation	MoE (2014): Increased precipitation is likely up to the year 2050 in the Eastern and Southern Badia regions and at the Northern and Southern Highlands. Decreased precipitation is likely for the rest of the country, and is most likely in the West and near Aqaba. By 2100, projected decreases in precipitation will cover the whole country, except the northeastern region (Error! Reference source not found.).
Drought	MoE (2014): Southern Highlands particularly at risk - consecutive dry days expected to reach 30-40 here by 2100.
Floods	MoE (2014): No significant changes predicted.
Heat Waves	NA

2.2.3 RCP8.5

Table 2-17 - Future climate projections for Jordan under RCP8.5 (a worst-case scenario)

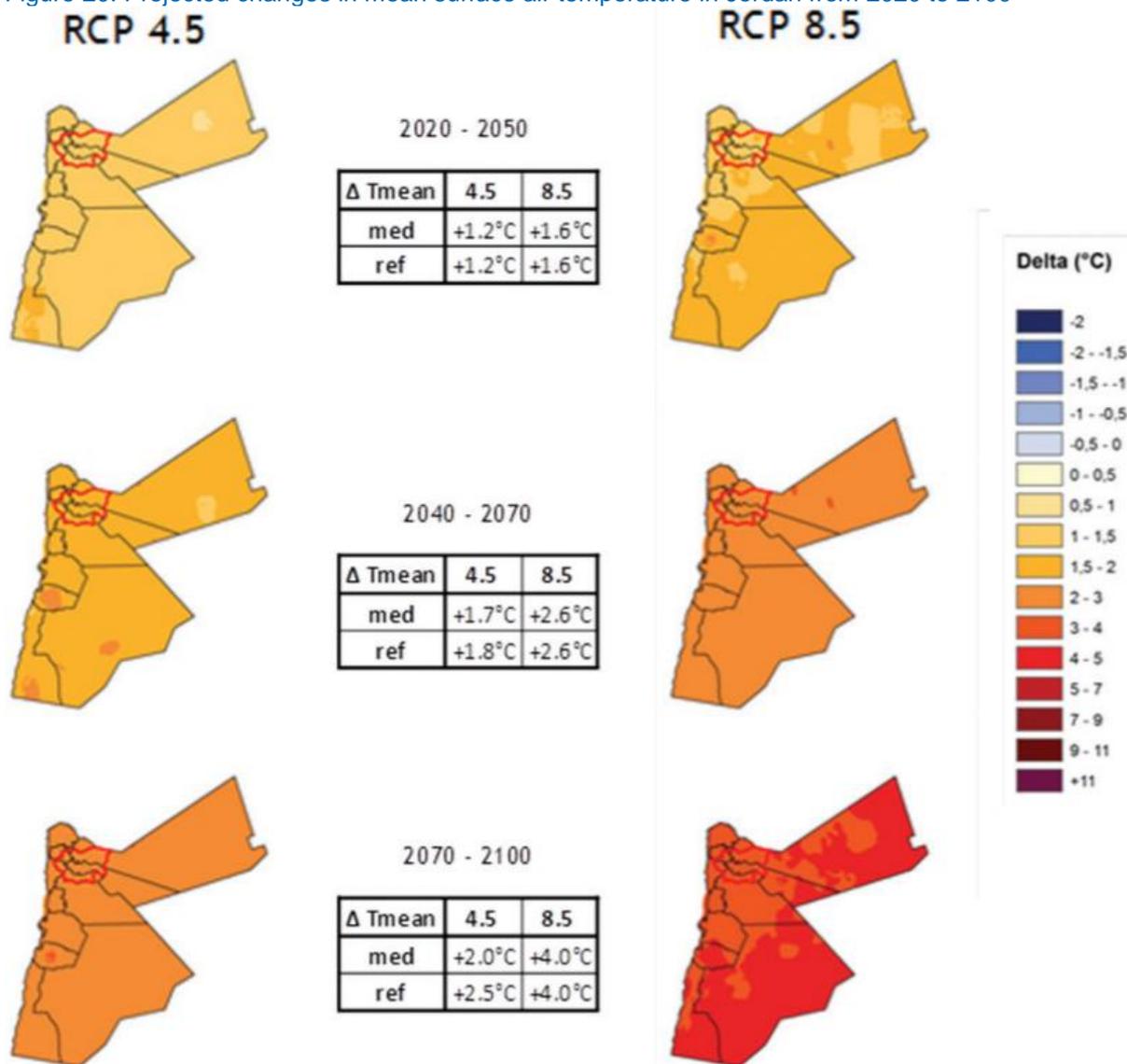
Parameters	Projected climate impacts on the parameters
Studies used	MoE (2014); RICCAR (2017); WHO (2015)
National	
Temperature	<p>MoE (2014): Mean temperature predicted to increase by ~2.4°C by 2050 (range: 1.9°C – 3.3°C) and ~4°C by 2100 (range: 3.8°C – 5.5°C).</p> <p>RICCAR (2017): Mean temperature increases from reference period (1986-2005) of 1.7°C at mid-century and 3.2°C by end-century (multi-model average – all models agree on direction of trend and predict very similar magnitude of change).</p> <p>WHO (2015): Mean annual temperature projected to rise by ~5.9°C from 1990 to 2100 (~2.9°C increase by 2050). Note that this study uses coarser resolution GCMs than the other studies, so these projections may be considered less reliable, but may still be considered as an upper bound of potential warming.</p>
Precipitation	<p>MoE (2014): Mean rainfall predicted to decrease by ~15% by mid-century (range: 2% to -25%) and decrease by ~22% by 2100 (range: -9% to -35%).</p> <p>RICCAR (2017): Mean precipitation change from reference period (1986-2005) of -7% at mid-century and -13% by the end of the century. A decrease in summer precipitation of 22% is also predicted for the end-century (multi-model average – models broadly agree on the direction and magnitude of the trend).</p>
Drought	<p>MoE (2014): Consecutive dry days likely to increase more than under RCP4.5 (i.e., >40 days by 2100), and is more likely to occur in the western and southern regions.</p> <p>WHO (2015): The longest dry spell (consecutive dry days) is indicated to increase from an average of about 190 days to about 210 days by 2100 (~200 days by 2050), with continuing large interannual variability.</p>
Floods	<p>MoE (2014): Heavy precipitation days (>10 mm) not predicted to change significantly.</p> <p>WHO (2015): The number of days with very high precipitation (>20 mm) could double (increase of ~8 days on average) from 1990 to 2100 (~ +4 days by 2050), increasing the risk of floods. However, results from different models of the ensemble vary significantly, and the use of GCMs with coarse spatial resolution makes these predictions less reliable than MoE (2014) predictions (which use higher resolution RCMs).</p>

Parameters	Projected climate impacts on the parameters
Heat Waves	<u>WHO (2015)</u> : The number of days of warm spell is projected to increase from about 10 days in 1990 to about 200 days on average in 2100 (~75 days by 2050).
Regional	
Temperature	<u>MoE (2014)</u> : Largely homogeneous, but greater increases expected in West (Error! Reference source not found.).
Precipitation	<u>MoE (2014)</u> : Decreased precipitation is most likely in West, but is likely for most of the country by 2050. However, increased precipitation is likely in northern highlands of Irbid and highlands of Tafeeleh and Karak up to 2050. After 2050, precipitation is projected to shift towards the Southern Badia, where increased precipitation is predicted to extend along the southeast frontier up to 2100 (Error! Reference source not found.)
Drought	<u>MoE (2014)</u> : Additional increases in consecutive dry days (beyond RCP4.5) most likely in Southern Highlands, West and Zarqa River Basin.
Floods	<u>MoE (2014)</u> : No significant changes predicted.
Heat Waves	NA

2.2.4 Supplementary maps

Maps of climate projections for RCP4.5 and RCP8.5 (from the Ministry of Environment (2014) study) are provided in [Figure 19](#)Figure 20 and Figure 21**Error! Reference source not found.**, to demonstrate regional variation in climate change in Jordan.

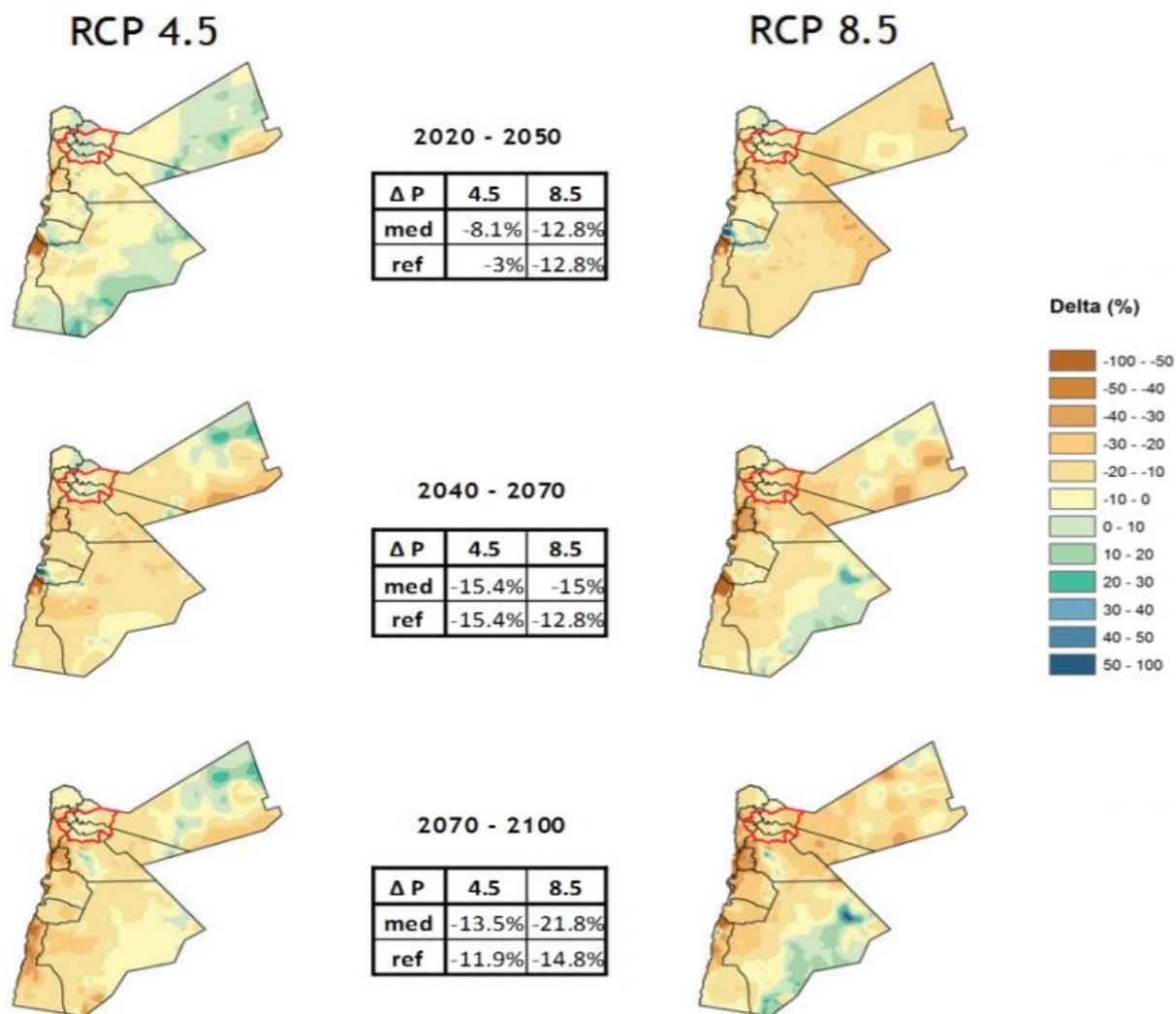
Figure 20: Projected changes in mean surface air temperature in Jordan from 2020 to 2100



Source: Third National Communication²⁴⁵

²⁴⁵ Ministry of Environment (2014) Third National Communication to the UNFCCC. <https://unfccc.int/resource/docs/natc/jornc3.pdf>

Figure 21: Projected changes in precipitation in Jordan from 2020 to 2100.



Source: Third National Communication²⁴⁶

²⁴⁶ Ministry of Environment (2014) Third National Communication to the UNFCCC. <https://unfccc.int/resource/docs/natc/jornc3.pdf>

2.3 Risk assessment

2.3.1 Water sector risks

Having identified potential hazards, their likelihood and magnitude, sectors were provided a risk score from 1 to 5 (least to most at risk). The risk score reflects the exposure of key vulnerable assets to hazards and the resulting potential impacts, and the likelihood of the hazards occurring.

Table 2-18 shows the outcome of this assessment for the water sector.

Table 2-18 Results from the water sector risk assessment, by subsector and regions

Sector	Overall Risk	Sub-sectors (regions)	Risk
Water	4.2	Water supply (S)	5
		Water supply (N)	4
		Surface water management (S)	5
		Surface water management (N)	4
		Groundwater management (S)	5
		Groundwater management (N)	4
		Water collection (S)	4
		Water collection (N)	3
		Wastewater treatment	4

Vulnerable assets exposed

In the water sectors, the following assets are directly exposed to climate hazards:

- Water sources (~892 million cubic metres of annual water availability)
- Surface water sources (supplying ~239 million cubic metres annually)
- Groundwater sources (supplying ~75 million cubic metres annually)
- Wastewater treatment (26 WWTPs)
- Infrastructure of water supply such as supply network and treatment plants and reservoirs²⁴⁷
- Household water supplies (~2 million households)
- Irrigated agriculture (~19.5 thousand ha)

Potential impacts of the hazards on the vulnerable assets

Increased temperatures (and heatwaves) are expected to increase evapotranspiration, which would reduce the amount of water stored and available for water supply. In turn, decreased precipitation (and droughts) are expected to reduce the natural replenishment of Jordan's water sources, reducing the amount available for water supply. However, a concurrent increase in the number of days with

²⁴⁷ The key elements of Jordan's overall water infrastructure are: (i) the Al-Wehda Dam on the Yarmouk River; (ii) the King Abdullah Canal (KAC) in the Jordan Valley which is fed primarily by the Yarmouk River, the Mukhaibah springs near the Yarmouk River and a number of wadis draining into the Jordan Valley; (iii) the As-Samra wastewater treatment plant that treats most of Greater Amman's wastewater and discharges it to the Zarqa River; and (iv) the King Talal Dam on the Zarqa River from where the water returns to the KAC downstream of Deir Alla for irrigation in the Lower Jordan Valley.

The following systems provide drinking water for the Amman-Zarqa metropolitan area: (i) The Disi Water Conveyance Project that extracts 100 million m³ (2.6×10¹⁰ US gal) of water a year from the fossil Disi aquifer 325 kilometres (202 mi) south of Amman; (ii) the Deir Alla-Amman system pumps up to 90 million m³ (2.4×10¹⁰ US gal) a year water from the KAC to Amman over a height of 1,200 metres (3,900 ft) and treats it in the Zai water treatment plant; (iii) the Ma'in-Mujib system desalinates up to 38 million m³ (1.0×10¹⁰ US gal) per year of brackish water from the northeastern shore of the Dead Sea, stores it in Mujib Reservoir and pumps it to Amman, also covering a difference in altitude of 1,200 metres (3,900 ft); (iv) a pipeline from a wellfield near the Azraq oasis to the East, local wells, and a small wellfield South of Amman.

extreme (>20mm) rainfall is expected to increase the occurrence of floods, which could overwhelm drainage/sewage systems and cause contamination of water supply.

Projected changes will affect water supply in the following ways:

- Decrease in water resources available for different uses (specially for domestic use and water for irrigation).
- Intermittent supply for domestic household use will affect people health (less drinking water and less hygiene).
- Fluctuating rainfall among regions will affect agriculture. The northern and west highlands are rainfed agriculture areas (wheat, vegetables and fruit trees), large numbers of farmers livelihoods will be affected.
- Prolonged periods of drought may cause migration or force farmers to seek other sources for their livelihoods.
- Water scarcity and food insecurity would be exacerbated by climate change and increased population growth;
- Climate change is expected to increase water demand for crops

Stream flow rates are expected to decrease by up to 22 % by the year 2080. This decrease will be particularly severe in the months of maximum peak flow (February and March), perhaps reaching as much as 35–40 %. A minor increase in stream flow rates is expected to occur in some months. Based on these results, impacts of climate change are projected to raise water deficits in Jordan.

Evaporation from dams as well as from the already deteriorated transboundary surface water of Yarmouk river and Jordan river will affect water quality and quantity used for agriculture and domestic uses. Moreover, decreasing precipitation will reduce the efficacy of rainwater harvesting schemes, which could in turn reduce water supply. The YRB surface water flow is predicted to be significantly decreased, affecting water harvesting plans.

Finally, wastewater treatment in Greater Irbid has been found to be sensitive to climate change, with the removal of BOD, COD and TSS in wastewater treatment plants often negatively affected by increasing temperatures. Floods, cold or hot weather might impair the efficiency of the treatment process, making it much more expensive and less effective.

Secondary impacts of this include:

- reduced agricultural output (impacting food security and income, and potentially forcing farmers to migrate)
- reduced human health (from decreased water and food security) and hygiene (from reduced water availability or ineffective water treatment or contamination).

2.3.2 Agriculture sector risks

Having identified potential hazards, their likelihood and magnitude, sectors were provided a risk score from 1 to 5 (least to most at risk). The risk score reflects the exposure of key vulnerable assets to hazards and the resulting potential impacts, and the likelihood of the hazards occurring.

Table 2-19 shows the outcome of this assessment for the agriculture sector.

Table 2-19 Results from the agriculture sector risk assessment, by subsector and regions

Sector	Overall risk	Sub-sectors (regions)	Risk
Agriculture	4.3	Crops (N)	5
		Crops (S)	4
		Livestock (N)	4
		Livestock (S)	4

Vulnerable assets exposed

In the agriculture sectors, the following assets are directly exposed to climate hazards:

- Water supply (~892 million cubic metres of annual water availability)
- Soils (total of ~11,000 sq km of agricultural land in Jordan)
- Crops (vegetables and citrus trees in Jordan Valley; olives and fruit trees in highlands, wheat and barley in Zarqa/Yarmouk basins)
- Livestock (~800,000 goats, ~3,000,000 sheep, ~77,000 cattle)
- Farmers / agricultural income (4.91% of GDP in 2019)
- Food security (population of ~10 million)

Potential impacts of the hazards on the vulnerable assets

Increases in temperature and heatwaves (causing evapotranspiration) and decreased mean precipitation and droughts (preventing replenishment of water sources) is likely to increase the gap between water supply and water demand. This could reduce the water supply available for irrigation. Decreasing rainfall may also increase the demand for water for irrigation (as rainfed agriculture becomes less viable).

Reduced water supply would have the following impacts:

- Fluctuating rainfall among regions will affect agriculture. The northern and west highlands are rainfed agriculture areas (wheat, vegetables and fruit trees), large numbers of farmers livelihoods will be affected.
- Prolonged periods of drought may cause migration or force farmers to seek other sources for their livelihoods.
- Water scarcity due to climate change is likely to be exacerbated by population growth

Droughts can also lead to desertification, which can significantly reduce soil fertility.

Reduced water supply, reduced soil fertility, as well as temperature changes (potentially taking temperatures outside of the optimum for specific crops) are likely to reduce agricultural crop output. This will have secondary impacts on the economy, farmer's livelihoods, and food security (and thus health).

In the specific case of wheat and barley in Zarqa/Yarmouk basins, future increases in precipitation would not compensate for the adverse impacts of the temperature increase on barley. The trend for wheat is slightly different from barley, as the increase of temperature was more advantageous for yield if rainfall would increase.

These impacts are likely to be more pronounced for agriculture in the Jordan Valley (irrigated) and the Zarqa/Yarmouk basins (likely to see prolonged dry spells) than for the rainfed agriculture in the highlands (where precipitation could actually increase up to 2050).

In the Badia (where most livestock agriculture is located), the fragile land already suffers from low rainfall (<200mm/year), overgrazing, and over-pumping of groundwater to irrigate vegetables and fruit trees. Further decreases in rainfall could force farmers to migrate or find other sources of income.

Extreme heat could also cause heat stress (and potentially death) of livestock.

These changes are likely to decrease agricultural output, which will reduce income generated from agriculture and negatively impact farmers livelihoods. Decreased agricultural output could also negatively impact food security in Jordan, which could have severe consequences on the health of its citizens (especially in poorer communities, and those reliant on subsistence agriculture). Rural and remote communities, often with a higher dependence on agriculture for income and food security, are likely to be impacted to a greater extent than urban communities.

2.3.3 Fisheries sector risks

Having identified potential hazards, their likelihood and magnitude, sectors were provided a risk score from 1 to 5 (least to most at risk). The risk score reflects the exposure of key vulnerable assets to hazards and the resulting potential impacts, and the likelihood of the hazards occurring.

Table 2-20 shows the outcome of this assessment for the fisheries sector.

Table 2-20 Results from the fisheries sector risk assessment, by subsector and regions

Sector	Overall risk	Sub-sectors (regions)	Risk
Fisheries	4.5	Marine fishing	5
		Aquaculture	4

Vulnerable assets exposed

In the fisheries sector, the following assets are directly exposed to climate hazards:

- Marine ecosystems (including fish species caught for consumption e.g. tuna)
- Fishermen (~85 fisherman)
- Income (0.01% of GDP)
- Food security (Jordan's population is ~10million). Fish consumption per capita in Jordan is medium compared to main peers as it reached 6.60 kg in 2013 (When compared to Jordan's main peers, fish consumption per capita in Iraq amounted to 2.90 kg and 8.20 kg in Saudi Arabia in 2013)
- Local marine fish production does not exceed more than 1 % of the total fishery consumption of Jordan.

Potential impacts of the hazards on the vulnerable assets

Increase in surface air temperature are likely to be accompanied by an increase in water temperature. When conditions such as the temperature change, corals expel the symbiotic algae living in their tissues. A spike of 1–2°C in ocean temperatures sustained over several weeks can lead to bleaching, turning corals white. If corals are bleached for prolonged periods, they eventually die.

These impacts are likely to cause further secondary impacts, such as a decrease in fish catches, which will cause negative impacts on income from marine fishing as well as food security. Decreased food security may also impact human health.

For aquaculture, temperature increases will also affect the temperature of waters for breeding, which could negatively impact fish productivity. This could impact the number of fish produced (impacting food security and thus human health) and the amount of income generated (affecting livelihoods of fish breeders, and the Jordanian economy).

2.3.4 Forestry sector risks

Having identified potential hazards, their likelihood and magnitude, sectors were provided a risk score from 1 to 5 (least to most at risk). The risk score reflects the exposure of key vulnerable assets to hazards and the resulting potential impacts, and the likelihood of the hazards occurring.

Table 2-21 shows the outcome of this assessment for the forestry sector.

Table 2-21 Results from the forestry sector risk assessment, by subsector and regions

Sector	Overall risk	Sub-sectors (regions)	Risk
Forestry	4.5	Public forest management (NW)	5
		Private forest management (N-highlands)	4

Vulnerable assets exposed

In the forestry sector, the following assets are directly exposed to climate hazards:

- Total forest area = ~975 km²
- Evergreen shrubs
- Pine trees
- Juniper trees

- Broadleaf forests
- Forest vegetation (52% of forest area)
- Tree plantations (48% of forest area)
- Private forests, accounting for around 4% of total forest area

In Jordan, as forests only represent around 1% of the total area, they are seen as important asset. At the national level and at the local level, forests provide communities with several services, such as social and recreational services and income generating marketed products such as medicinal and edible plants without and other provisioning services such as honey, wood, mushrooms, which contribute significantly to the Jordanian diet. Proper management of these services in Jordan is important for economic and noneconomic well-being of the community.

Potential impacts of the hazards on the vulnerable assets

Tree species each have distinct moisture dependence and temperature tolerance - increases in temperature and changes in precipitation patterns will therefore impact forest health and forest growth.

Impacts may manifest in one or more of the following way:

- Increasing temperatures and decreasing precipitation are likely to result in drought, which in turn can contribute to forest fires.
- Changing climatic conditions (in particular increasing temperatures) may impact the spread of forest disease.
- Extreme heat or heatwaves may cause forest fires.
- Loss of forests means loss of important forestry products, decreased ecosystem health and biodiversity, and reduced carbon sequestration.

2.3.5 Ecosystem risks

Having identified potential hazards, their likelihood and magnitude, sectors were provided a risk score from 1 to 5 (least to most at risk). The risk score reflects the exposure of key vulnerable assets to hazards and the resulting potential impacts, and the likelihood of the hazards occurring.

Table 2-22 shows the outcome of this assessment for the ecosystems.

Table 2-22 Results from the ecosystem risk assessment, by subsector and regions

Sector	Overall Risk	Sub-sectors (regions)	Risk
Ecosystems	4	Terrestrial ecosystems (S)	4
		Terrestrial ecosystems (N)	4
		Freshwater ecosystems	4
		Coastal ecosystems	4

Vulnerable assets exposed

In the ecosystem, the following assets are directly exposed to climate hazards:

- Vegetation/trees (14 vegetation types over four bio-geographic regions)
- Flora (>2500 plant species)
- Fauna (644 animal species of which, 83 are mammal species, 436 species of birds, 348 species of fish and many more others)
- Wadi flora (>200 species of flowers and wild grasses in Wadi Rum, including some medicinal plants)
- Wadi fauna (small mammals, birds, reptiles)
- Fish (over 500 different species)
- Corals (over 150 species)
- Other marine flora/fauna
- Key ecosystem services to other sectors (soils stabilisation, water purification, etc)

Potential impacts of the hazards on the vulnerable assets

As for trees, plant species more generally each have distinct moisture dependence and temperature tolerance - increases in temperature and changes in precipitation patterns will therefore impact forest health and forest growth.

Impacts may manifest in one or more of the following way:

- Increasing temperatures and decreasing precipitation are likely to result in drought, which in turn can contribute to forest fires.
- Changing climatic conditions (in particular increasing temperatures) may impact the spread of forest disease.
- Extreme heat can cause heat stress in animals and subsequent migration or death. Extreme heat or heatwaves may also cause wildfires.

In freshwater ecosystems, increases in temperature will enhance evaporation of surface waters, while decreases in precipitation (and shifts in seasonal precipitation patterns) are likely to reduce stream flow - these changes are likely to reduce water supply to freshwater ecosystems in Wadis. This is likely to result in the loss of species or whole freshwater ecosystems.

Increase in surface air temperature are likely to be accompanied by an increase in water temperature. When conditions such as the temperature change, corals expel the symbiotic algae living in their tissues, responsible for their colour. A spike of 1–2°C in ocean temperatures sustained over several weeks can lead to bleaching, turning corals white. If corals are bleached for prolonged periods, they eventually die. The fish ecosystem will be affected as well and fish production will be decreased. These impacts will affect ecosystems, commercial fisheries, and possibly tourism.

2.3.6 Health sector risks

Having identified potential hazards, their likelihood and magnitude, sectors were provided a risk score from 1 to 5 (least to most at risk). The risk score reflects the exposure of key vulnerable assets to hazards and the resulting potential impacts, and the likelihood of the hazards occurring.

Table 2-23 shows the outcome of this assessment for the health sector.

Table 2-23 Results from the health sector risk assessment, by subsector and regions

Sector	Overall risk	Sub-sectors (regions)	Risk
Health	4.5	Physical health (S)	5
		Physical health (N)	4

Vulnerable assets exposed

In the health sector, the following assets are directly exposed to climate hazards:

- Human population (~10million people in Jordan)
- Medical practitioners and services providers
- Health infrastructure

Potential impacts of the hazards on the vulnerable assets

Temperature rise and changes in precipitation patterns could increase water scarcity and subsequent incidence of water-borne diseases, air-borne and respiratory diseases. An increased number of days with extreme precipitation may also increase the occurrence of flash floods, which can cause significant injuries and fatalities.

In Jordan, under a high emissions scenario, heat-related deaths in the elderly (65+ years) are projected to increase to about 54 deaths per 100,000 by 2080 compared to the estimated baseline of under 3 deaths per 100,000 annually between 1961 and 1990. A rapid reduction in global emissions could limit heat-related deaths in the elderly to about 11 deaths per 100,000 in 2080.

Health impacts may also arise from indirect mechanisms such as illness due to warmer temperatures and a more variable climate can malnutrition caused by cc impact on agricultural production and food

availability, the availability of clean water and sanitation, and the transmission of vector and water-borne diseases.

The impacts of temperature increases and changing precipitation patterns on agricultural output may also impact national food security, which in turn could impact human health (i.e., malnutrition).

2.3.7 Built infrastructure risks

Having identified potential hazards, their likelihood and magnitude, sectors were provided a risk score from 1 to 5 (least to most at risk). The risk score reflects the exposure of key vulnerable assets to hazards and the resulting potential impacts, and the likelihood of the hazards occurring.

Table 2-24 shows the outcome of this assessment for the built infrastructure sector.

Table 2-24 Results from the built infrastructure sector risk assessment, by subsector and regions

Sector	Overall risk	Sub-sectors (regions)	Risk
Built Infrastructure	4.5	Other (Aqaba)	4
		Other (Amman/Salt)	5
		Buildings (N)	5
		Buildings (S)	4

Vulnerable assets exposed

In the built infrastructure, the following assets are directly exposed to climate hazards:

- Infrastructure (transport, drainage systems, water supply etc)
- Transportation infrastructure,
- Tourism infrastructure (hotels and restaurants)
- Imports and exports storage facilities which may affect supply (ie. key manufacturing facilities)
- Buildings (~19,000 households)
- Residential buildings (housing a population of ~10million)
- Commercial buildings

Potential impacts of the hazards on the vulnerable assets

Extreme weather events, floods, or snowstorms could cause damage to houses and shops, resulting in economic losses and fatalities/injuries. These impacts are likely to affect citizens, businesses, and tourism.

It is mostly poor communities that live near Wadis and downstream, so impacts are likely to be greater for them.

2.3.8 Transport risks

Having identified potential hazards, their likelihood and magnitude, sectors were provided a risk score from 1 to 5 (least to most at risk). The risk score reflects the exposure of key vulnerable assets to hazards and the resulting potential impacts, and the likelihood of the hazards occurring.

Table 2-25 shows the outcome of this assessment for the transport sector.

Table 2-25 Results from the transport sector vulnerability assessment, by subsector and regions

Sector	Overall risk	Sub-sectors (regions)	Risk
Transport	5.0	Roads (N)	5
		Roads (S)	5

Vulnerable assets exposed

In the transport sector, the following assets are directly exposed to climate hazards:

- Infrastructure (approx. 8000 km of roads in Jordan, airport)

- Imports and exports, supply chain, tourism, airplanes and public transport vehicles, road infrastructure
- Economy (transport accounts for more than 8% of Jordan's GDP)
- Supply chains,
- Livelihoods/People (approx. 90% of Jordan's population (of ~10million) live in urban areas)

Potential impacts of the hazards on the vulnerable assets

Climate change is likely to damage transportation infrastructure through higher temperatures, more severe storms and flooding, and higher storm surges, affecting the reliability and capacity of transportation systems. Airplanes and public transport vehicles prone to weather impacts have an increased risk of malfunctioning and/or being damaged.

All forms of transport are affected by high temperatures. In particular, road surfaces can soften, rut and even melt under high temperatures.

Imports and exports through airports or seaports maybe disrupted due to extreme weather events and this may affect supply

Such disruptions can impact the livelihoods of the Jordanian population. Tourism will also likely be indirectly affected by those impacts.

2.3.9 Energy sector risks

Having identified potential hazards, their likelihood and magnitude, sectors were provided a risk score from 1 to 5 (least to most at risk). The risk score reflects the exposure of key vulnerable assets to hazards and the resulting potential impacts, and the likelihood of the hazards occurring.

Table 2-26 Table 2-18 shows the outcome of this assessment for the energy sector.

Table 2-26 Results from the energy sector risk assessment, by subsector and regions

Sector	Overall risk	Sub-sectors (regions)	Risk
Energy	4.5	Electricity	5
		Gas (Aqaba)	4

Vulnerable assets exposed

In the energy sector, the following assets are directly exposed to climate hazards:

- Households (~2 million)
- Hospitals
- Businesses
- Industry
- Water pumping at the national level (accounting for around 15% of the total consumption)
- Oil and gas imports (supplying 96% of Jordan's energy needs)

Potential impacts of the hazards on the vulnerable assets

Electricity consumption (and patterns of consumption) will be affected by increased occurrence of extreme temperatures. This could result in power shortages/outages, impacting households, businesses and individuals.

Extreme weather events and climate-related disasters (such as floods resulting from sea level rise or extreme precipitation) could disrupt oil and gas imports into Jordan. As Jordan relies on such imports for 96% of its energy needs, this could have severe impacts on the entire population and economy.

2.3.10 Business sector risks

Having identified potential hazards, their likelihood and magnitude, sectors were provided a risk score from 1 to 5 (least to most at risk). The risk score reflects the exposure of key vulnerable assets to hazards and the resulting potential impacts, and the likelihood of the hazards occurring.

Table 2-27 Table 2-18 shows the outcome of this assessment for the business sector.

Table 2-27 Results from the business sector risk assessment, by subsector and regions

Sector	Overall risk	Sub-sectors (regions)	Risk
Business	4.0	Sales and services (mainly Amman)	4
		Tourism (Petra, Dead Sea, Aqaba)	4
		Financial (mainly Amman)	4

Vulnerable assets exposed

In the business sector, the following assets are directly exposed to climate hazards:

- Economy (services account for over 70% of GDP, tourism accounts for 10%, and finance and banking accounted for 18.2% of GDP in 2015)
- People (employees, business owners)
- Transport infrastructure (roads, airports etc)
- Wastewater treatment (sewers, WWTPs)

Potential impacts of the hazards on the vulnerable assets

Extreme temperatures affect electricity consumption and patterns of consumption, potentially causing shortages or outages which can negatively impact businesses.

Increases in intensity or in the number of days with extreme precipitation may increase the occurrence of flash floods. Petra, Aqaba and the Dead Sea region have already suffered significant impacts from flash floods. Impacts include damage to buildings and infrastructure, economic losses for businesses, injuries and fatalities. Wastewater treatment plants may also be flooded, affecting sanitation and health.

Recent experiences highlight the magnitude at which impacts of such disasters are felt. For example, in Amman:

- Flash floods or snowstorms overwhelm the city due to poor infrastructure and readiness.
- Heavy rain inundates parts of downtown
- Shops in lower areas in city centre severely impacted.
- Over 100 Amman shops claimed damage after recent flooding.

Sea level rise may also cause flooding and damage to buildings and infrastructure in Aqaba (Jordan's only coastal region).

2.3.11 Manufacturing sector risks

Having identified potential hazards, their likelihood and magnitude, sectors were provided a risk score from 1 to 5 (least to most at risk). The risk score reflects the exposure of key vulnerable assets to hazards and the resulting potential impacts, and the likelihood of the hazards occurring.

Table 2-28 shows the outcome of this assessment for the manufacturing sector.

Table 2-28 Results from the manufacturing sector risk assessment, by subsector and regions

Sector	Overall risk	Sub-sectors (regions)	Risk
Manufacturing	3.5	Plastics and plastic products (N)	4
		Plastics and plastic products (S)	3
		Other (N)	4
		Other (S)	3

Vulnerable assets exposed

In the manufacturing sector, the following assets are directly exposed to climate hazards:

- Factories
- Economy (~20% of GDP in 2018) and exports revenues of 3.6 billion USD (2017)
- People (employees, business owners)

Potential impacts of the hazards on the vulnerable assets

Due to the wide geographic distribution of operations, climate change, including temperature and precipitation shifts as well as more frequent and severe extreme weather events, will have complex impacts on the sector. Climactic conditions will affect the stability and effectiveness of infrastructure and equipment, environmental protection and site closure practices, and the availability of transportation routes. Climate change may also impact the stability and cost of water and energy supplies.

Extreme precipitation may cause flooding, which can damage factories and machinery and result in economic losses from both damage and lost business.

Temperature extremes affect electricity consumption, which may affect supply and prices.

2.3.12 Mining and quarrying sector risks

Having identified potential hazards, their likelihood and magnitude, sectors were provided a risk score from 1 to 5 (least to most at risk). The risk score reflects the exposure of key vulnerable assets to hazards and the resulting potential impacts, and the likelihood of the hazards occurring.

Table 2-29 shows the outcome of this assessment for the mining and quarrying sector.

Table 2-29 Results from the mining and quarrying sector risk assessment, by subsector and regions

Sector	Overall risk	Sub-sectors (regions)	Risk
Mining and Quarrying	3.3	Mining (N)	4
		Mining (SW)	3
		Quarrying (Jerash-Petra)	3

Vulnerable assets exposed

In the mining and quarrying sector, the following assets are directly exposed to climate hazards:

- Mines and machinery
- Economy (~20% of GDP in 2018) and exports revenues of the mining sector's exports were up to 1098 Million JD, which constituted 19.7% of the total national exports during 2018.
- People (employees, business owners)

Potential impacts of the hazards on the vulnerable assets

Due to the wide geographic distribution of operations, climate change, including temperature and precipitation shifts as well as more frequent and severe extreme weather events, will have complex impacts on the sector. Climactic conditions will affect the stability and effectiveness of infrastructure and equipment, environmental protection and site closure practices, and the availability of transportation routes. Climate change may also impact the stability and cost of water and energy supplies.

Extreme precipitation may cause flooding, which can damage mines and machinery, result in economic losses from both damage and lost business, and potentially injuries and fatalities.

Temperature extremes affect electricity consumption, which may affect supply and prices.

Note on the use of qualitative and quantitative data in the roadmap vulnerability and risk assessment:

The assessment undertaken here and explained more in **Annex 3**, utilises a qualitative approach. This ensured that the assessment could be undertaken rapidly and efficiently, where data was not available. This also avoids providing a false sense of certainty through the use of numbers, and also allows for some of the nuances and experiences to be captured.

However, future estimates of impacts using a mixture of both qualitative and quantitative assessments, could be done through the following steps:

5. Identify by sector all the factors that may make it sensitive to climate change and inform them quantitatively and qualitatively, as some factors may not be quantifiable (i.e. dependence on external resources may best be estimated qualitatively through stakeholder consultations).
6. Identify by sector all the factors that may make it able to adapt to climate change, and inform them quantitatively and qualitatively.
7. Identify by location (if appropriate) the slow-onset changes and potential hazards that will occur in Jordan. To avoid increasing the level of uncertainty, it is recommended that (i) the data is not focused on one preferred future but rather considers changes under all RCP scenarios, and (ii) that spatial disaggregation is not too granular as the smaller the scale, the greater the uncertainty
8. Identify by sector the assets that will be exposed to these slow-onset changes or hazards and estimate their importance quantitatively and qualitatively (cultural, economic, social importance)

At this stage, the sensitivity, adaptive capacity and exposure assessments give an insight into the magnitude of impacts that a given sector may experience. This provides a basis on which to identify which to prioritise action/investments.

To quantify the impacts economically, the LTS team should identify a list of economic indicators for each systems or asset exposed, identify their historical relationship with past climate, and estimate how much future values may deviate from historical relationship as a result of the changing climate, the level of vulnerability and the level of exposure.

Annex 4 – Review of LTS Modelling Tools

Key Terms

Key term	Definition
Assumption	An aspect of future development that is uncertain or hard to predict, and so must be estimated based on best available knowledge (with this estimation/assumption justified).
Backcast	Backcasting = deciding target conditions for the future then defining the actions needed in the present to achieve this
Energy System	All components related to the production, conversion, delivery, and use of energy (IPCC AR5, 2014)
Forecast	Forecasting = predicting the future based on analysis of current trends
Long-term	Long-term = to approx. 2050
Medium-term	Medium-term = to approx. 2030
Mitigation Potential	An estimation of the potential emissions reduction associated with a mitigation action
Model / Modelling	In this context, models are tools used to create abstractions of reality – they take a variety of forms based upon their function, structure, and degree of quantification. Modelling is the process of creating these abstractions of reality.
Optimisation	Optimisation is the act of rendering optimal (e.g. in this context, optimisation models act to minimise costs, or make them optimal) Optimisation routines = procedures used for finding the optimal solution for a problem related to software)
Parameter	A model parameter is a configuration variable that is internal to the model and whose value can be estimated from data. They are required by the model when making predictions. They are estimated or learned from data.
Pathways	Pathway = plausible trajectories of development in certain fields (e.g. policy and governance, socio-economical, technical, energy-industrial). They evolve over time and can be combined with other assumptions or conditions to create scenarios. Pathways and scenarios may be modelled (Pathways/Scenario modelling – where different assumptions are input into a model) and then the outputs analysed against each other to assess the different futures created by different development assumptions (Pathways/Scenario analysis).
Projections	An estimate or forecast of a future situation based on a study of present trends
Scenarios	Scenario = the integrated product of socio-economic, climate change, and climate-related policy assumptions, and is a plausible description of how the future might unfold. The assumptions that frame a scenario can be altered to provide a set of different scenarios. In this way, scenarios can help us to understand the possible range of alternative futures and the uncertainty associated with them.
Technological Pathway	A pathway of development that relies on a specific technology, or a set of specific technologies.
Tool	See “Model”

1 Introduction and overview

Objective: To carry out a global review of modelling tools/approaches that could be used for the preparation of LTS, and to assess their suitability for use in Jordan

Outputs: A section of the roadmap describing the recommended tool/tools for use in Jordan's LTS. The review methodology and the results from the review will be attached as an annex to the roadmap

As part of the development of the roadmap for the preparation of Jordan's long-term strategy (LTS) it is important to understand what the options are for key elements of the methodology. In particular, the modelling of the projected GHG emissions will form a key part of the LTS, and the selection of the modelling approach/tools is a key decision to be made.

This report provides a review of potential modelling approaches that could be used in Jordan to underpin the modelling of its projected GHG emissions. The review is impartial (our team have no vested interest in any specific tools or models) and aims to provide an objective assessment of the potential strengths and weaknesses of alternative options for use in the LTS.

To deliver this task we have built upon previous similar work carried out by Ricardo in relation to the modelling of emissions for Nationally Determined Contributions (NDCs). Specifically, a comparative review for GIZ of potential tools that could be used in the analysis of mitigation scenarios²⁴⁸. Whilst this previous study was concerned with NDCs, which are focused more on medium-term mitigation action, a number of the tools/models can also be applied to long-term strategies. Moreover, the analytical framework that was used to assess the relative strengths and weaknesses of the modelling approaches, was equally applicable here.

The Ricardo team also met with the World Bank's modelling team to ensure a well-aligned approach, building on lessons learned and experiences in other countries. We have also sought inputs from the Ministry of Environment, Ministry of Energy & Mineral Resources and other key stakeholders in Jordan who have undertaken and worked with relevant models in order to ensure alignment and tailoring of the assessment to needs.

There is a need for Jordan to understand how various modelling tools can help them develop and implement an LTS and understand the capabilities and limitations of different models with reference to different states of LTS development – through stakeholder engagement, vision/targets, policy development (options appraisal), implementation planning (forecasting & optimisation), and impact assessment. This assessment therefore needs look more generally at the role of modelling and accounting tools in supporting the framing and setting of long term goals, and then appropriate 'follow-on' tools and models that can be utilised for more in depth sector specific or complex modelling of pathways. As such, this report proceeds as follows:

- **Section 2 - Background and scoping**, provides an overview of the role of modelling in the LTS process, and practical considerations for model selection. It presents selected experiences from other countries.
- **Section 3 - Jordan's mitigation context** summarises current emissions, projections, and indicative long term mitigation pathways for Jordan.
- **Section 4 - Jordan's modelling context** sets out the previous work undertaken in Jordan and experience with models, and an assessment of country needs based on stakeholder consultation.
- **Section 5 - Modelling tool review**, summarises the models selected for review, the criteria for assessment and the findings, and the findings of the review.

²⁴⁸ Methodological approach towards the assessment of simulation models suited for the economic evaluation of mitigation measures to facilitate NDC implementation (Ricardo Energy & Environment, 2017). https://www.transparency-partnership.net/system/files/document/simmodel-methodological-approach-%28web%29_20180214.pdf

- **Section 6 - Recommendations**, presents summary recommendations for Jordan including a proposed modelling solution to meet the country's LTS development needs.

2 Background and scoping

This section considers the role of modelling in an LTS, and the modelling approaches and use of models in other countries to help inform the review and recommendations for Jordan.

2.1 Role of modelling in the LTS process

Modelling has an important role in supporting international climate reporting by providing evidence that informs the plans, policies and targets that are included biennial update reports (BURs), national communications (NCs), and nationally determined contributions (NDCs) by many countries. Modelling can also play a crucial role in the formulation of LTSs, by supporting the assessment of potential long-term development pathways. This section considers the key elements of an LTS, and the role of modelling in each.

2.1.1 Key elements of an LTS

The World Resources Institute (WRI)²⁴⁹ has produced a set of recommendations for the key elements that should be included in a long-term climate strategy (LTS). While there is no “one size fits all” format or structure, the following elements should be included:

- **A long-term vision**
- **Sustainable development considerations**
- **Mitigation elements**
- **Adaptation elements**
- **Sectoral strategies**
- **Implementation approaches**
- **Monitoring plans and revision processes**

Some of these elements might form specific sections within the LTS e.g. vision statement, mitigation pathways, whereas others will be embedded in different elements e.g. sectoral strategies will be relevant to both the adaptation elements and the mitigation elements (with the relative importance of a given sector potentially varying in each case).

Models are used to support key components of this complex process²⁵⁰, to compute the potential future evolution of a value or set of values²⁵¹. However, what these values are is determined by the political and social process – ensuring there is a robust engagement process to ascertain these is as important as the values themselves. Modelling therefore has a critical role in the process of formulating an LTS but is a complementary role to other more important processes²⁵².

The LTS vision should describe the overall aspiration or goal of the LTS in a way that is simple, transparent and easy to communicate. This may include a specific quantitative goal for the emissions development pathway (e.g. reduction of GHG emission by X% by Y date). The process for developing

²⁴⁹ WRI (no year), “What is a Long Term Strategy?": <https://www.wri.org/climate/what-long-term-strategy#:~:text=These%20strategies%20set%20out%20long,analyzes%20long%2Dterm%20strategy%20submissions>.

²⁵⁰ Novikova, V., Fuessler, J., Molnar, M. and Osama Abdel-Aziz, A. (2016) 'Compendium on greenhouse gas baselines and monitoring National-level mitigation actions. UNFCCC. Available at: https://unfccc.int/files/national_reports/non-annex_i_natcom/cge/application/pdf/final-compendium-mitigation-actions.pdf

²⁵¹ Intergovernmental Panel on Climate Change (IPCC). (2018). Annex I: Glossary [Matthews, J.B.R. (ed.)]. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Available at: <https://www.ipcc.ch/sr15/chapter/glossary/>

²⁵² For example, in the context of Jordan this also includes citizen engagement

the vision will typically involve analytical work (i.e. to assess what is possible) but importantly this will need to be accompanied by engagement with stakeholders (i.e. to explore the level of ambition).

The vision and the mitigation pathways are intrinsically linked – it is possible to set a vision without a pathway, but a pathway is useful to determine what is possible (quantitatively). This is where modelling plays its most central role in the LTS development process. Once the end result (i.e. the vision) is determined and what this end result might look like politically, socially and economically is defined, there is a need to evaluate how to physically get there, considering how much certain options might cost and the impact of implementing those options on other elements of the system being modelled.

Modelling can be used to explore potential low emission development pathways (i.e., scenario analysis) and to help determine what might be an achievable goal in the vision setting process. The range of approaches are explained later in the document, but can include conducting a mitigation potential analysis of identified measures, to modelling technological pathways, perhaps using a single, economy-wide model or separate sector specific models. Modelling is not a pre-requisite of developing a vision however, other than having a good understanding of long-term trends of population, expected growth, emissions and climate variables. A top-down economy-based model might be used to project broad economic scenarios to account for and incorporate sustainable development considerations, determining what the economy would look like under defined scenarios, for example. This can be done with general equilibrium models.

Modelling also feeds into sectoral strategies – this might be undertaken at sector level – defining sector decarbonisation pathways for example – or at the most simple level will incorporate elements (energy technologies, efficiency and behaviours for example) that are applicable to different sectors, and therefore form part of those strategies. The sectoral narratives would require a suite of tools whose main objective would be to help the government understand transition risk and technology change and its links to policy on the one hand, and climate risk and resilience on the other.

Lastly, the “implementation” part (the policy making process) requires yet another set of tools to enable governments to understand short term sectoral economics and plan and deploy policy options. The LTS role would be to set a framework for using the tools and policy recommendations following the results of modelling at the time of preparing the LTS.

2.2 Practical considerations when selecting a model

There are numerous practical considerations that should be taken into account when selecting which models to use when developing an LTS. The following sections describe some of the main considerations, including the challenges of modelling, the need to consider the end goal or research focus, the need to consider national circumstances, and the different types of models that are available.

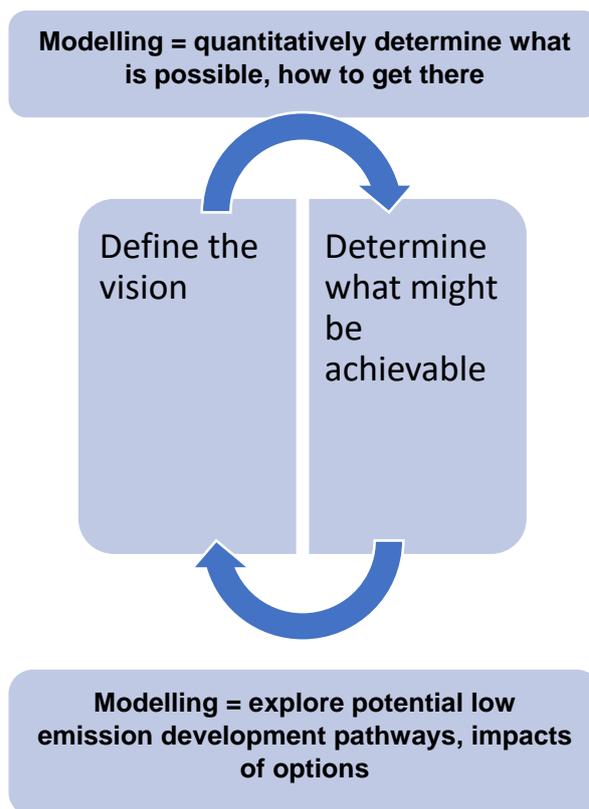


Figure 48: Role of modelling in LTSs

Source: Developed by Ricardo Energy and Environment

The key factors that influence the choice of the model can be summarized as follows²⁵³:

- **National circumstances (sectoral breakdown, carbon intensity and population size, magnitude of emission reductions compared with total baseline emissions)**
- **Objective of developing the baseline and mitigation scenarios (the end goal or research focus)**
- **Data availability and uncertainties that will impact the quality of the modelling**
- **Resources and capacity available to undertake the modelling**

2.2.1 National circumstances

When selecting which model to use, the fundamental characteristics of Jordan's national conditions should be primary deciding factors²⁵⁴. Such characteristics may include:

- Structure of the economy
- Industrialisation level
- Population size
- Level of expertise and institutional background
- Country data availability

Depending on the structure of the economy and scale of economic activity on the one hand, and the level of expertise, institutional background (e.g. existing agencies, existing research initiatives and past modelling experience) and data availability on the other hand, the choice can be made between simpler and more complex models. The more complex an economy, the more complex the model required to obtain reliable results.

Another important consideration for model selection is the expected magnitude of national emissions reductions²⁵⁵ – if the expected emission reductions from the planned mitigation actions are relatively small compared with the total baseline emissions, a higher precision in estimating the baseline emissions may be required, and a robust estimation is necessary (i.e., a more detailed modelling approach is required). On the other hand, a more detailed modelling approach is often more data-intensive, which leads to higher transaction costs for data collection. Consideration therefore needs to be given to whether the magnitude of emission reductions and the importance of mitigation actions justify the resources needed to use a detailed model to estimate the expected emission reductions from that mitigation action.

2.2.2 Types of models and desired end goal

Types of models are most often categorised by whether they approach the system that they are modelling from the top-down or the bottom-up, where:

- Top-down models evaluate the system from aggregate economic variables
- Bottom-up models consider technological options or project-specific climate change mitigation policies²⁵⁶

A useful way of thinking about this is that top-down models are derived from *aggregated data* and bottom-up models from *disaggregated data*. An approach that is often used is to combine a top-down and a bottom-up approach to form a hybrid approach. There are also tools exactly for this (hybrid models). Unfortunately, this simple distinction is not universal and there are other types of model “that

²⁵³ GIZ (2017), “Methodological approach towards the assessment of simulation models suited for the economic evaluation of mitigation measures to facilitate NDC implementation”: https://d1v9sz08rbysvx.cloudfront.net/ee/media/assets/simmodel-methodological-approach-web_20180214.pdf

²⁵⁴ Novikova, V., Fuessler, J., Molnar, M. and Osama Abdel-Aziz, A. (2016) ‘Compendium on greenhouse gas baselines and monitoring National-level mitigation actions. UNFCCC. Available at: https://unfccc.int/files/national_reports/non-annex_i_natcom/cge/application/pdf/final-compendium-mitigation-actions.pdf

²⁵⁵ Novikova, V., Fuessler, J., Molnar, M. and Osama Abdel-Aziz, A. (2016) ‘Compendium on greenhouse gas baselines and monitoring National-level mitigation actions. UNFCCC. Available at: https://unfccc.int/files/national_reports/non-annex_i_natcom/cge/application/pdf/final-compendium-mitigation-actions.pdf

²⁵⁶ New Climate Institute (2019) “Sector Decarbonisation Pathways From Different Angles: Technology, Modelling, Politics”: <https://newclimate.org/2019/06/12/sector-decarbonisation-pathways-from-different-angles-technology-modelling-politics/>

cannot be neatly labelled as top down, bottom up or hybrid models, although in practice they may provide the facilities that enable the user to build top down or bottom up models.”²⁵⁷ An example of this are accounting modelling tools, which are generally classified as bottom-up however can be used to build top down models.

When selecting a model, it is important to consider the end goal and/or research focus of the modelling exercise. For example, some countries have used models to understand the economic impacts of mitigation actions, some have used models primarily for exploring different mitigation pathways, and for others it may be more important to be able to model different technology options.

Such considerations should ultimately inform model choice, as different models are optimal for different uses. For example, top-down models (such as Integrated Assessment Models (IAMs) and computable general equilibrium (CGE) models) tend to take a broader view of the economy and can simulate interactions between different economic sectors to better understand the impact on macroeconomic variables such as, for example, GDP, employment, government spending etc. In contrast, bottom-up models focus on technologies, and are therefore often more granular than top-down models – they may or may not include optimisation routines, and can be useful for quantifying policies that impact specific sectors and technologies. Hybrid models try to combine these two, including technology detail and also exploring the macroeconomic effects²⁵⁸.

A summary of the main top down and bottom up model types is provided below in Table 30. (In Table 31, in section 2.3 below, further details on the benefits and challenges of these models is provided, and hybrid models in Table 32).

Table 30: Summary of model types

Category	Type	Description
Bottom up	Accounting	Accounting models include descriptions of key performance characteristics of an energy system, which allows users to explore the implications of resource, environment and social cost decisions.
Bottom up	Simulation	Simulation models include a detailed representation of energy demand and supply technologies, including end-use, conversion, and production technologies.
Bottom up	Optimisation	Optimisation models minimise the total costs of the energy system, including all end-use sectors, over a 40 to 50 year horizon and compute a partial equilibrium for the energy markets.
Top down	Input-Output (I/O) Models	I/O models describe the complex interrelationships among economic sectors using sets of simultaneous linear equations
Top down	General Equilibrium (CGE) Models	CGE models typically simulate markets for factors of production (e.g., labour, capital, energy), products, and foreign exchange, with equations that specify supply and demand behaviour. The models are solved for a set of wages, prices, and exchange rates to bring all markets into equilibrium.
Top down	National IAM	IAMs bring the whole social economic system together and evaluate different population, economic and technological development pathways within an internally consistent,

²⁵⁷ GIZ (2017), “Methodological approach towards the assessment of simulation models suited for the economic evaluation of mitigation measures to facilitate NDC implementation”: [https://d1v9sz08rbysvx.cloudfront.net/ee/media/assets/simmodel-methodological-approach-\(web\)_20180214.pdf](https://d1v9sz08rbysvx.cloudfront.net/ee/media/assets/simmodel-methodological-approach-(web)_20180214.pdf)

²⁵⁸ New Climate Institute (2019) "Sector Decarbonisation Pathways From Different Angles: Technology, Modelling, Politics": <https://newclimate.org/2019/06/12/sector-decarbonisation-pathways-from-different-angles-technology-modelling-politics/>

		science-based framework with a view to evaluating the feasibility of different climate and/or sustainable development goals.
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2.2.3 Data and uncertainty

The New Climate Institute²⁵⁹ notes that “models cannot capture the full complexity of a transition to a low carbon economy, which includes technical, economical, behavioural, and political aspects, sector interactions, and more”. Each of these parameters has a certain level of uncertainty, which arises from a number of sources. Data availability, for example, frequently affects the level of uncertainty in model outputs. While more simple models may overcome the barrier of data availability by relying on fewer data points, they risk missing important variables (affecting the completeness of process representation). In contrast, more complex models account for numerous variables and potential inter-linkages, but this magnifies the risk of uncertainty and data unavailability.

Uncertainty in the modelling process also arises from assumptions that have to be made about core parameters (e.g. future GDP growth, technology availability, costs etc), which greatly influence the results of the modelling exercise and thus should be treated with care. For example, GDP growth is often used to determine future energy demand, greatly affecting energy supply projections and associated GHG emissions. The choice about the target level of future GDP growth is often a political decision, intended to present an optimistic view of future development. However, growth is hard to predict into the future with any degree of certainty, with uncertainty increasing as we try to predict further into the future.

Jordan will therefore need to consider some of the below in the selection of models and during the modelling process include:

- **Data availability:** ensuring that the minimum data requirements of a model can be met is fundamental to assessing its appropriateness for use, and also ensuring the data that is available is of sufficient quality to have confidence in the outputs. Often data availability (and quality) is the biggest determinant of a choice of model and method and data is a known challenge in Jordan.
- **Growth rates:** in modelling future pathways, models require assumptions to be made about e.g. Jordan’s future population and growth rate, GDP growth rate etc. Different assumptions can result in very different outputs. Both population and GDP rates have been uncertain in Jordan and as discussed in section 4 below, have been a challenge in past modelling work.
- **Finance:** this might include both the need to consider if the future costs of climate actions can be met, and also the financial implications of certain pathways e.g. the impacts of a reduction in fuel tax revenues.
- **Behaviour change:** this might include uncertainty in assumptions regarding average electricity consumption, tied to socioeconomic development of technological innovation for example, as well as broader issues such as the evolution of eating habits and the impacts of this on agriculture and energy, as Jordan continues to develop.
- **Climate impacts:** the impacts of future climate change might also impact future pathways, for example, rising temperatures or water scarcity issues exacerbated requiring greater use of energy for cooling or desalination.

2.2.4 Resource and capacity

Resource and capacity constraints will influence model selection, and the **following potential challenges/bottlenecks** should be considered:

- **Budget** (i.e., for purchasing any new software)
- **Technical capacity and in-country expertise**

²⁵⁹ Ibid.

- **Institutional background** (e.g., existing agencies, existing research initiatives, past modelling experience)

For example, a case study into the use of models during India’s NDC preparation²⁶⁰ notes that the model chosen (MARKAL) was selected based on existing in-country experience with this model – a core team of 4-5 MARKAL modellers supported by around 800 sector and technology experts, who have used MARKAL for two decades. As such, Jordan should consider which models would best fit existing resources and capacity in the country.

2.2.5 Downscaling to the national/sectoral level

In practice countries are more likely to develop pathways based on national circumstances and national data, rather downscaling from global scenarios. However, global pathways can be used to inform national and sector level pathways²⁶¹. Such an exercise is difficult and relies on many assumptions. For example, the IPCC special report²⁶² on 1.5°C presented a range of Paris Agreement compatible IAM-based pathways to keep global warming below 2°C and close to 1.5°C. In order to break this down to national Paris Agreement compatible pathways, the approaches to equity (or fairness) in Box 13 may be used²⁶³.

- 1. Equity based on RESPONSIBILITY:** This fundamental definition of equity is based upon the “polluter pays” principle. Under this approach, historical emissions are used to derive emission goals (i.e., historically greatest emitters take on a larger share of responsibility/burden). This may advocate for a staged approach to carbon budget allocation, with high emitting countries/sectors adopting reduction targets earlier than low emitting countries/sectors.
- 2. Equity based on EQUALITY:** This is also often referred to as an “egalitarian” approach. It may seem odd that “equality” is an approach to “equity” (or “fairness”), but the two do not mean the same thing. For example, would it be considered fair if all countries were assigned the exact same mitigation targets, regardless of their historical emissions and/or financial capability? In this approach, equality usually refers to per capita emissions, advocating for a “contraction and conversion” based approach to budget allocation, whereby overall emissions of greenhouse gases are reduced to a safe level (contraction) resulting from every country bringing their per capita emissions to a level which is equal for all countries (convergence). This approach means historically high emitters tend to face an increased burden, and historically low emitters are allocated a certain amount of “fair air”.
- 3. Equity based on CAPABILITY (OR NEEDS):** This definition of equity refers not only to financial capability (e.g. wealthier countries/sectors with higher GDP can take on the costs of mitigation more easily), but also to broader human development (e.g. considering the development needs of different countries, often via their Human Development Index score). “Capability” may also encompass mitigation potential. This approach could be easily scaled down for use at a national/sectoral (rather than international) scale – for example, a country with goals to enhance access to electricity could exempt their energy sector from immediate or stringent mitigation targets based on their development needs. This approach safeguards the right to sustainable development for developing countries (i.e., the need for equitable access to development).
- 4. Equity based on COSTS:** This definition of equity is not a stand-alone category, but falls under the umbrella of “capability”. We detail this definition separately because it focuses on ensuring equal absolute costs to each country/sector, whereas capability focuses more on relative costs (e.g. the same absolute cost has a greater relative impact where GDP is lower). Marginal abatement costs may be calculated for a number of mitigation pathways, allowing evaluation of which option(s) will result in equal or optimal costs to each sector.

Box 13: Approaches to downscale global scenarios (IPCC (2014) AR5 WG3, Chapter 6).

²⁶⁰ GIZ (2017), “Methodological approach towards the assessment of simulation models suited for the economic evaluation of mitigation measures to facilitate NDC implementation”: [https://d1v9sz08rbysvx.cloudfront.net/ee/media/assets/simmodel-methodological-approach-\(web\)_20180214.pdf](https://d1v9sz08rbysvx.cloudfront.net/ee/media/assets/simmodel-methodological-approach-(web)_20180214.pdf)

²⁶¹ Novikova, V., Fuessler, J., Molnar, M. and Osama Abdel-Aziz, A. (2016) ‘Compendium on greenhouse gas baselines and monitoring National-level mitigation actions. UNFCCC. Available at: https://unfccc.int/files/national_reports/non-annex_i_natcom/cge/application/pdf/final-compendium-mitigation-actions.pdf

²⁶² IPCC (2019), “Special Report: Global Warming of 1.5°C”. https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_Low_Res.pdf

²⁶³ IPCC (2014) AR5 WG3, Chapter 6, Available from: https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter6.pdf

2.3 Benefits and challenges of different models

Different models have different structures and different levels of complexity – these differences mean that each model is best suited to different uses. The benefits and challenges of different specific top-down and bottom-up model types are summarised in Table 31 and then the benefits and challenges of different hybrid modelling approaches are summarised in Table 32.

Table 31: Overview of different model types²⁶⁴²⁶⁵²⁶⁶²⁶⁷²⁶⁸

Model type	Benefits of model type	Challenges of model type
<p>Accounting</p> <p>Category: Bottom-up</p> <p>Examples: LEAP, GACMO</p> <p>Description: Accounting models include descriptions of key performance characteristics of an energy system, which allows users to explore the implications of resource, environment and social cost decisions.</p>	<ul style="list-style-type: none"> • Allows the user to disaggregate all the major energy using and supplying sectors in a given region and balance energy supply and demand • Often simple in terms of investment and often including no prior assumptions about market behavior or optimal choices and little to no sectoral and technological detail. This allow for scenario analysis that is approachable by stakeholders. • Simplicity allows for a relatively less steep learning curve than other modelling systems. • Accounting frameworks are the most transparent and easiest to us, allowing the user to build simple models initially, which can be developed into more detailed models at a later date. • They also seem to be the main method for assessing non-energy emissions (e.g. LULUCF as a linked model to other modelling approaches). 	<ul style="list-style-type: none"> • Simplicity – less able to account for interlinkage between different components of a system. • No theoretical or practical underpinning by which to forecast the effect of policy shocks on the economy or energy system in general. • Their use is limited for assessing the impact of market-based policies, e.g. performance mechanisms, cap and trade, and carbon taxes, not just for the direct impacts on emissions but follow-on effects of financial recycling methods.

²⁶⁴ Hare, B., Brecha, R. and Schaeffer, M. (2018). Integrated Assessment Models: what are they and how do they arrive at their conclusions? Climate Analytics. Available at: https://climateanalytics.org/media/climate_analytics_iam_briefing_oct2018.pdf

²⁶⁵ Novikova, V., Fuessler, J., Molnar, M. and Osama Abdel-Aziz, A. (2016) 'Compendium on greenhouse gas baselines and monitoring National-level mitigation actions. UNFCCC. Available at: https://unfccc.int/files/national_reports/non-annex_i_natcom/cge/application/pdf/final-compendium-mitigation-actions.pdf

²⁶⁶ Pye, S. and Bataille, C. (2016) 'Improving deep decarbonisation modelling capacity for developed and developing country contexts', *The Deep Decarbonization Pathways Project: Insights and Emerging Issues*, 16(1), pp. S27-S46. Available at: <https://core.ac.uk/download/pdf/79523551.pdf>

²⁶⁷ Haydock, H and McCullough, A. 2017. Methodological approach towards the assessment of simulation models suited for the economic evaluation of mitigation measures to facilitate NDC implementation. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. Available at: https://www.transparency-partnership.net/system/files/document/simmodel-methodological-approach-%28web%29_20180214.pdf

²⁶⁸ UNFCCC. Integrated Assessment Models (IAMs) and Energy-Environment-Economy (E3) models. Available at: <https://unfccc.int/topics/mitigation/workstreams/response-measures/integrated-assessment-models-iams-and-energy-environment-economy-e3-models>

	<ul style="list-style-type: none"> • Good entry level tools to bottom-up (B-U) and B-U hybrid models, which allow policy, costing, and some investment analysis. 	
<p>Simulation</p> <p>Category: Bottom-up</p> <p>Examples: POLES, AERO</p> <p>Description: Simulation models include a detailed representation of energy demand and supply technologies, including end-use, conversion, and production technologies.</p>	<ul style="list-style-type: none"> • A bottom up simulation model is often a useful starting point for exploring how energy is used in particular sectors and for understanding how different mitigation measures and technology options influence sectoral GHG emissions. • Demand and technology development are driven by scenario assumptions often linked to technology vintage models and econometric forecasts. • The demand sectors are generally disaggregated for industrial subsectors and processes, residential and service categories, transport modes, etc. This allows development trends to be projected through technology development scenarios. 	<ul style="list-style-type: none"> • As they are often sector-specific they can be limited in their application. • They are best suited for short- to medium-term impact assessment studies. • Limited technology representation can make comparison with other bottom-up technology driven models difficult
<p>Optimisation</p> <p>Category: Bottom-up</p> <p>Examples: MARKAL/TIMES, MESSAGE</p> <p>Description: Optimisation models minimise the total costs of the energy system, including all end-use sectors, over a 40 to 50 year horizon and compute a partial equilibrium for the energy markets.</p>	<ul style="list-style-type: none"> • Very detailed, often economy wide, linked maps of energy use from supply through end use demand • Integrated full system representation • Explicit recognition of capital, operating and fuel costs which provides a basis for least cost analysis, normally based on a financial discount rate. Costs include investment and operation costs of all sectors based on a detailed representation of factor costs and assumptions about GHG emission taxes. • Their technical depth and capacity for modelling capital stock turnover means they can also model the effects of technology regulations, a common requirement of decision makers and typically a weakness of top-down models 	<ul style="list-style-type: none"> • Data intensiveness • Behavioural simplicity (cost minimization based on financial discount rates does not completely describe firm and household behaviour) • Exogenous demands for energy services • Lack of capacity to model the financial recycling effects of emissions charges • Relatively steep learning curves

	<ul style="list-style-type: none"> • During NDC preparation, they could be used to assess the dynamic aspects of GHG emissions reduction potential and costs, and to model the relative economic cost-effectiveness of a wider range of mitigation measures in different sectors. 	
<p>Input-Output (I/O) Models</p> <p>Category: Top-down</p> <p>Examples: IOTA, REMI</p> <p>Description: I/O models describe the complex interrelationships among economic sectors using sets of simultaneous linear equations.</p>	<ul style="list-style-type: none"> • They take aggregate demand as given and provide considerable sectoral detail on how demand is met. • They are used when the sectoral consequences of mitigation or adaptation actions are of particular interest. • They may be useful in exploring supply chain dependences between different sectors. 	<ul style="list-style-type: none"> • The validity of the models is limited to short runs (5–15 years). • As the coefficients of the equations used in I/O models are generally fixed, they are not able to model factor substitution, behavioural aspects or technological change.
<p>General Equilibrium (CGE) Models</p> <p>Category: Top-down</p> <p>Examples: EPPA, ICES</p> <p>Description: CGE models typically simulate markets for factors of production (e.g., labour, capital, energy), products, and foreign exchange, with equations that specify supply and demand behaviour. The models are solved for a set of wages, prices, and exchange rates to</p>	<ul style="list-style-type: none"> • General equilibrium models consider simultaneously all the markets in an economy, allowing for feedback effects between individual markets. Such models are used to study the energy sector as part of the overall economy and focus on interrelations between the energy sector and the rest of the economy. • Comprehensive analytical strength: good for energy policy assessment (regulation, taxation, etc.) • CGE models are typically used to simulate markets for factors of production (e.g., labour, capital, energy), products, and foreign exchange, with equations that specify supply and demand behaviour. • During the NDC preparation process, they have been used to simulate the effect of price-induced substitution 	<ul style="list-style-type: none"> • Highly sensitive to accurate estimation of substitution elasticities • Lacks detailed technological data • Places restrictive assumptions on production functions • Understates transition costs when a switch from one technology to another is modelled • CGE models examine the economy in different states of equilibrium and so are not able to provide insight into the adjustment process • However, as the parameters in CGE models are only partly calibrated (i.e., fitted to one year of data) and only partly statistically or econometrically determined (i.e., estimated from several years of data), it can be

<p>bring all markets into equilibrium.</p>	<p>away from or towards energy-intensive products in response to policy changes.</p>	<p>difficult to defend the validity of some of the parameter values. Hence other types of modelling are likely to be needed to support the development of a detailed implementation plan.</p>
<p>National IAM</p> <p>Category: Top-down</p> <p>Examples: ETSAP-TIMES IAM (TIAM), ASF</p> <p>Description: IAMs bring the whole social economic system together and evaluate different population, economic and technological development pathways within an internally consistent, science-based framework with a view to evaluating the feasibility of different climate and/or sustainable development goals.</p>	<ul style="list-style-type: none"> • National Integrated Assessment models (IAMs) are full economy models that also include atmospheric GHG and energy balancing components to allow for temperature change targets, and in some cases include damage functions. • These models have detailed sectoral and regional classifications that can be useful in assessing the impacts of economic diversification and trade and spillover impacts. 	<ul style="list-style-type: none"> • National circumstances are often simplified to the point where they are not useful for national policy debates • Would typically be difficult to use successfully by national groups wanting to inform their national debates, due to their complexity and lack of national granularity. • Less well equipped to address technological development. • Steep learning curve

Table 32: Overview of different hybrid model types²⁶⁹

Hybrid model type	Benefits	Challenges
Bottom-up based hybrid	<ul style="list-style-type: none"> Bottom-up based hybrids such as MARKAL Elastic Demand (ED) and MARKAL-MACRO attempt to include key top-down dynamics (e.g. behavioural realism through demand adjustment in the face of policy changes as well as the use of maximization of producer and consumer's surplus in the case of ED and MACRO variants of MARKAL-TIMES) in what is otherwise a bottom-up framework. 	<ul style="list-style-type: none"> All the bottom-up hybrids share the challenges of having a limited depiction of non-energy system structural change; given a strong policy, while they can capture some economic restructuring, they simply cannot capture the full economy wide pricing, trade and economic structure effects. Steep learning curve
Mixed linked (B-U + T-D)	<ul style="list-style-type: none"> Mixed soft-linked and hard-linked models, instead of trying to directly incorporate bottom-up (B-U) and top-down (T-D) attributes, link established B-U and T-D frameworks. These frameworks typically have the advantage of using existing models, typically "soft-linked" (i.e. there is no direct coded connection, but parameters are passed back and forth). 	<ul style="list-style-type: none"> These frameworks, not having been designed together, will typically be challenged with boundary issues, i.e. overlapping coverage of systems and their dynamics. Steep learning curve
Top-down based hybrid	<ul style="list-style-type: none"> Top-down based hybrids are distinct from typical CGE models in that they have a recognized need for technological explicitness to represent fundamental changes, especially in the electricity system. Top-down hybrids have one key advantage over bottom-up hybrids, in their capacity to model the full impacts on GDP, employment and economy structural change by climate policies, and especially the capacity to accurately simulate the recycling method for carbon pricing, which has a large final effect on policy emissions and economic impact 	<ul style="list-style-type: none"> Their key weakness is their inability to accurately model detailed technology regulations, which can be imperfectly ameliorated by more sophisticated production function nesting. Steep learning curve

²⁶⁹ Pye, S. and Bataille, C. (2016) 'Improving deep decarbonisation modelling capacity for developed and developing country contexts', *The Deep Decarbonization Pathways Project: Insights and Emerging Issues*, 16(1), pp. S27-S46. Available at: <https://core.ac.uk/download/pdf/79523551.pdf>

2.4 Modelling experience of other countries

There is a huge range of modelling approaches used globally for the purposes of creating a long-term strategy or similar, with each country approaching the problem from a different context (as explained in Section 2.2).

2.4.1 Key factors influencing model selection

An assessment of the modelling experience of MENA (Middle East and North Africa) countries was conducted, exploring the Biennial Update Reports (BURs) and National Communications (NCs) of Egypt, Morocco, Turkey, Azerbaijan and Saudi Arabia. None of these countries have yet submitted an LTS. Saudi Arabia did not explicitly state the use of any modelling. MENA countries have generally used bottom-up or accounting models, with all of the countries explored here using either TIMES (Egypt BUR; Turkey BUR) or LEAP (Morocco BUR/TNC; Azerbaijan BUR/TNC). Azerbaijan noted flexibility, transparency and user friendliness as key justifications of model choice, while the others did not explicitly state justification but implied that simplicity/user-friendliness were key deciding factors. The methodological approaches used by the MENA countries are broadly similar, with most using models for scenario analysis (often with a baseline scenario and a mitigation scenario) or to assess the mitigation potential of individual actions (e.g. increasing renewables in energy mix). Some countries (e.g. Azerbaijan) also used the model outputs to inform cost-benefit analyses.

Elsewhere, Nigeria and Colombia also chose to use LEAP (for the INDC modelling). Nigeria selected this model because of its low resource requirements and its relatively open source nature: “a LEAP model can be done relatively quickly and there was little time available to prepare the INDC. It was important that the model was not proprietary and could be transferred to others, and that it had been used in many other countries.”²⁷⁰

For Colombia, model selection was also based on existing resources and technical capacity. Various models were used to inform the INDC, including LEAP for the power sector, MARKAL, and Excel for the transport and forestry sectors. An overall Excel model then brought all sectors together. “These sector models were chosen because they were well understood and validated, and best represented the sectors concerned. Some of these models had also been used since 2011 for the development of the national low carbon strategy so information was available on mitigation scenarios and potential.”²⁷¹

For the development of India’s INDC they chose to use MARKAL due to a long history of the use of the model in country: the Indian modelling team “have a core team of 4-5 MARKAL modellers supported by around 800 sector and technology experts, and have used MARKAL for two decades”. The Energy and Resources Institute (TERI), a research institute in New Delhi that specializes in the fields of energy, environment and sustainable development, was responsible for the modelling and although also used the TIMES model, “chose MARKAL for the INDC work as this is the more established model.”²⁷² These considerations of familiarity and resourcing are key.

2.4.2 Models used in LTSs prepared to date

As noted, none of the MENA region countries above have yet submitted an LTS. Countries that had submitted an LTS and for which information was available (i.e. their modelling approach was stated), have been reviewed for their approach to modelling.

Table 33 below presents an overview of these modelling approaches and the specific models used by different countries in the development of their LTS. What this table shows very clearly is the **range of approaches taken**, with more developed countries focusing on an approach that uses a more complicated, resource, data and time intensive tool or combination of tools to capture and then integrate each component as their national circumstances permit. Conversely, other countries have used an

²⁷⁰ GIZ (2017), “Methodological approach towards the assessment of simulation models suited for the economic evaluation of mitigation measures to facilitate NDC implementation”: [https://d1v9sz08rbysvx.cloudfront.net/ee/media/assets/simmodel-methodological-approach-\(web\)_20180214.pdf](https://d1v9sz08rbysvx.cloudfront.net/ee/media/assets/simmodel-methodological-approach-(web)_20180214.pdf)

²⁷¹ Ibid.

²⁷² Ibid.

approach that focuses on a single tool or sector of the economy to achieve the most efficient outcome based on their national circumstances.

Table 33: Models used by different countries in the creation of their LTS²⁷³.

Country/LTS	Models used	Model category	Sector and/or applicability (as stated)
Mexico	EPPA	General equilibrium (CGE) model	Economic analysis (all sectors) and emissions projections (all GHGs)
	Balmorel model	Optimisation model (bottom-up)	Electricity sector
	CBM-CFS3	Accounting	Land use
Singapore	MARKAL	Optimisation model (bottom-up)	Modelling of possible mitigation pathways
UK	UK-TIMES	Optimisation model (bottom-up)	Scenario modelling (bottom-up)
Spain	TIMES-Sinergia	Optimisation model (bottom-up)	Energy system modelling (i.e., projections to 2050).
Costa Rica	TIMES-CR	Optimisation model (bottom-up)	Energy sector modelling
Fiji	LEAP	Accounting	Scenario modelling (bottom-up)
Finland	TIMES-VTT	Optimisation model (bottom-up)	Energy production and energy systems
	REMA model	Bottom-up	Energy consumption of the building stock
	DREMFIA model	Sectoral model (simulation)	Agriculture
	MELA software	Sectoral model (simulation)	Development of forest resources
	FINAGE software	General equilibrium (CGE) model	Economic trends
Austria	Climate Pathways Calculator	Accounting	Modelling of possible mitigation pathways
	TIMES-based model	Optimisation model (bottom-up)	Electricity sector calculations
	Dynamic New Keynesian Model	General equilibrium (CGE) model	Socioeconomic parameters and effects, conversion and final energy use
	NEMO model	Traffic Emissions Simulation	Energy consumption and emissions of the transport sector

²⁷³ All of the country LTSs investigated can be accessed here: <https://unfccc.int/process/the-paris-agreement/long-term-strategies>

	MARS model	Land-use Simulation	Traffic volumes and modal split
	INVERT/EE-Lab model	Bottom up with top down elements	Cooling, space heating, and water heating including electricity demand for households and services, district heating demand.
Sweden	TIMES-Sweden	Optimisation model (bottom-up)	Economic consequences of goals and actions

2.5 Summary of findings

2.5.1 Role of modelling

Modelling has an important role in supporting international climate reporting by providing evidence that informs the plans, policies and targets that are included biennial update reports (BURs), national communications (NCs), and nationally determined contributions (NDCs) by many countries.

Similarly, modelling can also play a crucial role in the formulation of LTSs, by supporting the assessment of potential long-term development pathways by computing the potential future evolution of a value or set of values. However, what these values are is determined by the political and social process. The values and their computation is less important than the process of how you got to the values in the first place.

Modelling therefore has a critical role in the process of formulating an LTS, but is also complementary to other more important processes beyond the technical exercise. Determining a long-term vision is one of these more important processes. This involves assessing what is possible technically but also engaging with stakeholders to explore what's feasible and practical. The modelling process can provide a strong evidence base for such stakeholder consultation, by quantifying the potential mitigation benefits and (if possible based on the model used) costs. Similarly, the modelling process can aid citizen engagement, by visualising concepts and transformations that may seem abstract to the wider public.

Modelling does not just play one role in the pathway development process, but can be a core component in several of the different steps. Modelling may help determine a long-term vision by enabling investigation into what extent of emissions reduction is feasible over a certain time-frame, and can also aid understanding of the sustainable development implications of mitigation measures (with the use of CGE models that explore socioeconomic parameters alongside emissions reductions). However, it is not a pre-requisite to determining the vision. Importantly, modelling also enables the investigation into *how* a country will achieve its long-term vision, by simulating the effects of a variety of mitigation actions and technological transformations. The outputs obtained from the modelling process can provide critical input to the development of sectoral strategies and implementation approaches, as well as formulating monitoring plans and revision processes.

The policy making process (“implementation”) then requires yet another set of tools to enable governments to understand short term sectoral economics and plan and deploy policy options. The LTS role would be to set a framework for using the tools and policy recommendations following the results of modelling at the time of preparing the LTS.

2.5.2 Practical considerations

There are numerous practical considerations that should be taken into account when selecting the models to be used to formulate Jordan's LTS.

These can broadly be categorised into four categories:

National circumstances – A comprehensive understanding of national conditions can allow selection of a model that is best suited to Jordan's needs (e.g. need to represent specific sectors or technologies) and constraints (e.g. data availability, expertise).

End goal – It is important for Jordan to understand what it wants to achieve with the modelling exercise. Is it to understand the economic impacts of mitigation actions, to conduct a mitigation potential analysis or to model different technology options. Different types of model are optimal for different uses, as explained further below. It will also be important to consider the objective of developing the baseline and mitigation scenario. Some countries might want to analyse a singular mitigation pathway, others might want to look at a range. Also the magnitude of emissions reductions will dictate the precision of the required tool.

Data and uncertainty - Uncertainty in the modelling process arises due to assumptions that have to be made about future development of key variables, e.g. growth rates, finance, behaviour change and climate impacts which are all very difficult to predict and therefore assumptions must be made and, where possible, be well justified. What data are available will therefore significantly affect the level of uncertainty in model outputs. While more simple models may overcome the barrier of data availability by relying on fewer data points, they risk missing important variables (affecting the completeness of process representation). In contrast, more complex models account for numerous variables and potential inter-linkages, but this magnifies the risk of uncertainty and data unavailability.

Resource and capacity - Resource and capacity constraints will influence model selection, and the following potential challenges/bottlenecks should be considered so that the tool/s selected best fits the budget, technical capacity and in-country expertise and institutional background of the country.

Jordan may also wish to consider whether they have any interest in (or use for) downscaling global pathways to the national and/or sectoral level, to explore what needs to be done to allow Jordan to effectively contribute to the achievement of global targets.

2.5.3 Types of models

Types of models are most often categorised by whether they approach the system that they are modelling from the top-down or the bottom-up - top down models evaluate the system from aggregate economic variables, while bottom up models consider technological options or project-specific climate change mitigation policies. Models may be further categorised according to the following:

Model type	Category	Examples
Accounting	Bottom-up	LEAP, GACMO
Simulation	Bottom up	POLES, AERO
Optimisation	Bottom up	MARKAL/TIMES, MESSAGE
Input-Output (I/O) Models	Top-down	IOTA, REMI
General Equilibrium Models	Top-down	EPPA, ICES
Natonal IAM	Top-down	ETSAP-TIMES IAM (TIAM), ASF

An approach that is often used is to combine a top-down and a bottom-up approach to form a hybrid approach. There are also tools exactly for this (hybrid models), which include technology detail while also exploring macroeconomic effects.

2.5.4 Modelling experience of other countries

A huge range of modelling approaches have been used by various countries for the purposes of creating a long-term strategy or otherwise, with each country approaching the problem from a different context.

An analysis of modelling experience within the MENA region revealed that these countries have generally opted to use bottom-up or accounting models, with the simplicity, flexibility, transparency, and user-friendliness of these types of models being the main justifications for their choices. The methodological approaches used by the MENA countries are also broadly similar - most use models for scenario analysis or to assess the mitigation potential of individual actions, with some countries also using the model outputs to inform cost-benefit analyses.

Elsewhere, LEAP has also been a popular choice due to its low resource requirements, its relatively open source nature, and its compatibility with existing resources and technical capacity. Many countries have also opted for a blended approach, whereby different tools are used for different sectors.

There is a range of approaches taken, with more developed countries tending to take an approach that uses a more complicated, resource, data and time intensive tool or tools as their national circumstances permit. Conversely, other countries have used an approach that focuses on a single tool or sector of the economy to achieve the most efficient outcome based on their national circumstances.

2.5.5 Conclusion

The process Jordan takes to the exercise of modelling is as important as the model/s that are selected to compute the parameters, however there are a set of important considerations that Jordan must take on in order to ensure that they select the most appropriate tool for the task they want to undertake and for their national circumstances. There are a range of possible modelling tools available, utilising different approaches and intended for different purposes, these can be used to support the development of a long- term strategy. A variety of approaches has been used by developing nations like Jordan for similar exercises and whilst these examples can be useful to draw upon, it is important that Jordan considers their constraints and capacities independently and selects an approach and tool/s that best fits their needs and circumstances and will allow the country to most effectively achieve their end goal.

3 Jordan's mitigation context and future pathways

As discussed in Section 2.2.1, it is important to consider national conditions when selecting the models to be used, and understand the possible transition pathways and actions that might need to be considered by Jordan. In the following sections we consider Jordan's emissions context, existing/available data and studies, and outline potential decarbonisation pathways based on Jordan's circumstances and international predictions.

3.1 Jordan's emissions

In selecting a model for use in formulating the LTS, it will be important to consider Jordan's current emissions context, commitments and priorities.

3.1.1 GHG emissions baseline

The last GHG inventory was undertaken during 2020 for the BUR2²⁷⁴, for the year 2016, and will be submitted to the UNFCCC Secretariat soon. To date, GHG inventories have been calculated for the years: 2000, 2006, 2010, 2012 and 2016. The sectoral (bottom-up) approach estimated the GHG emissions and removals from all sectors, and shows the dominance of the Energy sector, representing 76% of total national emissions. National emissions have grown 109% between 2000 and 2016, with a 69% increase in Energy sector emissions. Although the waste sector only represents 12% of total emissions in 2016, it has grown 369% since 2000.

The largest single emissions sector is now power generation, contributing 38% of total Energy sector emissions, closely followed by Transport at 37%. Buildings (residential, commercial) and agriculture make up 12% of energy emissions, with industry 8%.

Recent data from the BUR2 (unpublished) is shown in the figures and tables below.

Table 34: Jordan's GHG emissions (2016) - unpublished

Sector	2016	
	% of total emissions	Emissions (Gg CO ₂ eq)
Energy	76.0%	23649.47
IPPU	10%	3177.42
AFOLU	1.38%	428.71
Waste	12%	3807.73
Total	100%	31063.32

Table 35: BUR2 timeseries emissions data for Energy sector - unpublished

Categories/Years	2000	2006	2010	2012	2016
Total National Emissions and Removals	Gg CO ₂ eq				
	14,827.61	19,779.8	23,170.94	28,110.71	31,063.32
1 - Energy	14,016.09	18,508.44	19,260.38*	22,823.63*	23,649.47
2 - Industrial Processes and Product Use	NE**	NE**	1,776.09*	3,144.71*	3,177.42
3 - Agriculture, Forestry, and Other Land Use	NE**	NE**	180.5	237.29	428.71
4 - Waste	811.52	1,271.36	1,567.49	1,635.14	3,807.73

²⁷⁴ BUR2 data provided by Royal Scientific Society of Jordan – not yet published

Memo Items (5)					
International Bunkers	523.53	905.40	1,078.11	1,110.02	4,320.36
1.A.3.a.i - International Aviation (International Bunkers)	519.04	734.85	1,016.41	1,044.24	3,394.73
1.A.3.d.i - International water-borne navigation (International bunkers)	4.49	162.49	52.2602	56.0552	925.63
1.A.5.c - Multilateral Operations	NO	NO	NO	NO	NO

* These categories have been recalculated ** These categories were not estimated (will be estimated as part of the third BUR)

According to the BUR2, the energy sector is still the major emitter sector with the following breakdown, shown in Table 36 (not yet formally published).

Table 36: Energy sector emissions (2016) - unpublished

Sector	2016	
	Total emissions (Gg CO ₂ eq)	% of total
ENERGY SECTOR	23054.59	100%
1A Fuel Combustion Activities	23032.67	98.0%
1A1 Energy Industries sub-sector	8956.12	38%
1A2 Manufacturing Industries and Construction sub-sector	2432.06	8%
1A3 Transport sub-sector	8609.48	37%
1A4 Other Sectors (Residential, Commercial, and Agriculture) sub-sector	2354.95	12%
1A5 Non-Specified (Fuels used by the military) sub-sector	680.06	3%
1B Fugitive emissions (Oil and Natural Gas)	21.92	2%

The BUR2²⁷⁵ and National Communications²⁷⁶ include baseline and mitigation scenarios which could be used as a basis for modelling. However:

- The Second BUR has been recently developed but is not yet published (as of February 2021). This includes the national GHG inventory for the year 2016 and an update to the measures included in the BUR1.
- The development of the Fourth National Communication Report (NC4) is due to start in the first quarter of 2021, which will include the national GHG inventory for the year 2017. In addition, the baseline scenario and mitigation scenario will be updated for the period (2016-2066).
- The most recent published emission projections for Jordan are still those from the BUR1 (2017), shown in Table 37. At present, this serves as an indicator, but there is likely to be many changes when the projections are updated as part of the NC4, during 2021-22, since the new energy strategy has introduced many changes.
- Similarly, the BUR1 projections have changed significantly from their predecessor (NC3), with the NC3 projections (the basis of the NDC) showing both a considerably higher baseline and mitigation scenario.

Mitigation projections and GHG data for the LTS should be aligned to the latest updates (which will likely be those carried out for the NC4, to be started soon).

Table 37: BUR1 emissions projections (2017)

Year	Baseline Scenario	Mitigation Scenario	Avoided	Cumulative Reduction
	MtCO₂ Equivalent			
2020	34.33	31.65	2.68	4.95
2025	31.45	27.44	4.01	7.85
2030	38.18	33.64	4.53	9.46
2035	40.99	38.07	2.92	5.96
2040	45.56	40.73	4.83	9.32

Table 38: NC3 emissions projections (2014)

Year	Baseline Scenario	Mitigation Scenario	Avoided	Reduction %
	MtCO₂ Equivalent			
2020	38.15	34.61	3.54	9.3
2025	39.34	34.51	4.84	12.3
2030	51.03	46.01	5.02	9.8
2035	57.08	52.11	4.98	8.7
2040	61.57	56.39	5.16	8.4

3.1.2 Jordan's existing mitigation commitment

Jordan's INDC²⁷⁷ committed the country to reducing total GHG emissions by 1.5% by 2030 compared to business as usual scenario levels (unconditional target) and by an additional 12.5% by 2030 (conditional target). The two targets were stated to be achieved based on implementing at least 70+ projects (43 sectoral projects resulted from the mitigation scenario assessment articulated in the 2014 Third National Communication Report (NC3) to UNFCCC²⁷⁸ and another around 27+ sectoral priority projects proposed concurrently or newly planned and not listed in the NC3 Report.

The NDC is the only national document that specifies a mitigation target for a specific timeline. However, no new analysis was carried out in the development of the NDC, which utilised analysis from the NC3. Given that emissions were projected in the NC3 to grow from 31456.13 Gg CO₂e in 2015 to 51027.74 Gg CO₂e in 2030, achieving a 14% reduction on the BAU in 2030 would still result in a net growth in emissions of 40%. Updates to the mitigation projections and baselines are expected to take place under the 4th National Communication, to be developed in 2021, but will not be in time to inform the updated NDC. The Second Biennial Update Report does however include an updated baseline GHG inventory, although is not yet published²⁷⁹.

Other mitigation targets that exist in Jordan include:

- Local SE-CAP targets: Greater Irbid has committed to reduce emissions by at least 40 % below 2015 levels by 2030 (conditional). Aqaba and Karak have also adopted this 40% target, but as a secondary scenario.
- Amman has committed to net zero emissions by 2050 in the 'Amman Climate Plan'
- The National Energy Strategy 2020 – 2030 aims to reduce CO₂ emissions by 10% by 2030.

²⁷⁷ Hashemite Kingdom of Jordan Intended Nationally Determined Contribution (INDC) (2016), Available from: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Jordan%20First/Jordan%20INDCs%20Final.pdf>

²⁷⁸ Hashemite Kingdom of Jordan (2014), Jordan's Third National Communication on Climate Change <https://unfccc.int/sites/default/files/resource/jdrnc3.pdf>

²⁷⁹ Royal Scientific Society of Jordan, personal commentary

3.1.3 Pathways to achieve NDC vision

There is no specific national mitigation plan so far in Jordan. Nevertheless, Jordan has identified a number of mitigation measures, specified through sectoral initiatives (e.g., renewables targets for the energy sector – see Section 3.1.3.3) to achieve the national development priorities, such as the measures specified in the NC3. Jordan has also produced a set of prioritised NDC actions²⁸⁰ and considered priority technologies for mitigation, which are detailed below. These are, in aggregate, expected to help deliver the targets set in the NDC.

3.1.3.1 Prioritised NDC actions

An exercise lead by the Ministry of Environment and carried out by the NDC partnership identified priority areas/actions²⁸⁰ from Jordan's NDC. The following mitigation areas were prioritised during this exercise:

Energy

- Installed capacity of RE targets
- RE as share of Energy mix targets
- Energy access targets
- Solar rooftop target
- Commitments to address existing fossil fuel targets e.g. coal phase out targets, no new coal beyond project pipeline commitments, air quality targets
- Energy storage targets
- Targets for smart meter deployment

Transport

- Amman BRT and Amman-Zarqa BRT
- Improve and promote public transportation system (using Intelligent transport systems)

Industry

- Low-carbon technology R&D
- Incentives for Low-carbon industries
- Promote EE and RE

Waste

- Improve Solid Waste management in landfills and promote for waste to energy projects
- Improve the operations and the energy efficiency of wastewater treatment plants and networks

3.1.3.2 Priority technologies

A 'Technology Needs Assessment'²⁸¹ by the Ministry of Environment details priority areas in regard to technological needs, identifying energy and transport as the priority areas for mitigation.

The final results for the energy sector's top three priority mitigation technologies were:

1. Solar thermal
2. PV for electrification
3. PV for water pumping

The three top-ranked priority mitigation technologies for the transportation sector were:

1. Bus Rapid Transit
2. Improving pedestrian infrastructure
3. Ticketing systems to improve the quality and the attractiveness of public transport services

²⁸⁰ Ministry of Environment (2020), "NDC Prioritization List". Provided to the NDC Partnership

²⁸¹ Ministry of Environment (2016), "Technology Needs Assessment": <https://tech-action.unepdtu.org/wp-content/uploads/sites/2/2017/06/jordan-tna-report-march-2016.pdf>

3.1.3.3 Transition to renewables

Tackling energy-related emissions will be critical to Jordan’s mitigation pathway, given that 76% of total national emissions in 2016 were from Energy²⁸². One of the most recent assessments relevant to Jordan’s energy sector mitigation pathways is the 2021 ‘Renewables Readiness Assessment’²⁸³. This highlights existing challenges and key opportunities for Jordan’s renewable transition, as the country aims for greater energy security, supply diversity and sustainability under the 2020 National Energy Strategy²⁸⁴. This policy calls for a sustainable future energy supply, diversification of the national energy mix, increased dependency on the share of domestic energy resources, enhanced energy security, and reduced energy dependence and cost of electricity supply to 2030. The strategy targets a 31% share for renewables in total power generation capacity and 14% of the total energy mix by 2030.

Potential challenges/bottlenecks include:

- Adapting the policy and regulatory environment for future renewables growth
- Catalysing investments to meet renewables ambition (international investment has been significant (75%), but several factors limit domestic investment)
- Integration of renewables into the power system (i.e., lack of transmission and distribution infrastructure capacity)
- Slow growth in electricity demand (a critical limit on the long-term stability of the sector).

Further challenges from the perspective of Jordan’s LTS include a BAU emissions reduction target of just 10% by 2030, and ongoing commitment to energy sources such as oil shale.

3.2 Jordan’s long-term mitigation pathway

3.2.1 Key issues to address in mitigation actions

1. Energy storage and grid stability

Jordan currently suffers from issues surrounding surplus electricity, which may make the uptake of further renewable sources of energy seem unnecessary and unattractive to policymakers. As a result, if Jordan is to meet its renewable energy targets (which are crucial to its decarbonisation journey, with the energy sector accounting for 76% of national emissions²⁸⁵), action needs to be taken to enhance to storage capacity and stability of the grid. This need will be further compounded by market-driven technological shifts towards increased electrification of other end-uses, including transportation, resulting in growing demand for electricity. One action that is being explored to address this is hydro-pumped storage, which is included in Jordan’s prioritised list of NDC Actions²⁸⁶. However, this action is likely to result in maladaptation – the dam is planned to be constructed in an area already receiving low rainfall and is likely to result in significant depletion of already scarce water resources. Furthermore, Jordan’s existing water scarcity is likely to be exacerbated in the future by climate change, potentially enhancing the negative effects of this energy storage solution in the future. It is recommended that non-water-based energy storage actions are explored instead and alongside a long-term shift to greater use of renewables, actions to support grid stability and energy storage are also prioritised.

2. Energy use in the water sector

²⁸² Unpublished data from Jordan’s Second Biennial Update Report to the UNFCCC, not yet submitted

²⁸³ IRENA (2021), “Renewables Readiness Assessment”: http://cms.irena.org/-/media/Files/IRENA/Agency/Publication/2021/Feb/IRENA_RRA_Jordan_2021.ashx

²⁸⁴ Ministry of Energy and Mineral Resources (2020), Energy Sector Strategy <https://www.memr.gov.jo/AR/Pages/%D8%A7%D8%B3%D8%AA%D8%B1%D8%A7%D8%AA%D9%8A%D8%AC%D9%8A%D8%A9%D9%82%D8%B7%D8%A7%D8%B9%D8%A7%D9%84%D8%B7%D8%A7%D9%82%D8%A9?View=1059>

²⁸⁵ Unpublished data from Jordan’s Second Biennial Update Report to the UNFCCC, not yet submitted

²⁸⁶ Ministry of Environment (2020), “NDC Prioritization List”. Provided to the NDC Partnership

The water sector is Jordan's largest consumer of electricity, accounting for about 15% of the country's energy production²⁸⁷. Contributing to this high energy consumption is the geographical distance between water sources and consumers, as well as the challenging hydrogeology and topography of the country²⁸⁸. High energy consumption, combined with rapidly increasing energy costs, is negatively impacting the economic sustainability of water supply companies, with current water charges failing to completely cover supply costs⁵¹. These challenges pose a significant threat to the security of water supply to the population. The National Water Strategy (2016-2025) begins to address this, with plans to reduce the energy consumption of the water sector by 15% by 2025²⁸⁹.

3.2.2 Considerations for modelling potential pathways

In order to support decarbonisation of the Jordanian economy in line with the long-term decarbonisation vision, modelling of decarbonisation pathways will be required. To understand what potential pathways for Jordan may include, likely mitigation measures in each sector will be considered. Apart from that, it is also important to understand when emissions are expected to peak and by when they can be phased out under each pathway. The earlier the emissions peak and the sooner they are phased out, the more ambitious mitigation actions will need to be implemented.

Given that different mitigation measures and their level of ambition will lead to different outcomes, the analysis is grouped around three types of pathways. These suggested pathways are as follows.

Table 39. Possible pathways for modelling decarbonisation of the Jordanian economy

Pathway	Description	Possible dates for key milestones
1. Baseline pathway	Includes all current plans and policies adopted in Jordan without any further increase in the level of decarbonisation ambition	Absolute emissions continue growing beyond 2040
2. Moderately ambitious decarbonisation pathway	Suggests an increased level of mitigation actions, particularly in the main emitting sub-sectors	Reaching emissions peak before 2040 and fully decarbonising by approximately 2070
3. Ambitious decarbonisation pathway	Includes very ambitious measures in all sectors	Reaching emissions peak before 2030 and fully decarbonising by 2050

Source: authors

While the years chosen for emissions peak and full decarbonisation are indicative only, the logic embodied by these scenarios is widely used to model and understand implications of each different mitigation ambition levels. For example, the assessment undertaken by IRENA (2020)²⁹⁰ which considered different scenarios for the global energy sector to decarbonise in line with the 1.5°C scenario by 2050, developed scenarios similar to those listed in the table above. These scenarios include the "Planned Energy Scenario" which relies on the currently announced decarbonisation policies and aligns with suggested pathway 1, and Transforming Energy Scenario which relies on ambitious yet reasonable decarbonisation and aligns with suggested pathway 2. Given that this report offers regional projection for the Middle East and North Africa region (MENA) it will be referenced further in the undertaken analysis.

²⁸⁷ UNFCCC (no date), "NAMA: Improvement of Energy Efficiency in the Jordanian Water Sector (IEE)", Available at: <https://www4.unfccc.int/sites/PublicNAMA/layouts/mobile/dispsform.aspx?List=162696e7-ba65-46a5-8070-883d26e0df6b&View=fff371d2-781e-44c5-bf33-bef0c4e10dc7&ID=18>

²⁸⁸ GIZ (no date), "Increasing energy efficiency in the water sector", Available at: <https://www.giz.de/en/worldwide/69100.html#:~:text=In%20fact%2C%20the%20water%20sector,energy%20consumption%20in%20the%20country.&text=The%20National%20Water%20Strategy%202016,15%20per%20cent%20by%202025.>

²⁸⁹ Ministry of Water and Irrigation (2016), "National Water Strategy 2016-2025", <http://extwprlegs1.fao.org/docs/pdf/jor156264E.pdf>

²⁹⁰ IRENA (2020) 'Energy transformation 2050'. Available at: <https://www.irena.org/publications/2020/Apr/Global-Renewables-Outlook-2020>

Each of these scenarios will require implementation of mitigation measures. Please note that mitigation measures and any quantitative estimates grouped under these pathways in further analysis are indicative only and were selected to provide an idea of what these scenarios can entail. Further data gathering, analysis and modelling will be required for more precise pathway formulation. At this stage however, the analysis presented below suggests what types of measures could be considered for each of these scenarios.

3.2.3 Sectoral mitigation measures for considered pathways

In line with the difference demonstrated by emission performance of different sectors (as shown in section 3.1 - Jordan's emissions) decarbonisation of these sectors will have varying levels of impact on reducing national emissions. The energy sector, responsible for over three quarters of the Jordanian national emissions, should become a priority for the decarbonisation effort, while other sectors should also play an important part.

The decarbonisation measures recommended for inclusion in each pathway modelling for each sector are discussed below.

3.2.3.1 Energy

The energy category represents the largest category of emissions in Jordan. Within this sector, 38% of emissions are produced by power generation. The second most important sub-sector is transport with 37% of emissions, followed by manufacturing with 8%. Other sectors, including residential, commercial and agriculture, contribute the rest of emissions.

The IRENA (2020) assessment of decarbonisation pathways suggests that, under the “Planned Energy Scenario” which is broadly aligned with the Baseline pathway in our assessment, energy emission in the MENA countries will continue growing until 2050, yet their growth will be insignificant after 2040. For Jordan, the baseline pathway would suggest implementing all measures which are currently planned as part of its NDC implementation and relevant sectoral policies. More ambitious actions in each subsector are discussed below.

Transport: Based on the IRENA (2020) projections, under the “Planned Energy Scenario”, energy consumption in the transport sector in the MENA region will increase by 44% by 2050 with almost all of this energy coming from non-renewable sources. However, under the more ambitious yet realistic decarbonisation scenario, aligned with the moderately ambitious pathway in our assessment, the transport emissions can half. Moreover, 12% of the energy consumption remaining in 2050 would be coming from renewable sources.

To support decarbonisation of the transport sector, the key policy options requiring modelling will be associated with the **increase in the future transport use and the uptake of electric vehicles (EVs)**. In the prioritised NDC actions, Jordan included measures such as BRT implementation in Amman, Battery Electric Vehicle Fleets for public service vehicles, Solar Powered Electric Bus Fleet and other measures which will result in emission reductions. The reductions achieved by these measures however are expected to be moderate. Therefore, for more ambitious pathways additional measures will be required.

The pathways with high ambition will require measures to support higher deployment of EVs, particularly among private vehicles. Apart from decarbonising transport, this measure will also support implementation of renewable energy through offering energy storage space in EV batteries enabling more flexible power load management. To support the uptake of EVs, **the construction of charging infrastructure** will be crucial. It can be combined with other measures such as EV subsidies, taxes on conventional vehicles or road access priority rights. The level of the mitigation effort and expected EV uptake can serve as a basis for developing the Moderately ambitious and Ambitious pathways.

For example, a study prepared for the European Commission analysed a range of scenarios for EV uptake, ranging between 20% and 84% of all new cars sold in the EU by 2030. Jordan can apply a similar approach, including measures needed to reach certain levels of EV deployment and adjusting its expected EV uptake levels to its national potential.

Another important element of the transport pathways development is estimating **the level of public transport use**. The approach to defining the targeted public transport use rates for this indicator can be similar to those of the EV uptake where the measures and associated investment in the public transport sector, its optimisation and electrification results in a targeted level of public transport use as opposed to the use of private vehicles.

However, while the electrification of the transport sector is highly important, its ultimate decarbonisation success largely depends on the power grid mix in Jordan and will require more low carbon power generation.

Power generation: Due to increased access to electricity and accelerating electrification, the demand for power in Jordan is growing. Based on the IRENA (2020) scenarios, the power generation in the MENA countries is likely to increase by 130% under the Planned Energy Scenario and by 50% under the Transforming Energy Scenario. Given that Jordan is currently importing 93% of its energy, but is planning to reduce its reliance on external source, the power generation emissions in Jordan are like to increase at an even faster rate.

To reduce emissions from power generation, an increase in generation of lower carbon electricity is crucial. The new national strategy outlines the following expected outcomes which can underpin the baseline pathway. These targets however only cover 2030 and will need to be extended to 2050.

- Renewable energy to contribute in 31% of electricity generation by the year 2030.
- Increasing the storage capacity of Petroleum derivatives by 20% in the year 2030.
- Reducing the usage of natural gas (NG) from 85% in 2019 to 53% by 2030.
- Increasing the use of national resources for generating electricity from 15% in 2019 to 48.5% in 2030.
- Enhancing energy efficiency in the water sector by 15% in 2025
- Improving efficient energy consumption in all sectors by 9%

In addition to these targets, Jordan has identified a number of NDC measures supporting decarbonisation of power generation, however, they only focus on solar water heating resulting in a very limited scope.

For more ambitious pathways, a **higher level of deployment of renewable energy technologies or potentially nuclear power will be required**.

- **Renewables.** Jordan has one of the highest potentials for solar power generation in the world²⁹¹ as it receives a very high level of solar radiation. Studies²⁹² have also demonstrated that Jordan has a very high potential for wind power generation in multiple locations. The uptake of renewable power generation so far was slow for a number of reasons, primarily associated with regulatory difficulties and grid capacity limitations. However, to achieve wider decarbonisation of the economy the increased deployment of renewable power will be needed. It is recognised, however, that due to the existing barriers the increase of solar power can be limited in the short term. Nevertheless, in the medium- and longer-term the levels of renewable electricity generation will need to be significantly above those indicated in the current energy strategy.
- **Nuclear.** Jordan has previously explored the potential to start nuclear power generation with up to 30% of national power coming from nuclear by 2030. The deployment of nuclear power could have a significant impact supporting decarbonisation of the Jordanian electricity mix.

At the same time, it is important to understand the dynamics of the fossil fuel consumption. Jordan possesses one of the largest oil shale reserves in the world. While the power plants which will rely on this oil are currently under construction, once completed, they are expected to meet 10-15% of Jordan's annual power demand. Their long-term utilisation, as well as further increase in Jordan's reliance on oil

²⁹¹ Baniyounes, A.M. (2017) 'Renewable Energy Potential in Jordan', *International Journal of Applied Engineering Research*, 12(19), pp.8323-8331. Available from: https://www.ripublication.com/ijaer17/ijaerv12n19_44.pdf

²⁹² Anagreh, Y. and Bataineh, A. (2011) 'Renewable Energy Potential Assessment in Jordan', *Renewable and Sustainable Energy Reviews*, 15(5), pp. 2232-2239. Available from: <https://www.sciencedirect.com/science/article/abs/pii/S1364032111000529>

shale reserves, can set back its decarbonisation effort. For ambitious pathways, the utilisation of the oil shale reserve will need to be drastically limited along with phasing out subsidies and financial support for other fossil fuels.

Industry: The decarbonisation of industry can be achieved through energy efficiency measures and electrification. The IRENA (2020) analysis suggested that under the Planned Energy Scenario industrial emissions in the MENA can double by 2050, while under the Transforming Energy Scenario they can be reduced by 10%. Currently, planned NDC actions include energy audits for industrial facilities supported by the MEMR/JREEEF. For more ambitious pathways additional measures can include:

- Support for energy efficiency in the form of subsidies or grants for energy efficient equipment
- Policies encouraging electrification of industry
- Use of biofuels where electrification is not possible

For modelling of these pathways, it will be necessary to estimate the level of energy demand in industry, achieved energy efficiency improvement, the level of electrification and the level of biofuel use.

Other: To achieve more ambitious decarbonisation targets, Jordan will also need to decarbonise its emissions from buildings, including residential and commercial sectors. The NDC actions include a number of measures targeting this type of emission reductions, such as green building codes and solar cooling as well as financially supporting Renewable Energy and Energy Efficiency Projects. These measures can underpin the baseline pathway. More ambitious pathways will largely rely on the same measures, yet a greater commitment (including enhanced financial support) will be needed.

3.2.3.2 Waste

The waste sector emits around 12% of Jordanian emissions. Currently, 48% of municipal solid waste is landfilled, 45% is openly dumped and only 7% recycled. The Jordan 2025 plan foresees reduction of the share of landfilled waste to 60% by 2025 which can constitute the baseline pathway assumption. For more ambitious pathways, implementation of technologies such as methane capture and use will need to be deployed. This in turn will help to support the decarbonisation of electricity generation if captured methane is used for power generation. The uptake of recycling will also need to continue and be happening at a higher rate.

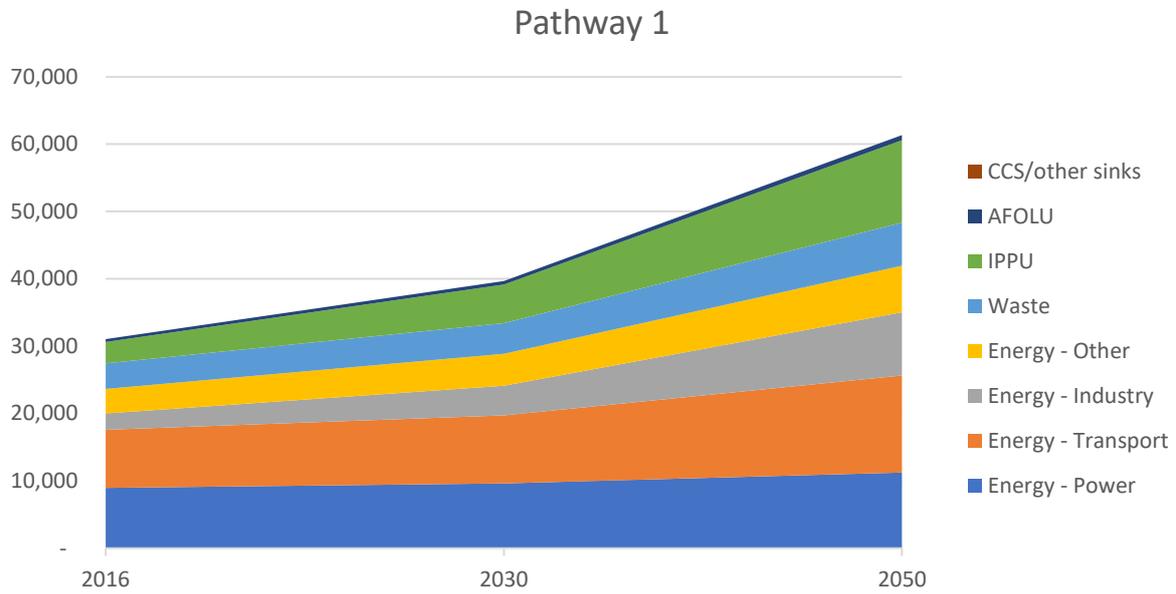
3.2.3.3 Other sectors

The IPPU emissions, which is the third major category of emissions contributing to the Jordan's national emissions, are hard to reduce due to the nature of the process emissions. While not being significant enough to constitute the focus of the climate policy in the short term, a longer-term target of net zero will eventually require Jordan to address these emissions. This can be done through negative emission technologies such as carbon capture and storage (CCS) or increasing natural carbon sinks in Jordan. The CCS technology is currently very costly, but given its importance in the global decarbonisation it is expected that its price will reduce with time allowing its wider deployment. Alternatively, natural carbon sinks can be increased through afforestation or re-forestation in the northern parts of Jordan with higher rainfall.

The agricultural emissions are considered minor and are not addressed as part of the pathways individually.

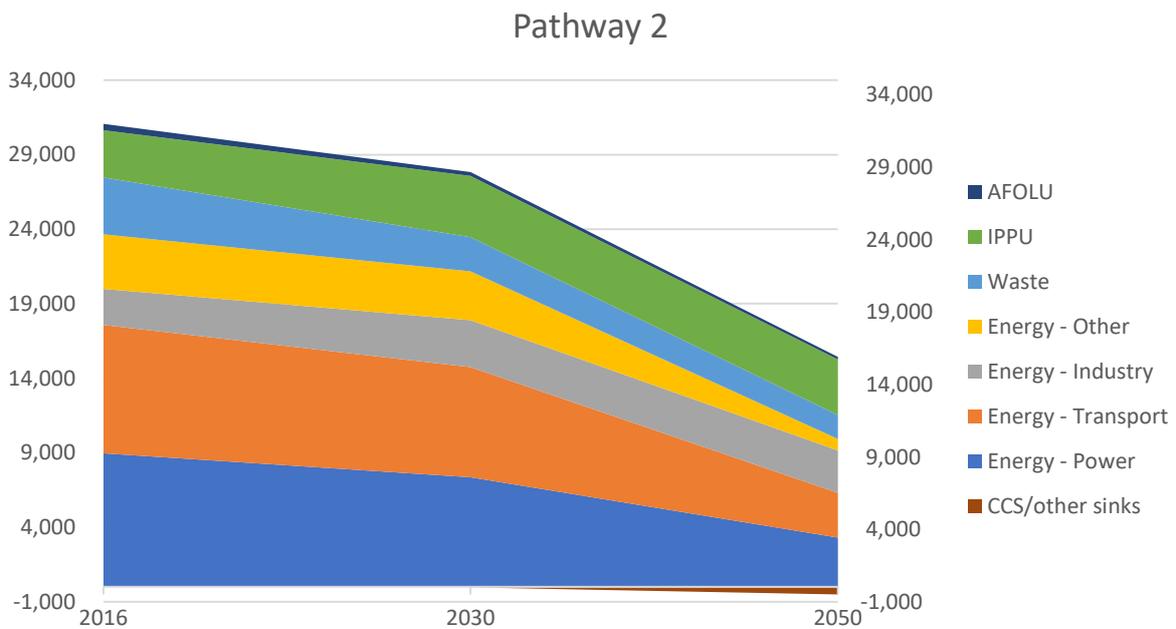
The figures below illustrate what the three pathways discussed may look like.

Figure 49: An illustration of the potential trajectory of emissions under a low ambition scenario (informed by IRENA (2020) projections for 'Planned Energy Scenario').



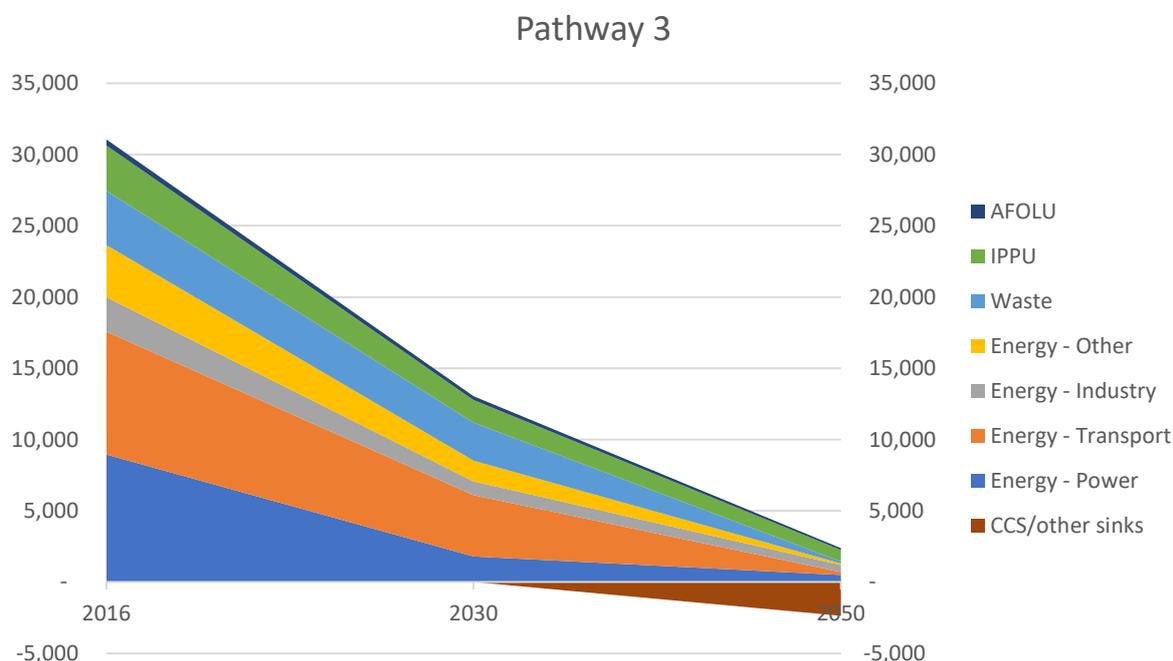
Source: Developed by Ricardo Energy and Environment

Figure 50: An illustration of the potential trajectory of emissions under a moderately ambitious scenario (informed by IRENA (2020) projections for 'Transforming Energy Scenario').



Source: Developed by Ricardo Energy and Environment

Figure 51: An illustration of the potential trajectory of emissions under a high ambition scenario (assuming full decarbonisation).



Source: Developed by Ricardo Energy and Environment

Some of these changes will be driven by market forces towards greater efficiency and technological availability. Key questions for Jordan to determine are in relation to the speed and level of decarbonisation to target – as per the three indicative pathways – and include:

- **When will emissions peak?** The sooner emissions peak, the lower the required rate of reducing emissions each year. Meeting the target will be less expensive and the transition smoother than it will be if emissions rise more and for a longer time.
- **When will net GHG emissions be phased out?** According to the Emissions Gap Report (UNEP), to have a likely chance of keeping warming to below 2°C, global net CO₂ emissions drop to zero between 2060 and 2075 on average (with net greenhouse gas emissions declining to zero between 2080 and 2090). To have a likely chance of limiting warming to below 1.5°C, global net CO₂ emissions drop to zero between 2045 and 2050 (with net greenhouse gas emissions declining to zero between 2060 and 2080). There is no expectation that all countries reach net zero emissions at the same time, but these scientific guideposts indicate the scale of transformation required.
- **How to ensure a realistic rate of reducing emissions, so that the annual rate of emissions decline and any increase in carbon removal is feasible?** The feasibility of emission reductions can depend upon the mitigation potential in key sectors, the co-benefits to be achieved through mitigation, any tradeoffs with other development and policy goals, the low-carbon energy potential, the financing capacity, technological advances, cost, and other national circumstances.

The assumptions considered for the discussed pathways are summarised below in Table 40.

Our assumptions for the uptake of renewables align with the National Energy Sector Strategy 2020-2030, which is the most recent and important energy sector document to consider in the mitigation

pathway development process. However, the assumptions for nuclear energy uptake do not align with the National Energy Sector Strategy – they are instead taken from Jordan’s First Biennial Update Report, which has since been superseded by more recent strategies. The inclusion of nuclear power here is intended to illustrate the diversification of energy sources needed to mitigate Jordan’s energy sector emissions, but this option should be carefully discussed with government and stakeholders before being considered for inclusion in LTS mitigation pathways. Similarly, the assumptions for oil shale use here do not align with the National Energy Sector Strategy, which states that oil shale accounted for 15% of electricity generation in 2020 with this contribution to the energy mix planned to persist to 2030. Here, we have assumed decreased oil shale use in the more ambitious scenarios because this share of oil shale in the energy mix is not compatible with decarbonisation goals.

It is important to note that these assumptions and pathways are intended to be illustrative rather than actual recommendations - it will be very important to carefully consider whether the assumptions in the following table are truly appropriate within the Jordanian context, and whether they are still relevant to the most recent national strategies at the time of pathway development.

Table 40: Illustrative assumptions for suggested pathways

Sector	4. Baseline pathway	5. Moderately ambitious pathway	6. Ambitious pathway
	<i>Absolute emissions continue growing beyond 2040</i>	<i>Reaching emissions peak before 2040 and fully decarbonising Jordanian economy by approximately 2070</i>	<i>Reaching emissions peak before 2030 and fully decarbonising by 2050</i>
Energy			
Transport	<ul style="list-style-type: none"> • Low levels of EV uptake <ul style="list-style-type: none"> ○ Electrification of public fleet • Support for BRT & other modes of public transport 	<ul style="list-style-type: none"> • Moderate level of EV uptake: <ul style="list-style-type: none"> ○ Moderate investment in EV charging infrastructure ○ Other policies encouraging the use of EV (access priorities, etc) ○ Electrification of public fleet • Support for BRT & other modes of public transport 	<ul style="list-style-type: none"> • High level of EV uptake: <ul style="list-style-type: none"> ○ High investment in EV charging infrastructure ○ Economic policies encouraging the use of EV (subsidies, taxes on conventional vehicles, access priorities, etc) ○ Electrification of public fleet • Support for BRT & other modes of public transport
Power generation	<ul style="list-style-type: none"> • Energy consumption increases significantly due to increase reliance on domestic energy sources • Renewables achieve 30% by 2030 and continue growing through to 2050 • Nuclear power reaches 30% by 2030 but does not grow further • The reliance on shale oil increases to 15% by 2030 • The use of natural gas reduces 	<ul style="list-style-type: none"> • Energy consumption increases significantly due to increase reliance on domestic energy sources • Renewables achieve 50% by 2050 • Nuclear power reaches 30% by 2030 but does not grow further • Shale oil reliance decreases to 5% by 2030 • The use of natural gas reduces 	<ul style="list-style-type: none"> • Energy consumption increases significantly due to increase reliance on domestic energy sources • Renewables achieve 60% by 2050 • Nuclear power reaches 30% by 2030 but does not grow further • Shale oil is not used after 2030 • The use of natural gas reduced
Manufacturing	<ul style="list-style-type: none"> • Energy audits supported by the government produce small reduction in energy consumption 	<ul style="list-style-type: none"> • Energy audits & subsidies for energy efficient equipment supported by the government produce moderate reduction in energy consumption 	<ul style="list-style-type: none"> • Energy audits, subsidies for energy efficient equipment, support for electrification and biofuels deployment supported by the government produce moderate reduction in energy consumption & emissions
Other	<ul style="list-style-type: none"> • Energy efficiency improvements through implementation of green building codes • Lower support for RE and EE projects in buildings 	<ul style="list-style-type: none"> • Energy efficiency improvements through implementation of green building codes • Moderate support for RE and EE projects in buildings 	<ul style="list-style-type: none"> • Higher energy efficiency improvements through implementation of more stringent green building codes • High support for RE and EE projects in buildings
Waste			

Waste	<ul style="list-style-type: none"> Reduction of landfilled waste to 60% by 2030 and gradual reduction after that 	<ul style="list-style-type: none"> Reduction of landfilled waste to 45% by 2030 and gradual reduction after that Small scale implementation of methane capture and use 	<ul style="list-style-type: none"> Reduction of landfilled waste to 30% by 2030 and gradual reduction after that Large scale implementation of methane capture and use
Other			
Other: CCS & natural sinks	<ul style="list-style-type: none"> No use of CCS or increasing carbon sinks 	<ul style="list-style-type: none"> Increasing carbon sinks 	<ul style="list-style-type: none"> Increasing carbon sinks Deployment of CCS after 2030

Source: authors

3.3 Summary of findings

Jordan's planned mitigation actions will influence its future emissions trajectory and the types of technologies and transformations it will need to simulate. Some key aspects of Jordan's future mitigation pathway include:

- NDC mitigation target of 14% (1.5% unconditional, 12.5% conditional) reduction by 2030 compared to business as usual, which will still result in a net growth in emissions.
- Emissions are dominated by the energy sector (76%) and so the mitigation pathway will likely rely on high levels of renewable energy deployment (especially solar), energy efficiency, transport mode shift and electrification, and improved waste management (SWM and WWT).
- Solar thermal and solar PV are likely to be key technologies in the transformation of Jordan's energy system.
- Transition to renewables: The official target is to have a 31% share for renewables in total power generation capacity and 14% of the total energy mix by 2030. However, the new energy strategy retains a 15% share of generation from shale oil.

Jordan's mitigation scenarios to date are set to achieve only a small reduction on the BAU scenario and are projecting an increase in net emissions over the period. This is not compatible with either the scientific consensus on the need to deliver net reductions in emissions to avoid dangerous climate change, even in a 'peak-plateau-decline' type scenario, and falls far short of the reductions required if Jordan was to target a 'net zero' 2050 goal²⁹³.

The example pathways provided in this section are intended to be indicative only, to provide an insight and a starting point for Jordan to consider its potential decarbonisation pathway.

Priorities or 'pillars' of decarbonisation that Jordan can consider adopting for the LTS, based on existing priorities and the needs of the pathways outlined above, could be summarised as:

- 1. Increasing decarbonisation and diversification of electricity supply**
 - Increasing small-scale renewable energy deployment and providing the conditions for growth
 - Encouraging large-scale renewables
 - Improving energy storage and grid stability etc
- 2. Supporting enhanced energy efficiency across all sectors**
 - Including energy for water, building retrofits and green building codes, industrial energy efficiency, agricultural energy efficiency
- 3. Incentivise lower carbon technology uptake (heating, cooling, transportation)**
 - Solar hot water, rooftop solar, cooling etc
 - Strengthen the development, implementation and enforcement of existing regulation
 - Promote innovative, efficient and lower carbon technologies and infrastructure
- 4. Promote electrification in all sectors**
 - Ensure the conditions are right through enabling infrastructure, for adoption of increasing electrification of end uses of energy e.g. transport
 - Enhance grid stability and energy storage capacity
- 5. Develop accessible, diverse, energy efficient and low and zero carbon transportation modes and technologies**
 - Promotion of cleaner transport infrastructure including mass transit and promotion of non-motorised transport
 - Provide the supporting conditions (infrastructure etc) for uptake of cleaner transport options

²⁹³ Unclear whether Jordan will do this – there is (anecdotally) some lobbying in the process to update the Climate Change Policy to adopt such a goal, but it has not yet been agreed upon.

6. Promoting resource efficiency through integrated and circular waste and water resource management systems

- E.g. waste reduction, water efficiency, re-use of treated wastewater, intensive agriculture etc
- Reducing waste
- Improving wastewater treatment and recovery
- Adequate wastewater collection and treatment facilities for cities, small towns and major industries and mines

7. Improve forest and rangeland management to increase the capacity to store GHG

- Ensure protection of forests and expansion (balancing any exacerbation of water stress)

8. Promote climate conscious land use and urban development plans

- Ensure that increasing urbanisation is undertaken sensitive to energy efficiency, integrated energy technologies, density, integrated transit etc.

4 Jordan's modelling context

This section outlines Jordan's previous modelling experience, and modelling needs and constraints. This has been informed by a mixture of desk-based review, consultations with stakeholders carried out by the Royal Scientific Society (RSS) project team, and via stakeholder questionnaire. Based on consideration of these different areas, a number of recommendations are then made.

4.1 Modelling tools and methods in Jordan

Jordan has undertaken a number of modelling tasks, both economy-wide and at sector level. Information on these is summarised in this section.

4.1.1 Modelling undertaken for international climate reporting

For international reporting needs, Jordan has used the models ENPEP-BALANCE and LEAP.

ENPEP-BALANCE: The ENPEP-BALANCE model is a nonlinear equilibrium model that matches the demand for energy with available resources and technologies. The functionality of the ENPEP model can be used for energy policy evaluation, including assessments on pricing, efficiency, renewable potential and overall energy sector strategy. Its market-based simulation approach allows the model to determine the response of various segments of the energy system to changes in energy prices and demand levels.

The model relies on a decentralized decision-making process in the energy sector and can be calibrated to the different preferences of energy users and suppliers. Basic input parameters include information on the energy system structure, base-year energy statistics including production, and consumption levels and prices, projected energy demand growth, and any technical and policy constraints²⁹⁴.

Due to familiarity with the ENPEP-BALANCE model due to use over a number of years, MEMR continued to use this although anecdotally reported that its relatively inflexible data requirements was increasingly restrictive. They felt it was "best" for energy balance projections but for undertaking economy wide modelling, it had limitations²⁹⁵.

LEAP: The LEAP model is a highly flexible tool in relation to the data requirements and has excellent flexibility in relation to modelling different mitigation actions or collections of different mitigation actions – this made it a simple to use tool for Jordan's BUR1 in 2017. LEAP was used for the BUR1 as it was requested by GEF as part of the support package.

When Jordan undertook this work, as the tool was new, the Stockholm Environment Institute (SEI) provided training to experts from ministries and to the Royal Scientific Society (RSS), the primary users of the model. In undertaking the BUR1, RSS created projections to 2066 but found that the data limitations meant that "the results did not seem realistic" and this led to doubts about its utility in Jordan over longer timeframes²⁹⁶. The lack of reliable macroeconomic data was felt to hinder its use for long-term projections. As such, the RSS team were recommended by SEI to work on improving data to ensure higher quality modelling outputs. Particular areas of concern were related to projections were based on GDP growth rates of 2-3%.

The RSS team showcased the LEAP model to the National Electric Power Company (NEPCO) to promote its use for long term energy planning; however, NEPCO felt that it was not directly useful for their operations but was effective as an engagement tool. More generally, the tool was found to be useful as a communications tool on future energy projections and for BUR1 outputs, despite the fears over the validity of the long-term projections, and feedback was generally positive²⁹⁷.

²⁹⁴ <https://cleanenergysolutions.org/fr/resources/energy-power-evaluation-program>

²⁹⁵ Feedback provided via stakeholder engagements, held by RSS

²⁹⁶ Feedback provided directly from RSS modelling team

²⁹⁷ Feedback provided directly from RSS modelling team

4.1.2 Sectoral modelling

At sector level, a range of models have been utilised.

The Integrated MARKAL-EFOM System (TIMES)²⁹⁸: In order to perform in-depth energy and environmental analysis for the 2030 National Energy Strategy (2020), MEMR used a version of TIMES in conjunction with various other simulation tools (listed below). Most of these models were already being utilised for ongoing Energy work in the country, and the outcomes were fed into TIMES. Feedback from stakeholders gathered during consultations was that this was a highly effective model for overall energy projections for the country, but there was a preference not to use TIMES going forwards unless it was finally supported (i.e. international support) due to the high cost of licences.

Models used to support TIMES, most recently for the National Energy Strategy:

- Wien Automatic System Planning Package (WASP) tool
- Efficiency for Energy Systems (EFESYS)
- Process Simulation (ProSIM)
- Transient System Simulation (TRNSYS) Tool
- TRNSYS for thermal simulation and modelling
- RETscreen for energy audits, energy efficiency, cogeneration projects, and Monitoring and verification
- HAP Carrier for HVAC systems
- DIALux for lighting

Jordan National Transport Strategy model²⁹⁹: This is a model referenced in the Long-Term National Transport Strategy. The strategy notes that the transport model is “a tool that is aimed at representing current conditions of the transport system for both, within Jordan (Domestic flows) and between Jordan and other countries (regional level). More importantly, the transport model allows forecasting future conditions without any strategy or measures (baseline scenario) and with the implementation of different strategies and measures in order to evaluate their respective impacts.”

This “integrated multi-modal transport model” appears to be a simulation tool, developed for the assessment of the traffic conditions and to identify the impacts of strategies and measures. The transport model is responsive to various kinds of transport planning and transport demand management measures, i.e. measures of infrastructure development, development of transport services, transport demand measures, financial measures like fuel costs, taxes, tolls, public transport fares. The strategy notes that “environmental indicators “are a direct output of model’s link statistics”.

Table 41: Summary of Jordan's model use to date

Model Type	Model	Description	Used for	Led by	Stakeholder feedback
General Equilibrium Model	Energy and Power Evaluation Program (ENPEP-BALANCE) https://ceesa.es.anl.gov/projects/Enpepwin.html	Matches the demand for energy with available resources and technologies	NC1 NC2 NC3 NDC	Ministry of Energy & Mineral Resources (MEMR)	<ul style="list-style-type: none"> ✓ MEMR familiarity ✓ Long history of use ✓ Free ✗ Only energy ✗ Less flexible data requirements ✗ No experience outside MEMR

²⁹⁸ https://ledsgp.org/resource/the-integrated-markal-efom-system-model/?loclang=en_qb

²⁹⁹ Ministry of Transport, Long Term National Transport Strategy (2017), https://www.mot.gov.jo/EBV4.0/Root_Storage/EN/EB_Info_Page/long-term_national_transport_strategy_project.pdf

Accounting	Stockholm Environment Institute's Low Emissions Analysis Platform (LEAP) https://leap.sei.org/	Integrated, scenario-based modelling tool that can be used to track energy consumption, production and resource extraction in all sectors of an economy	BUR1	Royal Scientific Society of Jordan (RSS)	<ul style="list-style-type: none"> ✓ Using for BUR2 update & likely NC4 ✓ MoE familiarity ✓ Trained team (RSS) ✓ Engagement tool ✓ Free ✗ Only energy ✗ NEPCO feedback - not positive for their operations ✗ Experienced data limitations & lost appeal
Optimisation	A version of the TIMES model: Integrated MARKAL-EFOM System (TIMES) https://iea-etsap.org/index.php/etsap-tools/model-generators/times	Combines two different, and complementary, approaches to modelling energy: a technical engineering approach and an economic approach	National Energy Strategy	Ministry of Energy & Mineral Resources (MEMR)	<ul style="list-style-type: none"> ✓ MEMR familiarity ✓ Aligns to latest Energy Strategy ✗ Less flexible data requirements ✗ Costly / requires a licence ✗ Time consuming
Simulation	Jordan National Transport Strategy model	"Integrated, multi-modal transport model"	Long Term National Transport Strategy	Ministry of Transport	No further details
Bottom-up	Climate Action for Urban Sustainability (CURB) https://www.worldbank.org/en/topic/urbandevelopment/brief/the-curb-tool-climate-action-for-urban-sustainability	Interactive tool that is designed specifically to help cities take action on climate by allowing them to map out different action plans and evaluate their cost, feasibility, and impact.	Amman Climate Plan	Greater Amman Municipality	<ul style="list-style-type: none"> ✗ Undertaken by a team from the World Bank ✗ Aimed at cities only

Below models were fed into the Integrated MARKAL-EFOM System (TIMES)

Model Type	Model	Description	Used for	Led by
Optimisation	Wien Automatic System Planning Package (WASP) tool https://www.energyplan.eu/othertools/national/wasp/	The purpose of the tool is to find the optimal expansion plan for a power generating system of a long period of time	National Energy Strategy <i>Used for electricity demand projections</i>	Ministry of Energy & Mineral Resources (MEMR)
Optimisation	Efficiency for Energy Systems (EFESYS) http://www.efesys.com/	Tool to support planning decisions for non interconnected systems. The system analyzes multiple scenarios in order to identify the optimal combination of units	National Energy Strategy <i>Used for renewable energy and energy</i>	Ministry of Energy & Mineral Resources (MEMR)

Simulation	Process Simulation (ProSIM) https://www.prosim.net/en/	ensuring cost minimization and maximization of RES penetration Has a focus on renewables, microgrids, smart grids and energy efficiencies Projections for generated electricity using combined cycle, and takes into consideration the status of the electricity system	<i>efficiency projections</i> National Energy Strategy <i>Used for projections for generated electricity</i>	Ministry of Energy & Mineral Resources (MEMR)
Simulation	Transient System Simulation (TRNSYS) http://www.trnsys.com/index.html	Flexible graphically based software environment used to simulate the behaviour of transient systems.	<i>Used for thermal simulation and modelling</i>	National Energy Centre
Bottom-up	RETscreen https://www.nrcan.gc.ca/maps-tools-publications/tools/data-analysis-software-modelling/retscreen/7465	A software package developed by the Government of Canada Clean Energy Management Software system for energy efficiency, renewable energy and cogeneration project feasibility analysis as well as ongoing energy performance analysis	<i>Used for energy audits and M&V</i>	National Energy Centre
Engineering design simulation and optimisation tool – not relevant to LTS modelling	Hourly Analysis Program (HAP) Carrier https://www.carrier.com/commercial/en/us/software/hvac-system-design/hourly-analysis-program/	Designed for consulting engineers, design/build contractors, HVAC contractors, facility engineers and other professionals involved in the design and analysis of commercial building HVAC systems. The program is a powerful tool for designing systems and sizing system components as well as modelling annual energy performance and energy costs.	<i>Used for HVAC systems</i>	National Energy Centre
Engineering design simulation and optimisation tool – not relevant to LTS modelling	DIALux https://www.dialux.com/en-GB/dialux	Software for designing and planning lighting systems	<i>Used for lighting</i>	National Energy Centre

4.1.3 Summary

To date, most modelling work in Jordan has been undertaken by the Ministry of Energy & Mineral Resources (MEMR) or through third parties, such as the Royal Scientific Society (RSS). The Ministry of Environment has not undertaken any specific mitigation modelling in-house and has limited experience and capability, so modelling work for the LTS would likely be led from MEMR or continued to be undertaken by third parties such as RSS.

RSS are and have been the lead developers and technical specialists for the NCs and BURs to date and recent modelling has been undertaken with LEAP. The NC4 work is likely to commence in Jan 2021 which will entail updated mitigation modelling, likely also using LEAP. These are likely be considerations for the approach to the LTS modelling.

4.2 Jordan's modelling needs and constraints

In support of this task, the project team also conducted a survey of key stakeholders involved in previous modelling, to understand key gaps, needs, challenges, and objectives for Jordan. The questionnaire in Appendix 1 has been drafted to capture the key requirements of the LTS model from key stakeholders in Jordan.

Key findings were:

Modelling approach:

- All respondents agreed that a hybrid approach to modelling is most appropriate (investigating both the development and interaction of specific technologies as a result of certain mitigation measures and the broader economic implications and impacts).
- All respondents also agreed that the main outputs they require from the modelling exercise are a) optimisation pathways and b) costing of mitigation options.
- All respondents agreed that the pros and cons of using a combination of modelling tools should be considered in the review.

Modelling scope:

- Respondents agreed that modelling tools should cover a timeframe up to 2050, should model time intervals of 5 years, and should model all sectors (perhaps with greater focus on those with a larger share of GHG emissions).

Modelling type:

- There was a clear desire to link the model used with other existing models, but respondents did not provide any further detail on this question.
- Two respondents also provided additional information they deemed useful to the exercise.
 - One provided information on the energy software programs used at NERC/RSS (TRYNSYS for thermal simulation and modelling; RETscreen for energy audits and MRV; HAP Carrier for HVAC; DIALux for lighting) – this has been integrated into the tables above.
 - The other noted that: “the civil aviation sector is subject to national and international obligations, so it needs to strengthen this consensus and at the same time integrate it with the national strategy” – this shows that there is a need for the LTS to engage with and include all sectors their ambitions.
- Multiple respondents agreed that the LTS should align with the National Energy Strategy and agree that LTS modelling should align with or support other modelling activities in Jordan.

Practical issues:

- Respondents generally agreed on data quality being high for energy industry, medium for transport (with better data for Amman), and high for civil aviation. However, there was no mention of data availability or quality for the waste sector, AFOLU, etc by any respondent.
- Respondents noted that there is no budget available for licensing, unless the funds come from the budget of a specific (funded) project.
- Respondents agreed that consultants will take on a key role in leading the modelling exercises, but only a few agreed that the Government will also take a leading role. It was also generally agreed that there are sufficient experts in Government and consultancies, but with one respondent believing more experts are needed.
- Almost all respondents believed a timeframe of 6 months is most appropriate for the modelling exercise.

4.3 Summary

Jordan has produced a number of reports that may serve as a basis for mitigation planning, with the most recent published emission projections for Jordan being from the BUR1 (2017). At present, this serves as an indicator, but there is likely to be many changes when the projections are updated as part of the NC4 (during 2021-22) since the new energy strategy has introduced many changes. The new NC4 mitigation analysis (expected to go beyond 2050, and likely undertaken using LEAP) will therefore supersede previous analyses and be the basis for national future emissions reporting and planning.

As discussed in section 2.2, in-country experience (as a component of national circumstances) will be a key consideration for model selection. Furthermore, the results of our modelling tools survey suggest that with pre-existing knowledge and experience of suitable tools (LEAP, TIMES, and ENPEP-BALANCE), this combined with a lack of budget available to purchase new software, means that these should be part of the modelling shortlist for Jordan. LEAP is likely to be a preferred option given its more recent use for the BUR2 and likely the NC4, its communication benefits, ease of use, existence of trained staff in country, and widespread popularity globally.

Potential constraints identified from survey responses that Jordan will need to consider include data availability and/or quality (which may be low for some sectors); the need to review and address uncertainties in key data on e.g. GDP and population growth to address previous poor perceptions of model outputs; a need for more experts to aid the modelling task and building in-house capacity in the Ministry of Environment and/or the establishment of an expert group to ensure the longevity and sustainability of knowledge within the Ministry. It will also be important that the modelling undertaken for the LTS takes account of and aligns with existing models and strategies, particularly the recent National Energy Strategy, and produces optimisation pathways and costing of mitigation options to support policy making.

5 Modelling tool review

The section reviews the various models/tools that we recommend are considered for use in the formulation of Jordan's LTS, and the criteria against which they should be assessed.

5.1 Models/tools for review

Based on our prior work, assessment of Jordan's models and tools used to date, and knowledge of the models/tools used by other countries in the preparation of their LTS, we suggest the models below should be included in the review. This list includes our original proposed list of 5 popular models, which includes both models identified and used previously by Jordan – TIMES and LEAP – and additional models that have not been used but may be suitable. It also includes a 6th model, ENPEP-BALANCE, which has been used by Jordan previously, as outlined in section 4.

Original model list:

1. **Low Emissions Analysis Platform (LEAP)**³⁰⁰ – An accounting model which describes the key performance characteristics of an energy system, which allows users to explore the implications of resource, environment and social cost decisions. LEAP can be developed relatively quickly and is flexible to different levels of detail and data availability.
 - LEAP has been used in Jordan for the BUR1 and will likely be used for the NC4.
2. **Energy Forecasting Framework and Emissions Consensus Tool (EFFECT)** is an Excel-based model used to forecast GHG emissions from a range of development scenarios at the national level. The model was developed by the World Bank and is now part of their DIA toolkit (though it is not on general release). The main inputs include; national data on economic indicators (total GDP, GDP contribution by sector), the power sector (expected demand growth), and general demographics (rural and urban population, electrification rates, etc.).
3. **Greenhouse Gas Abatement Cost Model (GACMO)** is a simple accounting model developed by the United Nations Environment Programme (UNEP) DTU to assist countries or regions in analysing their GHG mitigation options. GACMO requires less data than most other models and includes a specified list of technologies and example technology costs that can be used if country-specific data are not available.
4. **TIMES** – An optimisation model that aims to minimise the total costs of the energy system, including all end-use sectors, over a 40 to 50-year horizon and compute a partial equilibrium for the energy markets. TIMES models require large data sets including detailed information on the characteristics and costs of technologies and fuels in all sectors of the economy over all time periods, and are usually developed incrementally by research groups over many years.
 - A version of **TIMES** has been used for the latest National Energy Strategy
5. **Enerfuture model** is a bottom up model that provides energy projections through 2050. The model covers five-sectors; Agriculture, Energy, Industrial Processes, Services and Transportation. It can be linked to other models; like long-term Marginal Abatement Cost Curves (MACC) to generate the different levels of emissions reductions that can be reached for different carbon price levels for a given year, country and sector.

Additional model:

6. **ENPEP-BALANCE** – a nonlinear equilibrium model that matches the demand for energy with available resources and technologies. The functionality of the ENPEP model can be used for energy policy evaluation, including assessments on pricing, efficiency, renewable potential and overall energy sector strategy.
 - This model was used for Jordan's NC1, NC2, NC3 and NDC.

Whilst it can be used to model energy supply and demand and work out what the take up of renewable is under different energy prices, it is essentially a dynamic simulation of generation dispatch system used by Grid Management companies. It provides a top down estimation of

³⁰⁰ Formally known as Long-range Energy Alternatives Planning model

energy demand and as such, it is not well suited for modelling mitigation measures. However, given its extensive use in Jordan to date it will be included in the review for completeness.

5.2 Assessment criteria

Our high-level assessment criteria for the model review are below:

1. Model usage

- a. How widely used is the model for other LTS (widely used, moderately used, rarely used)
- b. Has the model been applied previously in Jordan, and with what success (yes – very successful, yes – moderate success, no)?

2. Accessibility and Support

- a. Level of skill needed (High, medium, low)
- b. Availability of guidance / training (High, medium, low)
- c. Location of available experience (academia, consultancy, owner model)
- d. Support options: Consultants (only), academic/think tanks (only), governments (only)
- e. Cost / Pricing (free, annual licence fee, per run service charge)
- f. Languages documentation/training available in (English, French, Arabic, Others)

3. Data Requirements

- a. Volume of data required (High, medium, low)
- b. Time steps used in model: e.g. 5-yearly, yearly, month, day, minute etc.
- c. Categories of input data required: GDP data, engineering data, price elasticities, historical energy demand, GHG emissions, production data, etc.
- d. Data already included or readily available: energy prices: technology costs (capital, fixed operation and maintenance, variable operation and maintenance), CO₂ costs etc.
- e. Fall back options (if national data not available) and its impacts e.g. international data.

4. Detailed information

- a. Timeframe (short term horizon, medium term, long term)
- b. Geographical coverage (Global, Regional, National, Sub-national, Project, Local)
- c. Sectors/sub-sectors covered (number or list, e.g.: Energy Supply, Industry, Services (Commercial & Public), Residential, Transport, Agriculture (AFOLU), Waste)
- d. Technologies & Mitigation Measures covered (number or list)
- e. Ability to add new measures: Yes/No/Difficult
- f. Linkages to other models: (List of hard linked and soft linked models)
- g. Useful links: Suppliers website, example applications or case studies.

5.3 Assessment method

To assess which of the modelling tools discussed in the preceding sections is most relevant to Jordan, we adopted a four-step approach, which involved identifying:

- The nature of the modelling work to be conducted and timescales for completion
- The type(s) of model that were best suited to these applications based
- Potential candidate modelling tools from a list of widely used models
- Refining the selection based on specific requirements identified by users

Whilst potentially there were a large number of modelling tools that could assist Jordan to develop its long term strategy, this approach enabled us to quickly narrow down the scope of our analysis to a small selection of candidate modelling tools that met the following key requirements:

- The time frame for long term strategy development was 6 to 12 months, which limited the scope to models that required considerable customisation and new data collection.
- The need for a range of stakeholders with varying degrees of technical and modelling expertise to be able to use the modelling tools in parallel, and to produce graphical outputs.

- The modelling tools not only needed to support the development of the overall national vision and long-term strategy for decarbonisation, but also support the development of sector models, particularly in those sectors where relatively little detailed data was available.

The considerations ultimately led us back to the list of five models which we identified at the start of the study, plus ENPEP-BALANCE, as pragmatically, these models were the ones that are most commonly being used by countries of similar economic size and development status to develop their long term strategies.

Table 42: A review of shortlisted models against each assessment criterion. ^{301, 302, 303, 304, 305, 306}

Element	Criteria	LEAP	EFFECT	GACMO	TIMES	ENERFUTURE	ENPEP-BALANCE
Model usage	How widely used is the model for other LTS	Moderately used	Rarely used	Rarely used	Widely used	Rarely used	Rarely used
	Has the model been applied previously in Jordan, and with what success	Yes - moderate success	No	No	Yes - very successful but concerns about financing	No	Yes - very successful
Accessibility and support	Level of skill needed	Low	Medium	High	High	Low	Low-Medium
	Availability of guidance	High	High	High	Medium	Not available	High
	Location of available experience	Consultancy	Check with World Bank	Public sector	Public sector	Model owner	Consultancies, academia.
	Support options	Not available	Check with World Bank	Not available	Consultants, academics	Not available	Consultants, academics, government.
	Cost / Pricing	Free for developing countries, students, academic organisations and NGOs	Free	Free	Free	Higher prices for commercial licences than educational licences. Extensive training required.	Available to purchase

³⁰¹ GIZ (2017), "Methodological approach towards the assessment of simulation models suited for the economic evaluation of mitigation measures to facilitate NDC implementation":

[https://d1v9sz08rbysvx.cloudfront.net/ee/media/assets/simmodel-methodological-approach-\(web\)_20180214.pdf](https://d1v9sz08rbysvx.cloudfront.net/ee/media/assets/simmodel-methodological-approach-(web)_20180214.pdf)

³⁰² Pye, S. and Bataille, C. (2016) 'Improving deep decarbonisation modelling capacity for developed and developing country contexts', *The Deep Decarbonization Pathways Project: Insights and Emerging Issues*, 16(1), pp. S27-S46. Available at: <https://core.ac.uk/download/pdf/79523551.pdf>

³⁰³ Hall, L.M.H. and Buckley, A.R. (2016) 'A review of energy systems models in the UK: Prevalent usage and categorisation', *Applied Energy*, vol.169, pp. 607-628.

³⁰⁴ INOGATE (2015) "Review of energy systems models": http://www.inogate.org/documents/3.2_Energy_Models_Brizard_ENG.pdf

³⁰⁵ Ringkjøb, H-K. *et al.* (2018) 'A review of modelling tools for energy and electricity systems with large shares of variable renewables', *Renewable and Sustainable Energy Reviews*, vol.96, pp. 440–459.

³⁰⁶ Also see references in the "Useful links" row at the bottom of the table

	Languages documentation/training available in	English, French, Spanish, Portuguese and Chinese	English	English	English	English	English
Data requirements	Volume of data required	Low-Medium	Medium	Medium	Extensive	Low	Medium-High
	Time steps used in model	Annual	Annual	Annual	User defined	Annual	Annual
	Categories of input data required	National population data; Rates of urbanisation; Average household sizes; GDP/GNP data; Value added by sector/subsector; Interest rates; Energy consumption and production by sector and fuel; Emission factors from GHG inventories; National energy policies/plans	National data on economic indicators (total GDP, GDP contribution by sector), the power sector (expected demand growth), and general demographics (rural and urban population, electrification rates, etc.).	The GHG balance for the chosen country is needed. The annual growth in defined periods is needed. Discount rate. Energy prices for crude oil, all distillates, coal, lignite and natural gas. Calorific values and GHG emission factor for all fuels. CO2 emission factor for electricity production. Global Warming Potential.	A complete scenario consists of four types of inputs: energy service demand curves, primary resource supply curves, a policy setting, and the descriptions of a complete set of technologies.	Energy resources; Power generation; Emission profiles; GDP; Population; Oil and gas resources; Technology costs	Energy system structure, Base year energy flows and prices, Energy demand and growth projections, Technical and policy constraints
	Data already included or readily available	LEAP's built-in calculations handle all of the "non-controversial" energy, emissions and cost-benefit accounting calculations	Two example applications for Brazill and Gambica are available at: https://github.com/worldbank/DIA-toolkit - Last used/updated in 2017.	Most of the yellow cells in the model contain default values that can be overwritten.	For the global versions of TIMES, the main drivers are: Population, GDP, GDP per capita, number of households, and sectoral outputs. For sectoral TIMES models, the demand drivers	Future energy demand prices and GHG emissions by energy source or by sector. Large amount of data if subscribed. Three detailed scenarios available, updated yearly, offering contrasted views on technological development, on effort in developing low-	The Ministry for Energy and Mineral Resources used ENPEP-BALANCE to conduct the GHG mitigation analysis presented in Jordan's First National Communication to the UNFCCC.

					may be different depending on the system boundaries.	carbon energy sources and on fossil fuels supply.	
	Fall back options (if national data not available) and its impacts	The SEI Energy Modelling team has created a set of national level "starter" data sets for LEAP.	Not known	Enerdata.net can be used to get input data for the country.	Not known	A subscription to yearly data is available	Not known
Detailed information	Timeframe	Medium- to long-term	To 2050	Short, medium or long-term	Medium- to long-term	To 2050	75 years maximum
	Geographical coverage	Local, national, regional, global.	National	Global	Local, national, regional, global.	Global	National
	Sectors/sub-sectors covered	All sectors (incl. industry, transport, household, service and agriculture)	Power generation, transport, household electricity consumption, non-residential, and industry	Agriculture, Energy, Industrial Processes, Transportation	Energy Supply, Storage, Transport, Residential	Agriculture, Energy, Industrial Processes, Services, Transportation	Energy sector and end-use sectors (residential, industry, agriculture and fishing, transport)
	Technologies & Mitigation Measures covered	All renewable technologies, all storage technologies	Not known	All the GHG mitigation options are located according to the types, and subtypes used in the CDM pipeline (www.cdmpipeline.org).	Highly detailed representation of technologies	EnerFuture can be linked to the MACC: Long-term Marginal Abatement Cost Curves to generate the different levels of emissions reductions that can be reached for different carbon price levels for a given year, country and sector.	Wide range of sector-specific technologies/mitigation options
	Ability to add new measures	Yes	Not known	No - but these get updated	Yes, as required.	No	Yes, as required.
	Linkages to other models	OSeMOSYS	Part of World Bank Distributional Impact Analysis (DIA): Toolkit	Enerdata.net	Various CGE models (hard & soft linked)	POLES, Marginal Abatement Cost Curves - MACC	Not known

	<p>Useful links</p>	<p>http://www.energycommunity.org/</p> <p>https://leap.sei.org/default.asp?action=trainingmaterials</p>	<p>http://documents1.worldbank.org/curated/en/773061467995893930/pdf/102363-PUB-VN-Low-cost-carbon-date-Jan-20-2016-9781464807190-Box-394380B-PUBLIC.pdf</p> <p>http://documents1.worldbank.org/curated/en/595361468279331555/pdf/735080ESMOP2710disclosed01107020120.pdf</p> <p>https://openei.org/wiki/Energy_Forecasting_Framework_and_Emissions_Consensus_Tool_(EFFECT)#:~:text=Energy%20Forecasting%20Framework%20and%20Emissions%20Consensus%20Tool%20(EFFECT).-From%20Open%20Energy&text=EFFECT%20is%20an%20open%2C%20Excel,the%20regional%20and%20national%20levels.</p>	<p>http://www.cdmpipeline.org/</p> <p>https://ndcpartnership.org/toolbox/green-house-gas-abatement-cost-model-gacmo</p> <p>https://unepdtu.org/wp-content/uploads/2020/12/english-guidelines-for-the-gacmo-tool-november-2020.pdf</p>	<p>http://iea-etsap.org/index.php/etsap-tools/model-generators/times</p>	<p>http://www.enerdata.net/enerdatauk/knowledge/</p> <p>http://www.enerdata.net/enerdatauk/knowledge/</p>	<p>https://unfccc.int/resource/cd_roms/na1/mitigation/Module_5/Module_5_1/b_tools/ENPEP/ENPEP_GHG_Guidebook_Version_9a.pdf</p> <p>https://www.energyplan.eu/othertools/national/enpep-balance/</p>
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5.4 Assessment findings

Having reviewed a selection of models that are commonly used for NDCs, LTSs, and other similar work, we concluded that no one model can meet all of Jordan's requirements, so there is a need to develop a suite of models that can be used to fulfil this range of needs.

From these findings, we conclude that a combination of a simple spreadsheet tool, an accounting tool and a hybrid top-down model may cover most of Jordan's needs. In relation to Jordan's likely mitigation pathways (see section 3.2), a simple spreadsheet model (such as 2050 Calculator or GACMO) would likely suffice for the development of a baseline or BAU scenario. A slightly more complex accounting tool (such as LEAP) may be needed to model a moderately ambitious scenario, while a more comprehensive hybrid model (e.g. TIMES) would be needed to simulate more rapid transitions (such as the deep decarbonisation pathway discussed in section 3.2).

However the development of a hybrid model such as TIMES, whilst offering the most robust modelling tool, would require more time than may be available to develop the LTS. TIMES would require a considerable amount of primary data collection, and extensive validation by independent experts. Jordan could consider the use of TIMES in the longer term.

6 Recommendations

A pragmatic approach should be adopted when selecting modelling tools, and it should be recognised that using a selection of modelling tools can help improve the robustness of the long term strategy.

For modelling at national level, an accounting-type modelling tool is a useful way of bringing together the results of sector level modelling exercises done with models that best represent the complexity of the sector's energy supply and demand. The energy supply sector is the prime example of where an accounting type model is unlikely to be able to model the complexities of the integration of variable renewable generators (e.g. wind generation and solar PV) and a more detailed simulation is needed.

In recommending an accounting type tool, the obvious choice is LEAP, but the previous experience of its use in Jordan was less than satisfactory for various reasons. However, LEAP can be extended using SEI's NEMO (Next Energy Modelling system for Optimization) which puts powerful optimization features within reach of planners, energy analysts, and others who are not full-time modelers³⁰⁷.

In addition, we would recommend that a simple spreadsheet tool based on the 2050 Calculator (or GACMO) should be used to help develop and visualise the pathways being explored as part of Jordan's Long Term Strategy, as this will help a wider range of stakeholders to understand some of the investment choices and mitigation options available to Jordan both at a national and sector level.

If desired, on-line modelling tools such as the Global Calculator, could also be used to explain the long-term strategy in terms of global and regional efforts to limit Green House Gas (GHG) emissions.

At national level, it will also be important to have an independent method of assessing the technical potential of different mitigation measures and of identifying the optimum pathway from an overall economic perspective. In this context, a hybrid model based on the TIMES model seems the best option as Jordan already has experience in its use. As the development time of a TIMES based model is typically at least 2 years – this option should be revisited after the draft strategy is ready.

Finally, it would be best practice to cross-check key assumptions including the economic forecasts made in LEAP with the output of another modelling tool like ENERFUTURE for consistency with international scenarios. However ENERFUTURE does not have Jordan specific data at present, so discussions would need to be held with the supplier to see if they can add this. Also, if a TIMES based modelling approach were to be used, some form of validation process is likely to be needed. One possibility is to ask Jordan's academic institutions to challenge the assumptions through the use of an integrated assessment model for example using MESSAGE-GLOBIOM or similar. Alternatively

³⁰⁷ See here for more details: <https://www.sei.org/projects-and-tools/tools/nemo-the-next-energy-modeling-system-for-optimization/>

independent consultants could be used to validate the assumptions used in the TIMES model as was done in the UK, where two sets of consultants were asked to Quality Assure the models Inputs, Assumptions and Output using their own models.

A4 LTS modelling tools questionnaire

LTS modelling tools questionnaire	
<i>Please do not feel limited to only the answer options suggested. Feel free to provide any additional comments or information that you feel might be useful to understand in the process of selecting a modelling tool/tools.</i>	
Name:	
Position/role:	
Department:	
Modelling questions	
1.	What existing models have been used in the country already and for what purposes? (e.g. compilation of national communication or NDC, energy planning)
<i>Answer</i>	
2.	To what extent do you want the modelling for the LTS to align with or support other activities e.g. drafting the NDC?
<i>Answer</i>	
3.	What timeframe do you want the modelling tools to cover exactly? <ul style="list-style-type: none"> a. <i>Up to 2025</i> b. <i>Up to 2030</i> c. <i>Up to 2050</i>
<i>Answer</i>	
4.	What time intervals do you need to model in (as a minimum)? <ul style="list-style-type: none"> a. <i>Every 10 years</i> b. <i>Every 5 years</i> c. <i>Every year</i> d. <i>Other (e.g. every year to 2030 then every 5 years)</i>
<i>Answer</i>	
5.	Sectoral coverage: Which sectors do you want to model? <ul style="list-style-type: none"> a. <i>All sectors (i.e. Energy Supply & End Use Sectors)</i> b. <i>Sectors responsible for the largest share of GHG emissions</i> c. <i>Specific sectors</i> d. <i>Other</i>

<i>Answer</i>	
6.	For each of the sectors covered, how would you rate the data quality and availability in each? <ul style="list-style-type: none"> a. <i>High</i> b. <i>Medium</i> c. <i>Low</i>
<i>Answer</i> Example: Transport - Medium	
8.	Who would lead the modelling exercise? <ul style="list-style-type: none"> a. <i>Government</i> b. <i>Academia</i> c. <i>Consultants</i> <ul style="list-style-type: none"> a. <i>National</i> b. <i>International</i>
<i>Answer</i>	
9.	For each of the sectors covered, are there sufficient experts available to feed into the modelling process? In each case indicate where these experts are based. Eg. From within the government, from academia, from a consultancy etc. <ul style="list-style-type: none"> a. <i>Yes</i> <ul style="list-style-type: none"> i. <i>Government</i> ii. <i>Academia</i> iii. <i>Consultancy</i> iv. <i>Other</i> b. <i>No</i>
<i>Answer</i> Example: Transport – Yes: Government	
10.	Is your priority in this modelling process to understand the development and interaction of specific technologies as a result of certain mitigation measures (bottom-up approach) or the broader economic implications and impacts (top-down approach) or both (hybrid approach)? <ul style="list-style-type: none"> a. <i>Technologies (bottom-up)</i> b. <i>Economy (top-down)</i> c. <i>Both (hybrid)</i>
<i>Answer</i>	
11.	What timeframe are you working to complete the modelling in? E.g. 6, 12, 18 months?
<i>Answer</i>	
12.	Is there budget available to purchase a license for a modelling tool or tools?

<i>Answer</i>	
13.	Are there any specific outputs you require? <i>a. Optimisation pathway (e.g. highest emission reductions at least cost)</i> <i>b. Costing of mitigation options (e.g. MACC curve)</i> <i>c. Other</i>
<i>Answer</i>	
14.	Do you need to be able to link the model with any existing model(s) (if applicable)?
<i>Answer</i>	
15.	Do you want the review to consider the benefits of using a combination of modelling tools? (including which ones work well together).
<i>Answer</i>	
16.	Please provide any additional comments/information that you think would be useful to understand in the process of selecting a modelling tool or tools.
<i>Answer</i>	

Annex 5 – Institutional and Governance Arrangements

1 Introduction

Institutional and governance arrangements are a critical component for both the effective development of the LTS, and its implementation, management and future update. Ensuring it is ‘owned’ and embedded, with clear roles and responsibilities identified will ensure the LTS has longevity and is taken up effectively across ministries, departments, agencies and other stakeholders.

This chapter draws on literature and international best practice to understand the scope of ‘good governance’ considerations, that may be relevant to Jordan’s LTS. It aims to review how these considerations are best applied in practice, through the use of country specific case studies. The intention is to equip Jordan’s national decision-makers with the knowledge of effective governance and institutional arrangements.

Long-term planning for climate adaptation and mitigation requires tailored governance and institutional arrangements, thus this chapter aims to propose a governance structure for Jordan’s LTS. The proposed institutional arrangements and recommendations for Jordan stem from governance studies and best practice, all within the context of Jordan’s national circumstances and existing political systems.

What does ‘institutional and governance arrangements’ mean?

Institutional arrangements and governance describe the organizations, mandates and processes in place to support the country’s climate response. These might include:

- Collecting and analysing data to assess impacts, understand and secure appropriate action
- Designing and implementing action to address climate change, at national and sectoral level
- Monitoring and evaluation, and reporting processes
- Decision-making, planning, coordination
- Addressing of cross-cutting issues, adjustment of priorities and activities
- Consultation, participation and implementation
- Legal and policy frameworks and regulations^a

Governance is broadly defined as the exercise of economic, political and administrative authority to manage a country’s affairs, comprising the mechanisms, processes and institutions. **Institutional arrangements**, on the other hand, both formal and informal, are the structures that exist or are put in place to ensure accountability and transparency in governance, including standing committees, statutory bodies, internal and external audit requirements in individual government agencies, citizens’ forums and so on.^b

Well-functioning institutional arrangements are flexible and sustainable, and they facilitate a consistent and continuous flow of data, engage national and subnational expertise, ensure coordination between institutions, and drive recurring, engaging and continuously improving outputs.

^a Adapted from “Handbook on institutional arrangements to support MRV/transparency of climate action and support”, Consultative Group of Experts, United Nations Framework Convention on Climate Change secretariat June 2020
https://unfccc.int/sites/default/files/resource/Hand%20book_EN.pdf

^b Adapted from World Economic and Social Survey 2014/2015 https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/2015wess_ch6_en.pdf

Box 15: What does institutional and governance arrangements mean?

The diagram in Figure 6-1 below shows some of the key governance considerations of LTSs and their relevance to the Jordan LTS process.

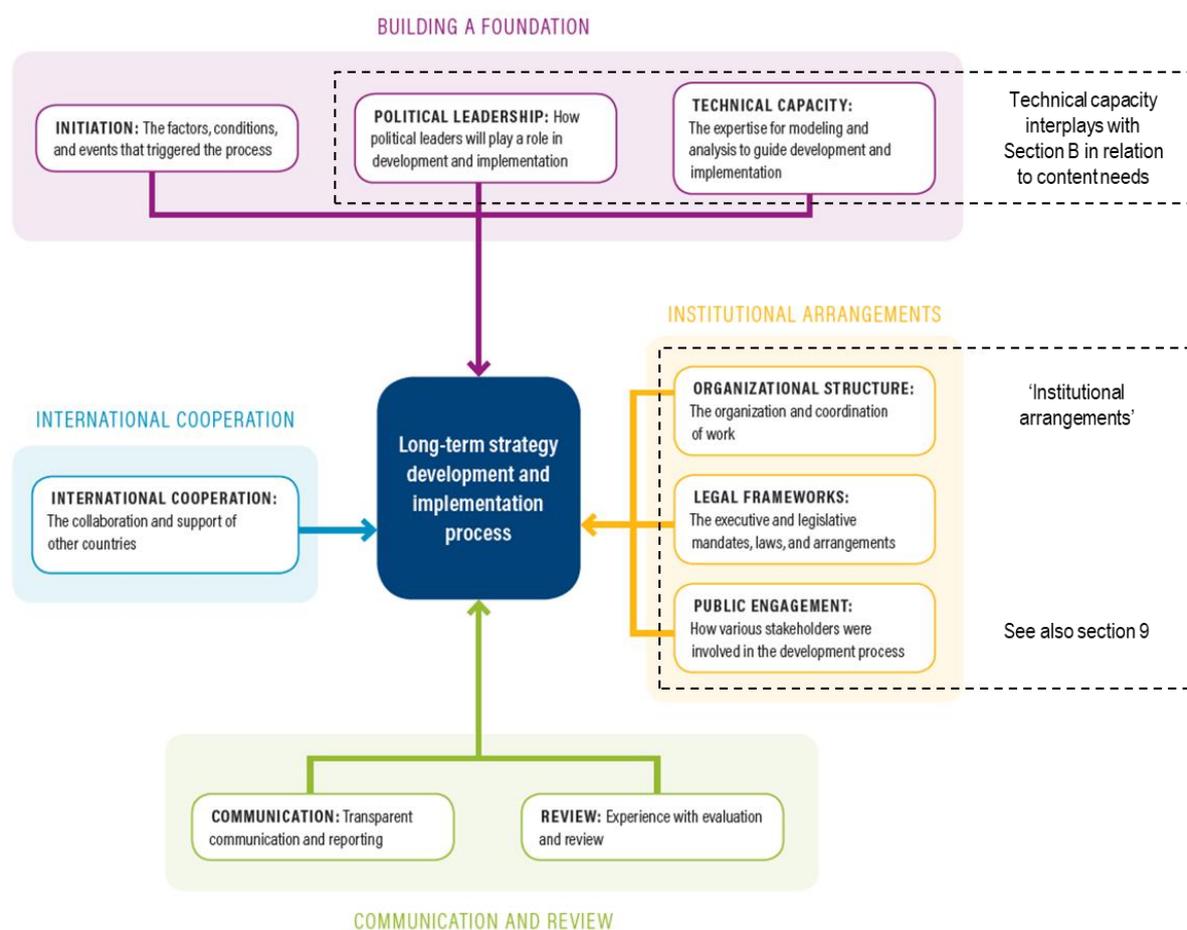


Figure 26: Governance Considerations of Long-Term Strategies

Source: Adapted from WRI (2019)³⁰⁸

2 Further details on Guiding Principles for Good Governance in LTSs

Long term climate planning requires an effective governance system, as decisions made today have a magnitude of effects in the long term. Countries' governance structures bridge the decisions of today to the long-term climate implications. This raises multifaceted governance challenges, which may require high-level political leadership, engagement across a wide range of ministries and stakeholders, and supportive legal frameworks. To ensure Jordan is equipped for these challenges, it is useful to draw on country examples and guidance, such as the World Resources Institute (WRI) who have explored some key principles to consider when developing an LTS, including³⁰⁹:

- Institutional framework
- Political leadership
- Technical capacity
- Legal frameworks
- Stakeholder engagement

³⁰⁸ WRI (2019), 'Good governance for long-term low-emissions development strategies', <https://www.wri.org/publication/good-governance-long-term-low-emissions-development-strategies>

³⁰⁹ Ibid.

2.1 Institutional framework

LTSs require a high level of intragovernmental cooperation across a variety of actors and institutions, at multi-levels and branches of government. **It is crucial to foster a cross-governmental approach when planning an LTS to maximise available in-country resources**³¹⁰. This approach will encompass the participation and coordination across several branches of government, institutions, and ministries e.g. the Ministries of Environment, Planning, Energy, Local Administration, Transport, Agriculture, and Finance for example.³¹¹ It's important to note this list is not exhaustive and may include a broad range of other state and non-state actors, in particular sub-national governments (the Greater Amman Municipality, for instance). In practice, this presents many coordination challenges, where Ministries may be competing for the same budget or pushing for different priorities, for example, hence a cooperative and cross-governmental approach is needed.

Institutional arrangements differ between countries and should be country specific. Some countries have built on existing structures and some have developed new structures, summarised in

Benefits of strong institutional arrangements range from supporting decision-making to enhanced and efficient reporting. Strong institutional arrangements will enable critical long-term national capacity to:

- Inform national decision makers on progress on climate action and the level of climate ambition
- Equip decision makers with the continually improved evidence they need to choose the right course of action and secure investments. Actions must work in harmony with national development strategies and the SDGs
- Provide reliable information to the international community through regular national reporting which, among other functions, shows national achievements in planning and implementing ambitious climate action, contributes to building trust and understanding, and attracts public and private investment
- Fulfill international reporting requirements in a timely manner and on a sustainable basis

There is no one-size-fits-all model for institutional arrangements. Systems should be designed and tailored such that they will be sustainable under the respective national circumstances.

"Handbook on institutional arrangements to support MRV/transparency of climate action and support", Consultative Group of Experts, United Nations Framework Convention on Climate Change secretariat June 2020
https://unfccc.int/sites/default/files/resource/Hand%20book_EN.pdf

Box 16: Benefits of strong institutional arrangements

³¹⁰ OECD (2019) Key questions guiding the process of setting up long-term low-emission development strategies, <https://www.oecd.org/environment/cc/Key-questions-guiding-the-process-of-setting-up-long-term-low-emissions-development-strategies.pdf>

³¹¹ GIZ (2020), 'Making Long-Term Low GHG Emissions Development Strategies a Reality', https://newclimate.org/wp-content/uploads/2020/05/GIZ_NewClimate_LTS_GuideForPolicyMakers_2020.pdf

Table 6-1 below³¹².

The approach is dependent on the context of the country and how well-developed existing governance structures were before developing an LTS – for example, for NDCs or national climate policy development. This could be a key consideration for Jordan when deciding whether the existing governance structures are sufficient, or if the LTS development process could provide an opportunity to enhance institutional arrangements.

Key learnings from county case studies suggest that building on existing arrangements can promote credibility, ensure priorities set by the LTS are consistent with sector-specific conditions, and preserve capacity.

Table 2-1: Comparison of approaches to institutional arrangements

LTS built upon existing institutional arrangements	LTS provided an opportunity to organise new structures	LTS utilised informal or hybrid arrangements
United States, Mexico, France, Germany, United Kingdom	Malta, Burkina Faso	South Africa, Costa Rica
Governmental structures were developed through former cross-governmental efforts to establish particular climate policies, laws, or strategies.	New Structures developed to bring together stakeholders via specific committees or groups, or creation of a completely new entity established by a new law that subsumed multiple entities into one (Malta).	Ad hoc multi-stakeholder teams formed to focusing on management, research, technical advice, and facilitation (South Africa) or developed without a formalized set of arrangements or coordinating body (Costa Rica).
Efficient in preserving technical capacity across the governmental structure, builds on existing arrangements and can create opportunities to develop synergies within the existing divisions. Using existing independent committees provides independent assessments of strategies and evaluation of progress, visibility and credibility (UK, Mexico).	Provides an opportunity to form a new cross-cutting coordinating body and overcome previous fragmented and conflicting processes or entities - defining a new structure, function, and mission to better develop synergies, policy integration, and a cross-sectoral approach to long-term planning (Malta).	Brings together the necessary expertise quickly and efficiently to deliver the required outputs (South Africa). Where there was no legal mandate to develop the plan, some sectors sought to be exempted from the plan (Costa Rica).

Institutional structures vary between countries and there is no one size fits all approach. However, there are some recommended common elements³¹³. An example of a typical institutional set-up for an LTS is found in Figure 27 below. The structure distinguishes between the national government,

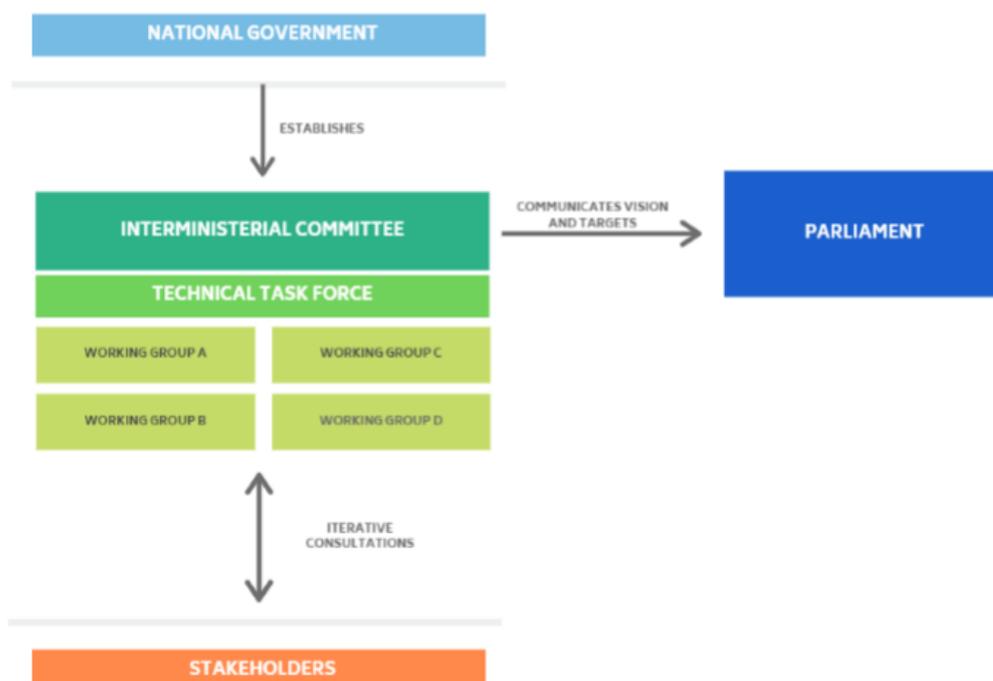
³¹² WRI (2019), 'Good governance for long-term low-emissions development strategies', <https://www.wri.org/publication/good-governance-long-term-low-emissions-development-strategies>

³¹³ OECD (2019) Key questions guiding the process of setting up long-term low-emission development strategies, <https://www.oecd.org/environment/cc/Key-questions-guiding-the-process-of-setting-up-long-term-low-emissions-development-strategies.pdf>

inter-ministerial committees, parliament and stakeholders. The figure also identifies the relationship between the different actors.

This includes:

- ✓ **Government/political leadership.** Setting the development of the LTS as a priority for the country, while highlighting the broad scope and links between the LTS and multiple national objectives (e.g. development and green growth) may enable a ‘whole-of-government’ approach to the LTS. Leadership, the mandate to develop the LTS, and delegation of responsibilities (including the inter-ministerial committee) will stem from the political leadership, who will also themselves need to be “bought in” to the need for an LTS and the process of developing one.
- ✓ **An independent public committee, body, or task force to coordinate the implementation of the LTS.** An independent entity would ensure active engagement both horizontally, across all ministries and divisions and, vertically, across national, sub-national, city and local levels. Establishing a self-governing body could gain buy-in across different political parties as the institutional set up is independent of any political agenda. The introduction of such a public entity may be supported by a legal framework, such as the UK Climate Change Act (2008) which introduced the Committee on Climate Change (CCC). The CCC has provided continuity throughout different governments, ensuring the strategy is not amended or removed by political parties.
- ✓ **Technical support to the committee via a task force and technical working groups.** The development of the LTS will require new or revised technical knowledge and assessments, which will need specialist knowledge and experience on, for example, mitigation pathways and adaptation options. Coordination of technical work via a technical body or task force, would likely be led from the Ministry of Environment, and supported by specific technical working groups (a group of experts who share a common goal) is a common approach. This should involve communication with relevant ministries and agencies to ensure the incorporation of technical knowledge of sectoral experts, adding to the credibility of the LTS. The Ministry of Finance would also be a key player in providing context to the strategies. Non-state actors would also play a role under the leadership of the line ministries such as via the working groups.
- ✓ **Strong stakeholder consultation and engagement processes spanning LTS development and implementation.** Robust and transparent stakeholder engagement can include collaborating across a very wide range of actors, including government agencies and



engaging with scientists, businesses, civil society, and the public. In addition to creating the support needed for the LTS in the short-, mid- and long-term, involving the public will also contribute to improving the quality and the feasibility of the strategy. Strong and consistent stakeholder engagement will increase public acceptance of the strategy, incentivising collective action for the achievement of its targets. Engaging with relevant stakeholders may prove fundamental particularly when designing policy pathways and building scenarios, as it can contribute to the development of more realistic, and therefore more implementable, options. Moreover, involving civil society could also be a way to make the process of design and implementation of the LTS less political, which could strengthen the ambition of the strategy.

Figure 27: An example of an institutional set-up for an LTS³¹⁴

Source: Developed by Ricardo Energy and Environment

2.1.1 Political leadership

Political leadership is defined by the WRI as '*the level of governmental authority required to advance or sustain the LTS process*³¹⁵'. Several countries who have submitted LTSs have stressed the importance of high-level, visible political leadership in mobilising government actors, establishing technical bodies, and raising public awareness. Countries who have high-level political endorsement include for example, Canada and Mexico, where the prime minister and president led the development of the long-term strategies, strengthening political recognition. In Costa Rica, New Zealand, and Sweden, the heads of states provided strong mandates for the development of long-term strategies. In other cases, the initiation of the LTS and high-level political mandate was driven by a specific issue or event, such as:

- Chile: The IEA undertook an in-depth review of Chile's energy policy and published recommendations in 2009 to develop a holistic long-term energy strategy
- Australia: The Australian and Queensland governments released the Reef 2050 Long-Term Sustainability Plan in response to the World Heritage Committee's recommendation that Australia develop a long-term plan to protect the reef.
- Colombia: Extreme drought led to a water and energy crisis that resulted in extensive blackouts, triggering a re-engineering of the country's electricity system and its long-term energy planning.

Political leadership can originate from several levels of government depending on the country context. Generally, high-level leadership is derived from parliamentary roles, that can establish subcommittees.³¹⁶ Additionally, parliament can pass laws requiring long-term plans and approve budgetary resources needed for implementing policies. This leadership can be supported by ministries, who lead on objectives and targets laid out in sector-specific terms and actions. Therefore, reinforcing this idea that a whole governmental approach is key, as it requires collaboration across different ministries and local, sub-national and national levels at all stages of the LTS development. See Figure 6-2 for the different levels of political involvement throughout the lifetime of an LTS.

Supportive and strong leadership is pivotal in launching the LTS process, as it can provide the necessary direction to ensure the process involves multi-levels of government. It is essential to gain political buy-in, from the offset.

Initiation

Development

Implementation

³¹⁴ OECD (2019) Key questions guiding the process of setting up long-term low-emission development strategies, <https://www.oecd.org/environment/cc/Key-questions-guiding-the-process-of-setting-up-long-term-low-emissions-development-strategies.pdf>

³¹⁵ WRI (2019), Good governance for long-term low-emissions development strategies, <https://www.wri.org/publication/good-governance-long-term-low-emissions-development-strategies>

³¹⁶ OECD (2020), Long-term low emissions development strategies. Cross-country experience, https://www.oecd-ilibrary.org/environment/long-term-low-emissions-development-strategies_1c1d8005-en

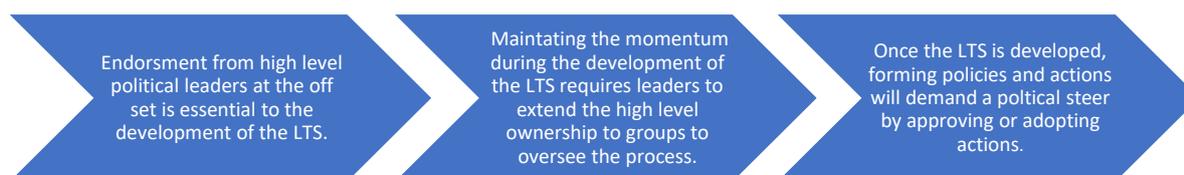


Figure 28 Political leadership during the development of the an LTS

Source: Developed by Ricardo Energy and Environment

2.1.2 Technical capacity

Technical capacity is at the heart of the LTS, as its development demands high levels of technical know-how to produce, for instance, models and forecasts to feed into mitigation and adaptation pathways. This technical leadership may come from state actors (e.g. line ministries and agencies) or non-state actors (e.g. sector-specific groups, academic institutions, think tanks, NGOs, and international experts including consultants). This co-ordination of key actors requires good governance to engage with a wide range of groups to support the LTS across all sectors. A lack of good governance and structures to integrate technical actors can run the risk of bad data control, lack of transparency, and restricted data information flows. A leading entity is required to set out a process or build on existing processes, such as robust QA checks and consistent data handling. Not only does this provide a strong foundation for the LTS to deliver high-quality data sets for emission pathways but adds credibility to the LTS pathways on a national and international stage.

Four (plus an additional suggested 5th) common features are important for building and sustaining this technical capacity for LTSs³¹⁷:

6. **Durable institutions:** Capacity is sustained by housing researchers in durable institutions that allow researchers sufficient time to develop experience. National laboratories, scientific societies, research institutions, or universities can play such a role.
7. **Sustained financial support:** A stable supply of funding can sustain analytical capacity and continual support for development and improvement.
8. **Analysis, interpretation and application:** Technical capacity not only depends on the capacity to undertake the analysis itself, but also the capacity and willingness to interpret and use results for policymaking.
9. **International engagement:** Countries with little current analytical experience, as well as those with substantial analytical capacity, may benefit from participating in international modelling and analysis activities as a means of continuing to learn and build capacity.
10. **Practice makes perfect:** *Building technical capacity to undertake an LTS will grow over time and with practice. For instance, countries with a longer history of decarbonisaton pathways modelling and participation in other deep decarbonisation projects, have found the modelling experience influential in their LTS development.*

Key questions for Jordan to ask in establishing institutional arrangements and governance around technical capacity are shown in Table 2-2.

Ensuring the key 'in house' technical departments, agencies, non-government entities and individuals who contribute or could contribute to the LTS technical elements, have a clear and formalised role will help to ensure the embedding of individuals for longevity of technical knowledge and skills in Jordan.

³¹⁷ WRI (2019), Good governance for long-term low-emissions development strategies, <https://www.wri.org/publication/good-governance-long-term-low-emissions-development-strategies>

Table 2-2 Key considerations for technical capacity

Key considerations for Jordan
What technical capacity is needed and is there adequate technical capacity at the domestic level to conduct an LTS?
Are there existing analytical teams or processes that could feed into the LTS development, and, if not, where else could this capacity be sourced?
Who are the key entities or individuals who have the necessary technical capacity to undertake analysis for an LTS?
How can domestic expertise be further developed and sustained?

2.1.3 Legal frameworks

Some countries have utilised recently passed laws to mandate institutional arrangements (e.g. France, Mexico, and the United Kingdom), including creating new institutions or coordinating structures, stakeholder and public engagement modalities, technical capacity development, and monitoring and evaluation functions in addition to setting long-term climate goals. While some countries have accomplished this without a new law, having a legal framework can provide clarity of goals, responsibilities, timelines, and help to transcend political changes and ensure long term planning. Having a legal basis for the LTS can induce action in ways a non-legally binding policies cannot. For instance, it can encourage a review of organisational decisions, clarification of roles and responsibilities, establishment of processes or strengthening of capacities. Outside of government, it also sends signals about future intentions to business and the public. Examples include the Mexico General Climate Change Law (2012) which mandated the development of a climate change strategy, and the French 2015 Act on the Ecological Transition and Green Growth.

An additional guiding principle is mainstreaming a long-term strategy into national laws (WRI,2020)³¹⁸. This can yield institutional credibility, link synergies between relevant government ministries, and promote transparency between the long/short term policy. Not only can this align with policies and create synergies within state structures but can also transcend a political commitment at a sector level (e.g. industries, businesses and investors).

A new executive decree could provide a powerful mandate for Jordan to define roles and responsibilities and enhance connectivity between previous climate plans on a sectoral level.

2.1.4 Stakeholder and public engagement

The final element of good governance relates to stakeholder and public engagement. It is important to note that stakeholder engagement is a key element of governance, and undertaking this throughout the LTS development will result in a more robust and transparent strategy. Comprehensive engagement includes collaborating with various actors, such as government agencies, the public, scientists, businesses, and vulnerable groups. This could be done through different measures, including workshops, public consultation roundtables, multi-stakeholder sessions, information-sharing protocols, and surveys.³¹⁹ A bespoke stakeholder engagement process should be developed to reflect the social and cultural context of Jordan. The OECD Climate Expert Group states ‘it is important for the stakeholder engagement process to be designed as an iterative process that allows for a dynamic exchange of views and to facilitate a shared vision’.³²⁰

Adopting these measures can enable contributions from actors in different sectors and multi-levels of government, thus increasing the capacity for knowledge sharing and unifying the country’s shared

³¹⁸ WRI (2019), Good governance for long-term low-emissions development strategies, <https://www.wri.org/publication/good-governance-long-term-low-emissions-development-strategies>

³¹⁹ The Coalition of Finance Ministers for Climate Action (2020), “Long-term strategies for climate change: A review of country cases”: <https://www.financeministersforclimate.org/sites/cape/files/inline-files/Helsinki%20Principle%20%20-%20Review%20of%20Long-Term%20Transition%20Strategies%2010July2020.pdf>

³²⁰ OECD (2020), Long-term low emissions development strategies. Cross-country experience, https://www.oecd-ilibrary.org/environment/long-term-low-emissions-development-strategies_1c1d8005-en

vision. It is commonly cited in literature that one of the challenges associated with LTS engagement is the lack of communication vertically and horizontally between state and non-state actors. This poses risks for governments as some actors may be duplicating efforts. Clear communication can yield benefits including, well-informed decision-making, identifying where overlaps occur and transfer of knowledge.

Regarding international best practice (see table 2), different approaches have been adopted. Pacific island, Fiji³²¹ has held three National stakeholder consultation workshops in the development of their LTS. A wide range of stakeholders provided feedback on proposed plans. On the contrary, Germany developed a bottom-up approach, randomly selecting 500 citizens to discuss the proposed Climate Action Plan³²². To ensure ideas and views are shared freely in an open environment, it may be useful to set up bilateral stakeholder sessions alongside multi-stakeholder sessions. This ensures stakeholders are comfortable in sharing sensitive issues. An example of this is South Africa, where stakeholder consultations were held under Chatham House Rules³²³.

It is key to conduct consistent stakeholder engagement throughout all stages of the LTS. This will increase public acceptance of the strategy as problematic decisions like transitions that may affect a sector or proportion of businesses adversely. This ensures that difficult decisions are made openly and transparently. Public engagement is the foundations of good governance and can mandate better decision-making outcomes for those affected³²⁴.

Table 2-3: Examples of country specific stakeholder processes

Country	Stakeholder Process
France Low-Carbon National Strategy	An ad hoc Council for the Energy Transition (CNTE), was institutionalised by law. This council included representatives from business, NGOs (environmental, social, and consumer organizations), trade unions, subnational authorities, and members of the National Assembly and Senate. A plenary of more than 130 representatives was created, which met monthly. In addition, the CNTE had a consultative body of 50 people with six constituencies: businesses, trade unions, environmental NGOs, caritative and consumer NGOs, local authorities (elected representatives), and members of parliament. Independent experts supported the plenary and working groups.
South Africa Long Term Mitigation Scenarios	In South Africa, business, industry bodies, civil society, labour, academia, local governments, and government agencies were involved in the scenario-building team. In addition, there were several high-level round tables for government (including the directors general of various government departments), civil society (including a dozen major NGOs, research, faith-based, and civic organizations), labour, and business. These round tables were aimed at communicating the LTMS results across the country's leadership.
Botswana Vision 2036	A country-wide consultation process was undertaken, with Kgotla meetings, these were forums for the community, and focus group discussions were held to get consensus. Over the course of developing the strategy, 103 localities were visited.

Source: Ricardo Energy and Environment

³²¹ Ibid.

³²² Ibid.

³²³ Government of South Africa (2020), "Low Emission Development Strategy":

<https://unfccc.int/sites/default/files/resource/South%20Africa%27s%20Low%20Emission%20Development%20Strategy.pdf>

³²⁴ WRI (2019), Good governance for long-term low-emissions development strategies, <https://www.wri.org/publication/good-governance-long-term-low-emissions-development-strategies>

3 Summary of international institutional and governance arrangements

Country	Political leadership	Institutional framework	Legal framework	Committees	Technical capacity
Mexico ³²⁵	The Minister of Environment mandated the process	<i>Existing</i> Leadership within the Ministry of Environment and Natural Resources with coordination and support from the National Institute of Ecology and Climate Change (INECC)	General Law on Climate Change	Climate Change Interministerial Commission	INECC serves as a technical hub for climate-change modelling and analysis for government agencies at the national and subnational level—in effect, supporting capacity building for mainstreaming and policymaking
South Africa ³²⁶	Cabinet (President, the Deputy President, and Ministers) signed a mandate for the long-term mitigation scenario (LTMS) after the 2005 National Climate Change Conference.	<i>Existing</i> Department of Environmental Affairs and Tourism managed the LTMS process. The Department deputy director general chaired the project management team	National Climate Change Bill, determines a national greenhouse gas emissions trajectory for South Africa and the greenhouse gas thresholds that will determine carbon budget liability	The Interministerial Committee on Climate Change	Department of Environmental Affairs had a strong academic modelling team that used actual industry data in many instances Department of Environmental Affairs produced scenarios with a 70-member multi-stakeholder body
Costa Rica ³²⁷	President made a direct request to the Minister of Environment and Energy to undertake the process Bottom-up demand from civil society for decarbonization	<i>New / none</i> The Climate Change Directorate assigned to oversee the development process developed without a formalized set of arrangements or coordinating body		Intend to form a "Government Center" team, to operate from the Presidency to facilitate the implementation of the Plan. This group will be composed of political authorities and their appointed technical teams and will have representation from the Presidency,	Developed by a small team within the Ministry of Environment and Energy, the Office of Climate Change, the Ministry of Planning, the University of Costa Rica, and a few external consultants

³²⁵ Available at: https://unfccc.int/files/focus/long-term_strategies/application/pdf/mexico_mcs_final_cop22nov16_red.pdf

³²⁶ Available at: <https://unfccc.int/sites/default/files/resource/South%20Africa%27s%20Low%20Emission%20Development%20Strategy.pdf>

³²⁷ Available at: <https://unfccc.int/sites/default/files/resource/NationalDecarbonizationPlan.pdf>

Country	Political leadership	Institutional framework	Legal framework	Committees	Technical capacity
France ³²⁸	The Minister for Ecological Transition launched a strategic exercise known as “the revision process”	<i>Existing</i> Ministry for an Ecological and Inclusive Transition, second only to the Prime Minister’s Office in authority, was mandated with leading the development of the strategy.	Law on the Energy Transition for Green Growth cnte	MIDEPLAN, Finance and MINAE High Council on Climate Change - an independent advisory body – which will advise the government on policy and hold it accountable if legislation is out of step with the country’s climate commitments	France’s CNTE— consisting of 50 members of equal representation across six constituencies: businesses, trade unions, environmental NGOs, consumer interest NGOs, locally elected authorities, and members of parliament—contributed throughout the LTS development process.
Germany ³²⁹	Initiated out of a political compromise to accommodate more progressive political factions that were arguing for a national climate-action law	<i>Existing</i> Developed and coordinated by the Federal Ministry for Environment, Nature Conservation, and Nuclear Safety, which has the mandate to address climate policy.			The Federal Environment Agency within the ministry commissioned scientific studies resulting in visions and targets
Vietnam (LTS not yet submitted)	The 2011 National Climate Change Strategy highlighted the high level of climate-related vulnerability in the country Wanted to explore integrated approaches for long-term adaptation		Prime Minister Resolution 120 (Defines a sustainable and climate-resilient development 2100 vision and a set of objectives for 2050)		

³²⁸ Available at: https://unfccc.int/sites/default/files/resource/en_SNBC-2_complete.pdf

³²⁹ Available at: https://unfccc.int/sites/default/files/resource/Klimaschutzplan_2050_eng_bf.pdf

Country	Political leadership	Institutional framework	Legal framework	Committees	Technical capacity
K ³³⁰	Under the Climate Change Act, the government was required to produce a plan describing policies and actions to meet the fourth and fifth carbon budgets and also to be on track with its 2050 target	<i>Existing</i> Department for Business, Energy and Industrial Strategy, was responsible for preparing the LTS	Climate Change Act sets long term reduction target and carbon budgets in law	The UK Climate Change Committee (CCC) an independent body that advises on emission reduction targets and how they can be achieved, monitors progress toward reaching long-term targets, and reports progress to parliament	An extensive evidence base was collected for the report, including new published sources, responses to a Call for Evidence, input from three expert advisory groups and results from ten new research projects commissioned for the report.
Ethiopia ³³¹	Formed under the leadership of the Prime Minister's Office	The development of the Climate Resilient Green Economy initiative was led by the Prime Minister's Office, the Environmental Protection Agency, and the Ethiopian Development Research Institute		Ethiopia's Environmental Council, which is chaired by the Prime Minister and comprises members drawn from Federal Ministries, Presidents of National Regional States, and representatives of non-governmental bodies, the private sector, and trade unions	Included seven sectoral teams involving over 50 experts from over 20 government institutions Analytical work was carried out by Sub-Technical Committees
Czech Republic ³³²	EU Member States are bound by the obligations arising from the European Parliament and Council Regulation No 525/2013 of 21 May 2013 and the related implementing EU legislation, including the preparation of the National Low Emission Strategy and the establishment of a national system for policies, measures and projections.	<i>New</i> Ministry of the Environment and the National Committee for an Energy Transition, together with the Czech Hydrometeorological Institute play a coordinating role	The Climate Protection Policy of the Czech Republic was adopted by the Government resolution No. 207	Coordinated through an interministerial working group established for the development of the policy	Responsibility for the functioning of the National Inventory System is borne by the Ministry of the Environment, which has conferred on the Czech Hydrometeorological Institute the responsibility for coordinating the preparation of the greenhouse gases inventory for emissions and removals.

³³⁰ Available at: <https://unfccc.int/sites/default/files/resource/clean-growth-strategy-amended-april-2018.pdf>

³³¹ Not submitted to the UNFCCC as an LTS. CRGE document available at: <https://www.undp.org/content/dam/ethiopia/docs/Ethiopia%20CRGE.pdf>

³³² Available at: https://unfccc.int/files/na/application/pdf/cze_climate_protection_policy_summary.pdf

Country	Political leadership	Institutional framework	Legal framework	Committees	Technical capacity
Burkina Faso ³³³		<p><i>New</i></p> <p>The Permanent Secretariat of the National Council for the Environment and Sustainable Development</p>	Decree 2015-1189/PRESTRANS/PM/MERH/MEF	Established an interministerial technical monitoring committee led by the Permanent Secretariat of the National Council for the Environment to lead their NAP	Interministerial working group (including also business and NGOs) was established for the development and implementation of the policy
Fiji ³³⁴		<p><i>Existing (modified)</i></p> <p>Flows from the National Climate Change Policy (NCCP) of 2018 and are aligned with those of other national climate change related strategies, such as NAP.</p> <p>The Climate Change and International Cooperation Division (CCICD), Ministry of Economy</p> <p>Engaged GGGI to support the LEDS in early 2018</p>	The National Climate Change Act will provide a legal anchor and further formalize the governance and oversight of the National Climate Change Plan's objective	<p>National Climate Change Coordination Committee</p> <p>CCICD invited 14 government ministries and agencies to the Fiji LEDS Steering Committee - will have high level oversight. Comprises Permanent Secretaries and nominated representatives from government ministries, departments, and 28 agencies</p>	<p>Climate Change Division directed a multi-sector task force that brought together expertise from across Fiji's Government to integrate adaptation and risk management</p> <p>Mitigation work was driven by the Ministry of Economy, a research institution as technical lead, other government agencies and international experts</p> <p>Plan to establish - Private sector advisory board; Steering Committee; focal points from all ministries</p>

³³³ Not yet submitted

³³⁴ Available at: https://unfccc.int/sites/default/files/resource/Fiji_Low%20Emission%20Development%20%20Strategy%202018%20-%20202050.pdf

Country	Political leadership	Institutional framework	Legal framework	Committees	Technical capacity
Finland ³³⁵	Based on the Climate Change Act, the Government shall approve a medium-term plan for climate change policy once per electoral term.	Ministry of Economic Affairs and Employment oversees the work and compiles the LTS together after public consultations	The Climate Change Act obligated the development and update of climate strategies	The Government Programme of the Prime Minister established a Ministerial Working Group on climate and energy issues, which will oversee all climate policy preparations, as well as a round table on climate policy in connection with the sustainable development committee Also established the Finnish Climate Panel, an independent, scientific expert body	Each sectoral ministry is responsible for the preparation of climate and energy strategies with regards to their respective remit Government research institutions, universities and consultants provide sectoral studies, modelling, impact assessments etc funded by ministries
United States ³³⁶	President Obama (US), Prime Minister Trudeau (Canada), and President Peña Nieto (Mexico) announced that all three countries would develop mid-century LTSs within the year at North American Leaders' Summit US experts saw the mid-century strategy (MCS) as an opportunity to explore the potential for long-term deep emissions reductions in order to guide near-term policies and investment decisions	<i>Existing</i> Developed by 'an interagency group' led by the White House, Executive Office of the President			Drew together an expert team with modelling capacity from within the U.S. Environmental Protection Agency as well as expertise from the Department of Energy and its National Laboratories, the Department of Agriculture, the Department of State, and the Department of Transportation

³³⁵ Available at: https://unfccc.int/sites/default/files/resource/LTS_Finland_Oct2020.pdf

³³⁶ Available at: https://unfccc.int/files/focus/long-term_strategies/application/pdf/mid_century_strategy_report-final_red.pdf

From the above principles of good governance and country examples, the following key components for effective LTS governance can be identified:

Table 3-1: Components of effective LTS governance

Entity	Role	Relationship
National Government	Political leadership	Important for initiation of the LTS process, leadership, and ensuring it has due emphasis and visibility at the highest level
Parliament	Can establish subcommittees to put climate planning on the policy agenda or to pass laws requiring long-term plans and to approve budgetary resources required for implementing the policies and plans.	Important for political buy in of LTS goals and country ownership; providing the legal mandate or requirement to act; ensuring the provision of resources and delegation of responsibilities
Inter-ministerial Committee	Oversight and management of the LTS development process. Post-development, provides the enabling environment for priority actions. Acts as executing body for projects and programmes. Provides support and advice to the project. Provide co-financing to projects and programmes	Important for country ownership; overseeing the process; ensuring alignment with existing country plans and strategies
Technical Task Force / Technical agency	A technical public body or group that provides substantial technical inputs and coordination of the LTS. Effectively the 'technical lead' tasked with the development, and ongoing monitoring of implementation and future updating. Could be a designated agency within the Ministry of Environment, or an external agency.	Important to ensure active engagement both horizontally, across all ministries and divisions and, vertically, across national, sub-national, city and local levels; also important for coordinating the necessary technical inputs and processes and keeping these updated.
Working Group(s)	Technical teams formed for the development of key technical inputs to the LTS development e.g. for mitigation pathways, modelling, climate scenarios, vulnerability & risk assessments, public engagement etc. Post-development, act as an executing body for projects and programmes. Provide support and advice to projects.	Lead on the technical inputs to the LTS process including e.g. mitigation modelling, like risk assessment, action identification. Support the implementation of actions with stakeholders.
Stakeholders	Inform the development process to ensure incorporation of existing strategic priorities, goals and actions, and shaping future priorities. Should be included as part of a representative panel in ongoing monitoring and implementation of the LTS. Implement the actions identified in the LTS.	Important for ensuring the LTS is inclusive, and is integrated into country plans, policies, and strategies, and responses by government and non-government actors including private sector entities. Important to engage in order to ensure the LTS is understood and supported in order to implement actions.
Independent committee or scientific panel	An independent expert panel or committee of scientists and experts drawn from across government and non-government bodies e.g. academia, research groups, think tanks, scientific associations. Provides quality assurance of the LTS; objectively assess progress through e.g. annual performance reviews and reports; provide recommendations to enhance or adjust actions or policies, and recommendations for future updates.	An independent scientific body important for ensuring the integrity of the strategy, holding the implementers to account and ensuring it is fit for purpose and responds to the latest science.

4 Information to develop Jordan's institutional and governance arrangements: existing structures and functions

International experiences provide insights into the governance needs and considerations for Jordan's LTS but building on existing institutional and governance arrangements is preferable for providing credibility, familiarity and enhancing buy-in to the process, retaining knowledge, maximising efficiencies, and ensuring consistency with sectoral strategies and other climate reporting.

4.1 Jordan's institutions and structures

The Ministry of Environment was established in 2003 to oversee all environmental affairs. Since then the country has witnessed a steady expansion of the legal and institutional framework for environmental protection. The Ministry of Environment is the UNFCCC focal point and is primarily responsible for overseeing the policy and legal frameworks that guide climate change mitigation and adaptation efforts of the country, including the development of the National Communications and BURs to the United Nations Framework Convention on Climate Change (UNFCCC) and the Nationally Determined Contributions (NDCs).

The National Climate Change Committee (see below), established in 2001 by decision of the prime minister, is mandated to monitor the progress in the implementation of the Climate Change Policy on the national level and the INDC (and the updated NDC once submitted). A large share of the objectives of the Policy are intended to be implemented through sector strategies under the responsibility of the sector's ministries (energy, water, agriculture, health, and others). Their progress will be monitored by each involved sector on the basis of the specific monitoring framework adopted in the respective sector's policies and strategies.

The Directorate of Climate Change (CCD) was established in August 2014. The Directorate acts as the institutional hub for coordinating all climate change activities in Jordan in relation to the UNFCCC. The core responsibility of the CCD is to reach out to stakeholders to develop actions for climate response and to incorporate the resulting policies into executive decision-making.

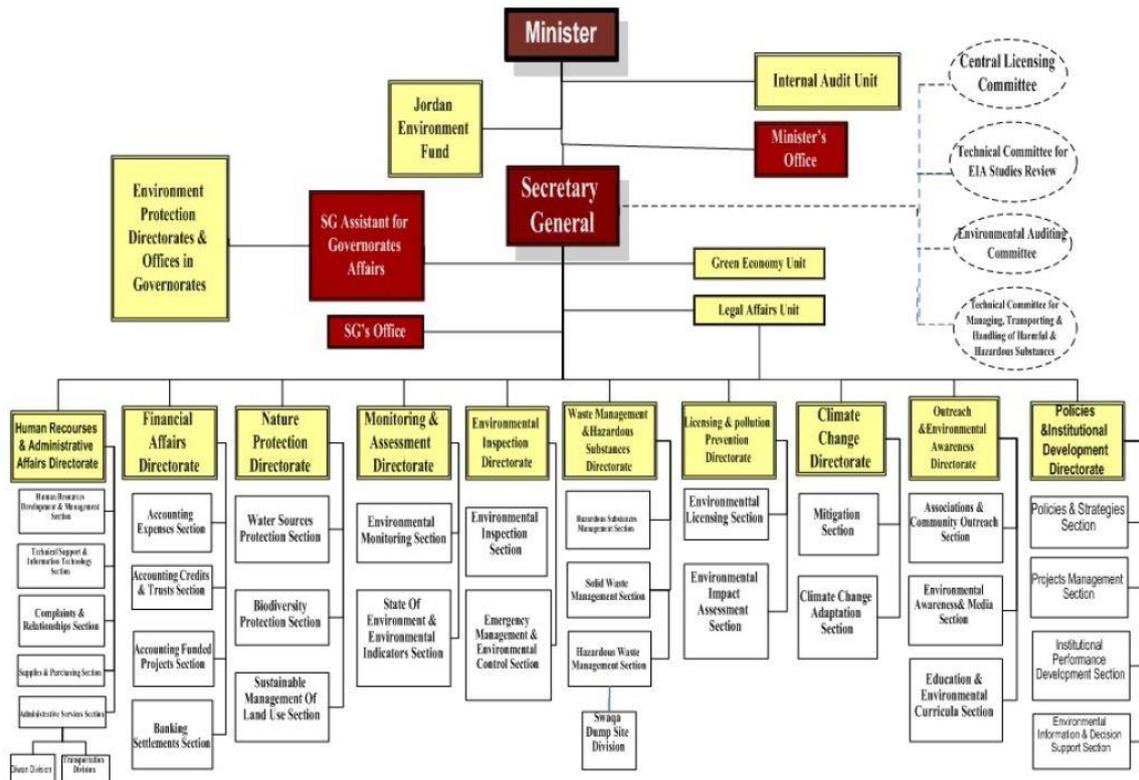


Figure 29: Ministry of Environment structure

Source: Royal Scientific Society of Jordan³³⁷

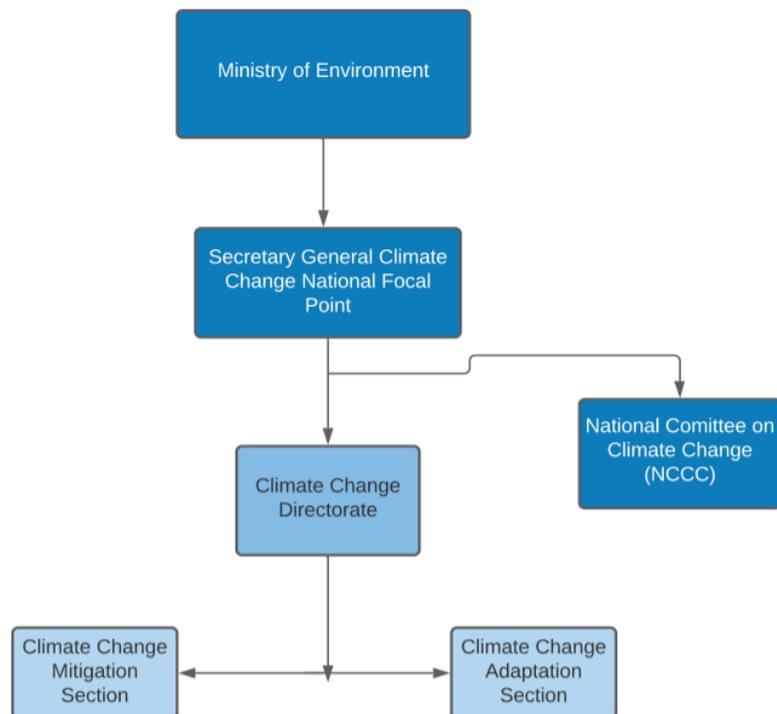


Figure 30: Jordan's Institutional framework for climate change

Source: Developed by Ricardo Energy and Environment

³³⁷ Personal communication

4.2 Jordan's climate policies and laws

The National Climate Change Policy (2013-2020) was issued in 2013 and provides guidance to sector strategies from a climate change perspective and provides a framework for coordination of climate change activities at the national level.

The Climate Change Bylaw: Based on the recommendations of the National Climate Change Policy, the Ministry of Environment revised the Environment Protection Law, no. 52 of 2006 to add new articles related to climate change and strengthen the existing articles. The new Environment Protection Law no.6 of year 2017, included provisions on climate change goals which later enabled the ministry to develop the Climate Change Regulation No.79, 2019 (the 'Climate Change bylaw').

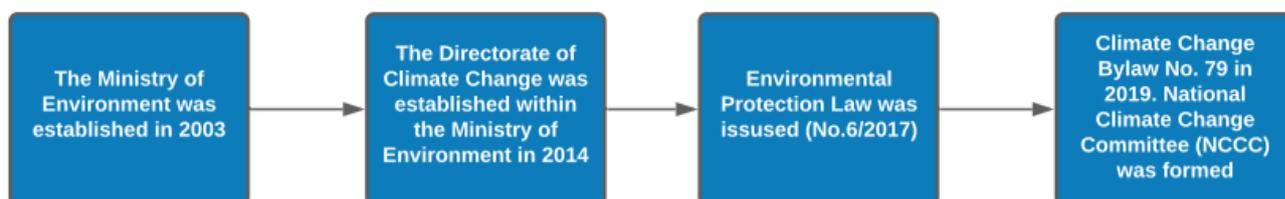


Figure 31 Jordan's governance timeline

Source: Developed by Ricardo Energy and Environment

4.3 Jordan's climate change institutional arrangements

The climate change bylaw came as a response to the need to define a framework that establishes a clear institutional setting to address climate change challenges and ensure full engagement of all partners and stakeholders including both the technical experts and the decision makers. The climate change bylaw aims to regulate:

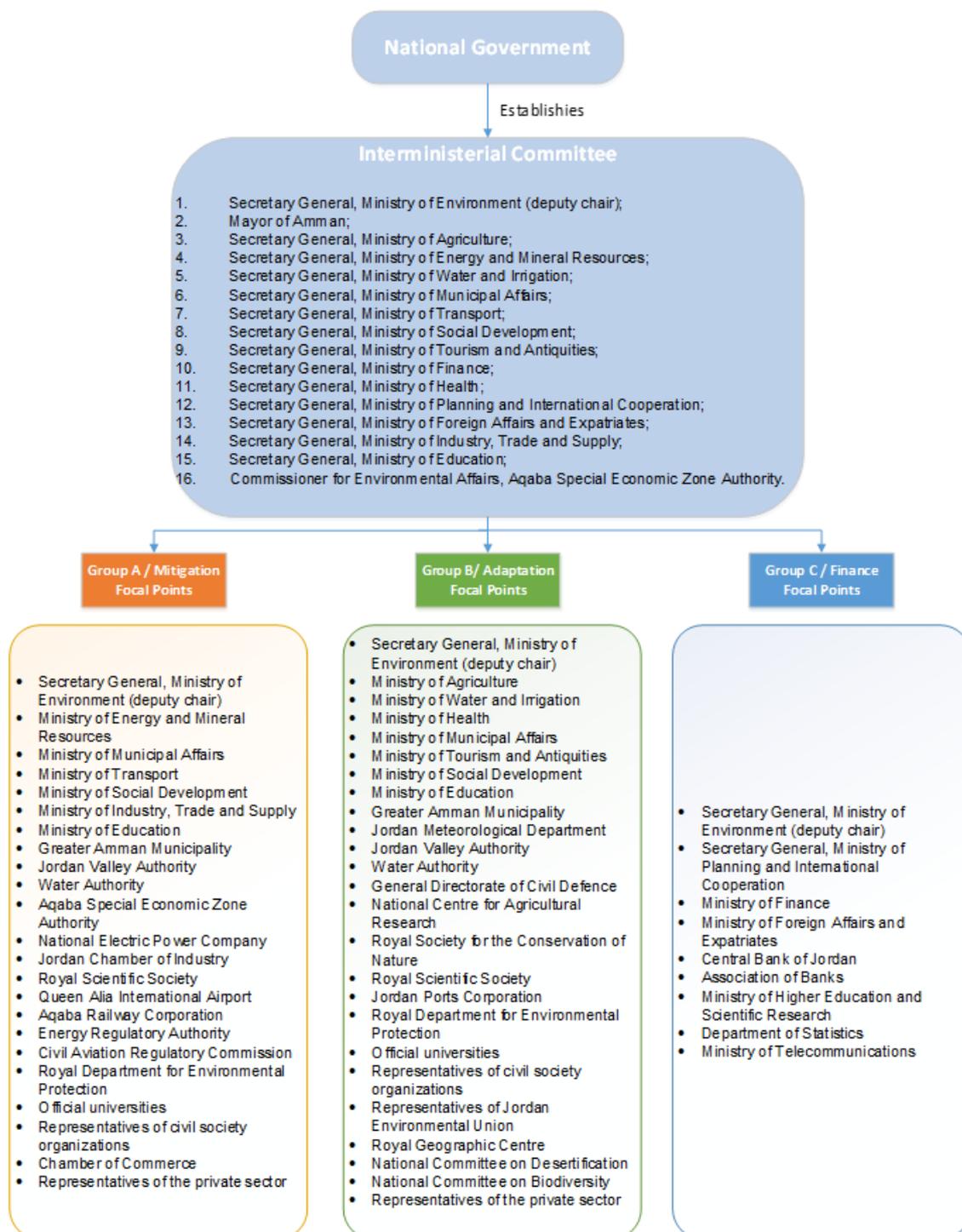
- a. the coordination of national efforts among relevant stakeholders to implement mitigation and adaptation measures
- b. the development of a legislative framework that maps out plans to combat climate change in the Kingdom and ways to implement them
- c. the streaming of climate change into national plans and the implementation of the goals and principles of the UNFCCC and the Paris Agreement.

According to the bylaw, the National Committee on Climate Change" (NCCC) which is chaired by the Minister of Environment and consists of 16 high-level members from relevant public authorities (shown in Figure 6-5 – Interministerial Committee), including the secretary generals. As before, this is the highest coordination body for climate policy but the bylaw mandated that bodies participating in the NCCC be represented at a higher level. It brings together stakeholders from different sectors, including several ministries, and partners from civil society, the private sector, and academia.

The NCCC's functions and powers are identified within the bylaw, including the power to form technical teams from governmental and non-governmental agencies represented by civil society institutions, research institutions, universities and the private sector institutions. These teams are nominated according to specific needs from the identified organisations but are not a permanent set of individuals. The teams are mainly tasked with supporting the Ministry of Environment with the NDC, the National Adaptation Plan and any other reports that should be prepared within Jordan's international commitments and assessing the capacity-building needs of relevant entities related to climate change and contributing to the implementation of awareness-raising and capacity-building activities.

The bylaw also set a group of entities mandated to support the Ministry of Environment with providing data, available at their entities, needed for GHG inventory estimation, NDCs and financial support tracking.

The NCCC therefore plays the main role in supervising the implementation of Jordanian climate policy. Several other entities also work on environment and climate change, such as the Meteorology Department, the Royal Scientific Society, the Royal Department for Environment Protection and the Greater Amman Municipality, the Aqaba Special Economic Zone, the Jordan Environment Society, the National Center for Agricultural Research and Extension, the Department of Vehicle Licensing and the Jordan Women National Council.



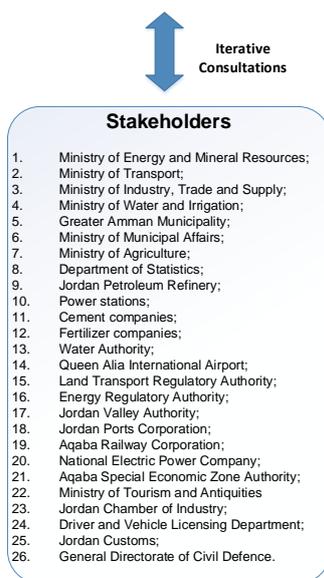


Figure 32: National Climate Change Committee

Source: Developed by Ricardo Energy and Environment

Specific institutional structures have also been implemented in the preparation of, for instance, Jordan’s first BUR. This was coordinated by the Ministry of Environment in partnership with UNDP, and an agreement with the Royal Scientific Society (a national non-governmental, not-for-profit organization for applied research). The GHG inventory development was accomplished with the participation of a pool of national experts representing different national entities, as demonstrated by the organizational chart in Figure 33. Analysis has identified that Jordan’s climate response studies and reports seem to be largely funded and coordinated by Western or multilateral aid donors, rather than developed ‘in house’ utilising the governance structures identified above. Jordan should seek to support the process at the national level and tasks should be arranged on continuous basis.

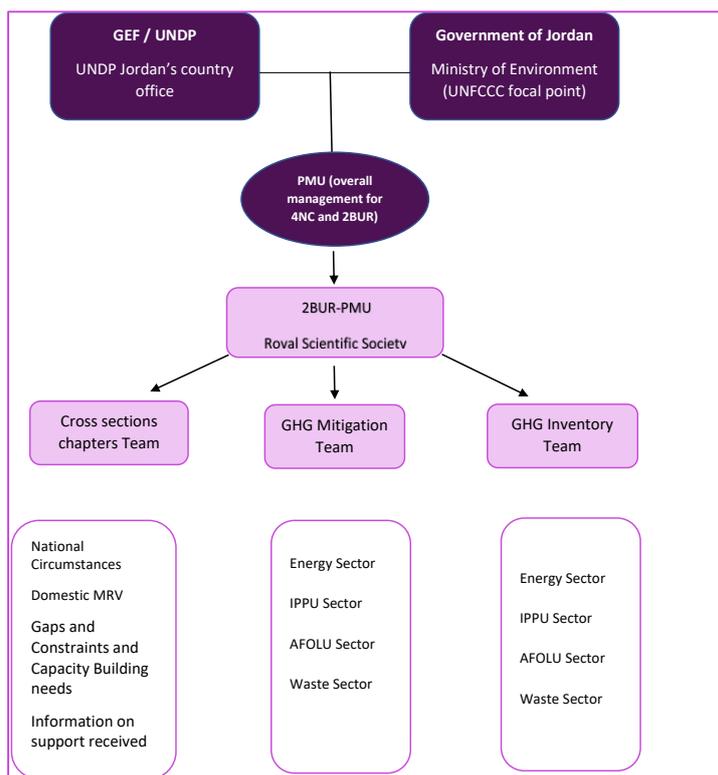


Figure 33: Jordan's Second Biennial Update Report institutional arrangements

Source: Developed by Ricardo Energy and Environment

At the national level many institutions have made progress in including climate change in their entities mandates. For example, many national institutions have established climate change directorates or units to follow up with the Ministry of Environment, such as the ministries of Agriculture, Water and Irrigation, Transport, The National Agriculture Research Centre, and The Royal Jordanian Geographic Centre.

Also, recently the Ministry of Environment signed an agreement with King Abdullah II Centre for Excellence to update the Environment Sustainability Award for industries to enhance their commitments towards environment protection including the reduction of GHGs.

The private sector is also engaging, with a unit for energy and environmental sustainability established in Jordan Chamber of Industry, through which they work with the industries and the government to encourage low emission technologies.

Sector strategies are also increasingly mainstreaming climate change, including the National Energy Strategy 2020-2030 (aims to reduce the emissions by 10% by 2030) and the Agriculture Development National Strategy 2020-2025 focused on adaptation and the impacts of climate change on biodiversity and land degradation. At the city level, Greater Amman Municipality in cooperation with Ministry of Environment and World Bank launched in 2018 “Amman Climate Plan - A Vision for 2050 Amman” (40% reduction of greenhouse gas emissions by 2030 and net zero by 2050).

However, there are some significant limitations that the country faces – outlined below.

Table 4-1: Summary of key roles and responsibilities within Jordan's climate change structures

Organisation	Purpose	Who
National Climate Change Committee members (16 entity and ministries)	<p>Plays the main role in supervising the implementation of the climate policy including monitoring progress</p> <p>Adopts proposals to implement international conventions</p> <p>Approves NDCs, NAPs and other report Jordan is obligated to provide</p> <p>Evaluates implementation of legislation and can propose essential new climate change legislation</p> <p>Approves sectoral actions plans</p> <p>Oversees the Partnership for Market Readiness, funding agencies, NGOs, and private industries and approves national climate finance strategy</p> <p>Approves adoption of new technologies and capacity building for stakeholders</p> <p>Has the power to form technical teams from governmental and non-governmental agencies, nominated according to specific needs e.g. NDC, NAP, other reports.</p> <p>May call upon experts or specialists to hear their views on matters under discussion and approves new research needed</p> <p>Responsible in securing effective and prompt feedback from respective sectors and institutions</p> <p>Maintains communication with policy makers/decision takers.</p> <p>Should meet at least twice a year.</p>	<ul style="list-style-type: none"> • Ministry of Environment • Ministry of Energy and Mineral Resources • Ministry of Planning and International Cooperation • Ministry of Local Administration • Ministry of Water and Irrigation • Ministry of Agriculture • Ministry of Health • Ministry of Tourism and Antiquities • Ministry of Industry Trade & Supply • Ministry of Finance • Ministry of Justice • Ministry of Interior • Ministry of Public Works & Housing • Ministry of Transport • Ministry of Digital Economy and Entrepreneurship • Ministry of Education
Ministry of Environment Climate Change Directorate	<p>The institutional hub for coordinating all climate change activities in Jordan in relation to the UNFCCC.</p> <p>Responsible for reaching out to stakeholders to develop actions for climate response and to incorporate the resulting policies into executive decision-making.</p> <p>Identifying the key sources of GHG emissions and the projected future development of emissions from each source.</p> <p>Identifying the outline of the existing institutional framework for mitigation measures.</p> <p>Analysing of the potential national response measures to abate the increase in GHG emissions.</p>	<p>Currently</p> <ul style="list-style-type: none"> • Director • Head of division for adaptation • Head of division for mitigation • Non-permanent project staff, supporting the climate change portfolio. For example: short-lived climate pollutants (UNEP); GCF Readiness project support staff (via GGGI permanent office); GIZ permanent office (climate change portfolio); UNDP staff
Focal points within the bylaw	<p>Annex 2 contact points must provide the following:</p> <ol style="list-style-type: none"> 1.Primary data essential for calculating emissions. 2.Information on sectoral climate change plans. 3.Information on measures to obtain national or international climate change funding. <p>Annex 2 contact points can also be called upon to form technical groups.</p>	<p>The Bylaw requires (in Annex 2) the nomination of one principal representative and one replacement representative appointed by each entity. They must meet the experience and qualification criteria provided.</p> <p>Annex 3 contains an additional 26 entities who are designated as activity data provided for the GHGI.</p>

Annex 3 entities are required to submit primary emissions data necessary for calculating the national emissions inventory.
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5 Further details on the limitations of Jordan’s existing climate governance

5.1 The bylaw is not functioning

Although the climate change bylaw was issued in 2019, it is not fully functioning yet. To date, the number of meetings between the NCCC and the technical teams has not been sufficient and no major decisions have been taken on the ground. Also, there are entities identified in Annex (3) of the bylaw who are responsible for providing needed data for the greenhouse gas (GHG) inventory estimation, however, only a slight improvement was detected in providing and facilitating collection of data and still more collaboration is needed.

Secondly, institutions included under the Annexes of the bylaw – such as the Jordan Meteorological Department – are not currently included in the committee. Bringing in technical organisations to the NCCC would provide a mandate to build their capacity and play a role in climate projections, vulnerabilities and in operating early warning systems.

The following recommendations have been included in the BUR2 (not yet published) to enact and activate the bylaw, its committee and technical groups:

- It is recommended that MoEnv as chair of the NCCC highlights continually the role of different ministries and institutions in the area of climate change and the need for cooperation to fulfil Jordan’s commitments.
- Seek support from international capacity building programs to enable and strengthen the committee and technical groups formed according to the climate change bylaw, in areas relevant to their roles.
- It is recommended to invest in building the capacities of the focal points acting in the technical groups and appoint them to their positions for a sufficient period of time (at least 3 years) to be able to strengthen their work and it’s highly recommended to prepare their successors in advance.
- CCDs at different ministries and institutions are important vehicles to mainstream climate change into the strategies and policies of their respective institutions. As such, it is recommended that the MoEnv coordinates continuously with these departments and supports them in identifying their capacity building needs.

5.2 Lack of capacity and awareness on climate change

The climate change agenda is not yet a priority in Jordan. The majority of Jordanian policymakers still don’t see climate change as a threat and most are not well aware of its consequences and humanitarian, economic and social costs, nor are they well aware of the benefits of formulating and implementing more ambitious climate action³³⁸.

According to the Jordanian government, poverty and unemployment are its major challenges in meeting its sustainable development goals. Yet, climate change would seriously hinder achieving the SDGs, including in rural areas, and undermine the progress that has already been made in reducing poverty. Similarly, a study of rural women found that their “theoretical knowledge and understanding of climate change and adaptation remain limited, impeding their ability and willingness to act and find long term adaptive solutions”.

³³⁸ Combaz, E. (2019). Jordan’s environmental policies and engagement on climate change. K4D Helpdesk Report. Brighton, UK: Institute of Development Studies.
https://assets.publishing.service.gov.uk/media/5d30a131ed915d2ff003b781/619_Jordan_Environment_Policies_and_Engagement.pdf

Building capacity amongst the highest-level decision makers will be critical to support the development and successful functioning of the LTS. Where there is capacity and knowledge of climate change amongst ministers and senior officials, climate change has been more successfully integrated into sectoral policies. The LTS development process should therefore ensure it builds in capacity development and clearly makes the link between climate and development.

Furthermore, ensuring capacity is retained 'in house' will be key to a more sustainable climate change response. Ensuring technical entity within the CCD, building in-house technical expertise that can maintain a stable, continuous approach and response and reduce reliance on third parties, consultants and international organisations is a desirable long-term goal.

Enabling the role of MOE with the staff of CCD will be the cornerstone for establishing a compatible climate change system that would generate its own monitoring systems & reports, with capacity building on transparency needs.

5.3 Legal and institutional limitations

At the NCCC, the Ministry of Environment does not have a veto right for all policies under discussion. This leaves the NCCC institutionally weaker than it could be and shows the limits to the policy commitment toward ambitious implementation of climate policies. In addition, attention to sectoral interdependence is not mainstreamed at the NCCC, for example when designing policies for sectors such as water, energy, and food³³⁹. The Ministry of Environment operates under the mandate of the Environment Protection Law passed in 2006 which does not specifically refer to climate change. Similarly, the Jordan Vision 2025 does not explicitly make a connection between climate change and the initiatives it lays out to strengthen line ministries' engagement with resource security and management in water, energy, food and agriculture³⁴⁰.

In addition, some key legal and procedural gaps have been identified for NDC implementation³⁴¹. Whilst relevant in the short term, overcoming these legal and institutional barriers in key sectors will support the longer-term goals of the LTS also.

³³⁹ACT Alliance (2018), Enhanced Climate Action in Response to 1.5°C of Global Warming. Scaling Up Nationally Determined Contributions, https://www.preventionweb.net/files/62199_actalliancereport1.5c.pdf

³⁴⁰Combaz, E. (2019). Jordan's environmental policies and engagement on climate change. K4D Helpdesk Report. Brighton, UK: Institute of Development Studies. https://assets.publishing.service.gov.uk/media/5d30a131ed915d2ff003b781/619_Jordan_Environment_Policies_and_Engage_mt.pdf

³⁴¹ ACT Alliance (2018), Enhanced Climate Action in Response to 1.5°C of Global Warming. Scaling Up Nationally Determined Contributions, https://www.preventionweb.net/files/62199_actalliancereport1.5c.pdf

Sector	Legal gaps	Potential legal reform
Renewable energy investments	Lengthy technical and administrative process to get a license for renewable energy projects; private-to-private transmission is not allowed; lack of awareness about available incentives	Clear and transparent administration practices; law reform to allow private-to-private (domestic or international) energy trade; clear communication about current incentives, e.g., through regional gatherings and the media
Energy efficiency	Weak monitoring mechanism for energy efficiency regulations Lack of awareness of the economic benefits of energy efficiency regulations	Strengthen the monitoring mechanisms by working in coordination with local regulators; regularly check for energy-intensive appliances; use more efficient communication tools to promote the benefits of energy efficiency
Public transport	Incomprehensive legal policies fragmented between different ministries and units No regulations for establishing a zero-emission public transport	Establish a high coordination mechanism between all these actors where the Ministry of Transport can take the lead; provide tax incentives for zero-emission public vehicles
Water	Not enough budget to implement proper wastewater and irrigation systems Weak water management regulations	Private sector partnerships to establish wastewater and irrigation systems; amendments on the water management law to prevent unsafe groundwater and aquifers usage; develop regulations related to greywater hazards
Agriculture	High overlap and inconsistency between the Agriculture Law and the Environmental Protection Law regarding land degradation	Harmonize Agriculture Law and Environmental Protection Law, and differentiate their mandates

Figure 34: Legal and Institutional barriers in sectors

Source: ACT Alliance (2018)³⁴²

5.4 Human resources

The CCD at the Ministry of Environment, as the UNFCCC focal point, plays a pivotal role in climate change activities at the national level. However, the directorate needs strengthening in term of human resources and sustainability. It is recommended to increase the number of the staff and enhance their capacity to be able to carry out their huge responsibilities in the long term. This would also limit the amount of 'outsourcing' of work and help retain institutional memory and technical skills.

One solution to this is building an in-house group of technical specialists that can be trained and retained in the Directorate to support sustainable climate policy and analytical work. This could operate as a dedicated unit and might also help overcome issues of high staff turnover.

This unit could be located outside of the Ministry of Environment and act as a standalone autonomous expert institution but should retain strong links and reporting through the CCD. Under the supervision of the Ministry, its role would be to empower decisions regarding climate change.

Strengthening & expansion of the CCD at MOE is however highly needed, and this would require several elements:

- Raising the number of well-educated and trained employees
- Legalising a work base and additional payment that would provide benefits (incentivise employees + maintaining sustainability of development + reducing the gap between civil servant & private sector salaries)
- Legalising the capability of MOE to contract and hire specialists according to their needs

³⁴² ACT Alliance (2018), Enhanced Climate Action in Response to 1.5°C of Global Warming. Scaling Up Nationally Determined Contributions, https://www.preventionweb.net/files/62199_actalliancereport1.5c.pdf

5.5 Unclear roles and responsibilities and coordination mechanisms

Despite the climate change bylaw there are not sufficient institutional arrangements in Jordan that define clear roles and responsibilities of different ministries with regard to climate change. Focal points and entities are not engaged and committed to its implementation, decisions have not been taken and few meetings have been held. It has the potential to be an effective mechanism to drive and coordinate Jordan's climate response if properly implemented.

One option is the establishment of CCDs at different ministries and institutions as important vehicles to mainstream climate change into the strategies and policies of their respective institutions. This will help avoid situations where climate becomes an additional burden for individuals on top of their day to day responsibilities. As such, it is recommended that the MoEnv coordinates continuously with these departments and supports them in identifying their capacity building and human resource needs. As above, it is also recommended that MoEnv as chair of the NCCC highlights continually the role of different ministries and institutions in the area of climate change and the need for cooperation to fulfil Jordan's commitments and invests in building the capacities of the focal points acting in the technical groups.

In previous experiences of both of the national Climate Change Policy and the NDCs, it hasn't been a mandated responsibility of each sectoral ministry. However, within the up-coming updated policy and updated NDCs the role of implementation and responsibility of each institution has to be identified, and via validating the NDC and climate change policy by the cabinet, it will become a mandatory plan in each ministry. Sector plans, mandated by the prime minister, could ensure entities address the LTS in the sector EDPs.

5.6 High turnover of staff and focal points

Jordan has faced a challenge of high turnover of staff, both technical and managerial, with government changes. This has limited the ability to retain institutional knowledge, build technical capacity and strengthen climate mainstreaming. It has also led to policies and strategies being superseded, which would need to be overcome for the LTS development. and strategies being superseded, which would need to be overcome for the LTS development. The climate change bylaw, for example, had some kind of disruptive effect that impacted negatively on the acquired technical capacities within the previous group of experts forming the previous NCCC; i.e. after issuing the bylaw and replacements of previous experts, the new nominations of climate change staff/focal points from 2019 onwards came at a critical time (i.e. ahead of NDC updating).

It is recommended that individuals identified as focal points in the bylaw are appointed to their positions for a sufficient period of time (at least 3 years) to be able to strengthen their work and undertake proper archiving and documentation of work and reports and meeting briefs. It is also highly recommended to prepare their successors in advance. Maintaining directors for a similar period or longer would also be beneficial. Additionally, staff climate change could be integrated into existing roles through, for example, amending job descriptions and departmental remits and reporting requirements, to ensure that it remains embedded.

There is also need is to enable the system inside each entity to well engage their development planning with climate change requirements and the LTS (e.g. NDC tracking , identifying the sector vulnerabilities and needs, reporting & archiving) in a way that would at the same time raise the efficiency of that institution towards climate change and would decrease the reliance on personal knowledge.

5.7 Disconnect between climate planning, and national planning and budgeting

The Ministry of Environment is mandated to coordinate climate change-related activities, but it is the activities of other sectoral ministries that are affected by, or have the potential affect, climate change.

Furthermore, MOPIC and the Ministry of Finance are in the driver's seat in defining national development priorities and formulating the national budget. There is therefore a disconnect between who is identifying, implementing and financing climate actions which leads to coordination challenges and lack of implementation.

The national budget does not include a specific allocation for climate change activities. In addition, MOPIC and the Ministry of Finance are the entities who engage with development partners and help maintain records of Official Development Assistance flowing to various sectors. There also is no effective coordination and information sharing regarding climate finance or integrating climate change into development planning at national, sectoral, and subnational levels.

MoE has had success in engaging on NDC priorities within sectoral EDPs (economic development plans) which are managed and directed by both MOPIC & Ministry of Finance. This mechanism could be built upon for the LTS.

MOE is also the national focal point for two important climate funds (GCF & Adaptation Fund) and will issue a country programme for the GCF soon. An ongoing national & international discussion is ongoing that will lead to budgeting a climate change line by the ministry of finance in the budget of MOE and might be extended to other ministries. MOE are presently reviewing the achievements of the previous NDCs and updating the NDC with GIZ, and there is the potential to conduct outreach with all entities to close the gap on knowledge of already financed climate change projects.

5.8 Poor integration and knowledge in local governments

There is little integration at present between local and national government action on climate change. Despite many local governments undertaking their own climate plans and implementing actions, these are not integrated with national strategies and there is no integrated MRV of climate action.

Given that some of the longest time horizon climate plans are at subnational level, and many actions will be implemented locally (plus the need to engage citizens), it will be important to ensure collaboration and integration with local governments in a governance structure for the LTS.

In addition to this gap, the last two or three cabinet turns were discussing the merge of the entire MOE within a multi candidate ministries . As Jordan is in a transitional period of new structured bodies, the government of Jordan are trying de-centralization of governorates, and within that there is a requirement to have a climate change action plan at each to be systemized and mandated by the ministry of local administration.

5.9 Lack of civil society engagement and input on climate change

Currently the structures of the NCCC and nominated groups under the Annexes do not include opportunities for civil society engagement and input on climate change, nor wider industry groups or private sector stakeholders (only as. for example, data providers. Under Article 6 activities, companies were invited to join capacity building efforts, but this was not formalised.

The main and critical point in Jordan's previous environmental work that it hasn't had a clear identification of more than 112 NGOs, or a clear identification and expertise of the NGO entities themselves. However, 2 or 3 and those are officially mandated within the ministry in other themes. Climate change in Jordan was constrained previously to renewable energy and energy efficiency without empowering action on adaptation.

Private sector engagement has occurred on Article 6 issues via MOE, and fully engaged in implementing all climate change projects that have been implemented via other ministries like MEMR or MWI or projects via MOE. It would give an additional value to include the private sector but requires the identification of private sector entities and a willingness from their side to participate.

A climate 'Association' or other form of interest group or advisory board for the private sector would help support wider engagement on the transitions needed. Additionally, a dedicated committee in

parliament and a dedicated civil society group to drive the agenda with citizens would also support greater awareness and engagement on climate issues.

6 Recommendations for Jordan's institutional and governance arrangements for the LTS development

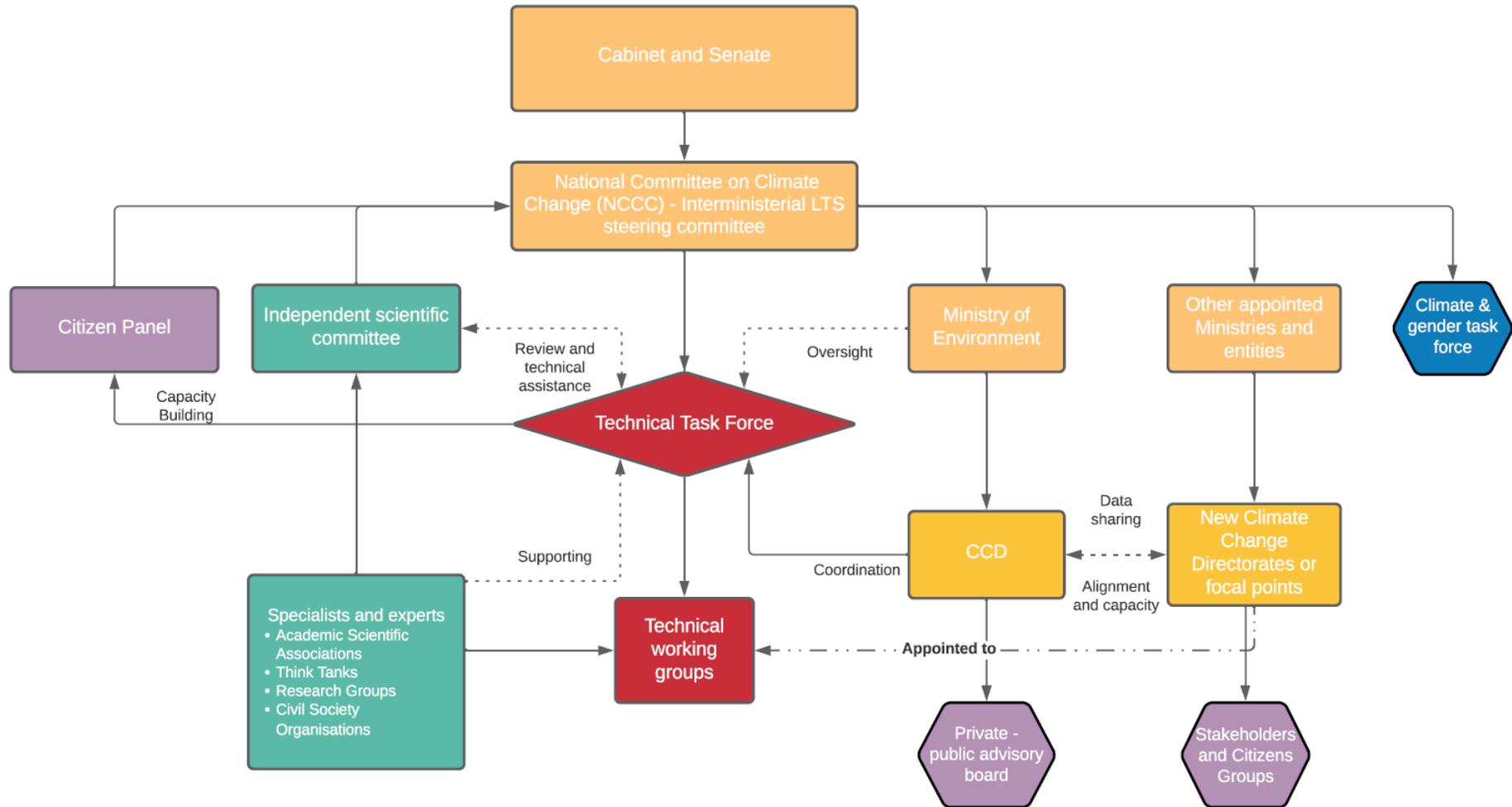
Jordan's LTS should serve as the overarching reference document on climate change across all ministries, guiding them towards emissions reductions in their particular sectors. The LTS should be used as a guidance document to align each sector to the decarbonisation objective and mainstream climate change response strategies. The Jordanian Government's key role is to set the framework for action across the economy. Beyond that, LTS has to be a shared endeavour between Government, local governance, business, civil society and the Jordanian people.

Reflecting on the existing structures, international good practices and current limitations, set out above, this section provides recommendations for Jordan's LTS governance and institutional structure.

6.1 Jordan's draft Institutional Arrangement

This proposed governance framework is based on existing climate change structures within Jordan and has pulled on good governance principles in addition to Ricardo's experience with other LTS development processes. This proposed framework includes the addition of new entities as well as how Jordan can enhance their existing structure. This section details who should be involved in the LTS process, what their role should be, and how they should participate. The proposed draft is also accompanied with a narrative to explain the rationale and a proposed flow diagram (Figure 6).

Figure 35 Jordan's proposed LTS institutional arrangement



Source: Developed by Ricardo Energy and Environment

Table 6-1 Proposed Institutional Arrangements

Role	Who	Responsibilities	How they should participate in the LTS
Parliament	House of Representatives & Senate	Can establish subcommittees to put climate planning on the policy agenda or to pass laws requiring long-term plans and to approve budgetary resources required for implementing the policies and plans.	Providing political mandate Engaged via Ministers
Inter-ministerial LTS Steering Committee	Integrated with the National Climate Change Committee members (16 ministries) (a sub-committee formed from this)	<ul style="list-style-type: none"> Maintains communication with policy makers/decision takers and government. Oversight and management of the LTS development process. Evaluates implementation of legislation and can propose essential new climate change legislation e.g. propose LTS climate change legislation on the basis of national priorities and international obligations Responsible for the update of the LTS and alignment to other climate strategies and reports e.g. NDC Post-development of the LTS, provides the enabling environment for priority actions. Acts as executing body for projects and programmes. Provides support and advice to the projects. Approves co-financing to projects and programmes. Approves sectoral actions plans 	<ul style="list-style-type: none"> Oversee the LTS process via regular meetings Approve stakeholders and experts to participate – e.g. form technical teams from governmental and non-governmental agencies, nominated according to specific needs Provide the mandate and approvals necessary for developing and approving the LTS Ensure alignment with existing country plans and strategies e.g. adopting LTS principles and goals in sector strategies
Technical task force	<p>A technical public body or group that provides substantial technical inputs and coordination of the LTS.</p> <p>A designated unit within the Ministry of Environment or operate as an external institution but managed by the MoE.</p> <p>Individual members are appointed for a minimum of 3 years</p>	<ul style="list-style-type: none"> The 'technical lead' tasked with the development, and ongoing monitoring of implementation and future updating Engage with representatives of all ministries via ministry CCDs (see below) Coordinate the mitigation and adaption emission pathways as part of the LTS and submit these to the committee for approval Approve the results of national studies and research into climate change and include these in the LTS Approve action plans and sectoral mitigation and adaptation programmes to ensure integrated action with stakeholders Ensure linkages with the NDC and national climate policy Coordinates municipalities, governorate councils and local councils to align climate change mitigation and adaptation concepts and measures between the LTS and local development plans (via focal points at the Ministry of Municipal Affairs) <p>Option: Could also incorporate the independent scientific panel/committee if operating as an external institution in order to maximise skills and capacity in country</p>	<ul style="list-style-type: none"> Day-to-day management and coordination of all LTS work streams Call upon relevant technical experts to support activities and form technical working groups as needed to inform decision-making. Coordinate and manage the inputs of the technical working groups Compile and update LTS documentation Provide briefings and progress reports to the scientific committee and steering committee and attend meetings to report on progress Coordination of stakeholder inputs Provide progress updates to CCD for monitoring and reporting

<p>Chair and coordinator of the technical task force</p>	<p>Ministry of Environment, Climate Change Directorate</p>	<ul style="list-style-type: none"> • The institutional hub for coordinating all climate change activities in Jordan in relation to the UNFCCC. • Responsible for reaching out to stakeholders to develop actions for climate response and to incorporate the resulting policies into executive decision-making. • Identifying the outline of the existing institutional framework for mitigation and adaptation measures. • Coordinating and supporting climate change mainstreaming in sectoral action plans. • Coordinate with stakeholders to elaborate a national climate finance plan for the LTS, identifying priority projects, programmes, and plans. • Create and manage a national database to document emissions data, mitigation and adaptation measures and climate finance data 	<ul style="list-style-type: none"> • Represent the Technical Task force to the LTS steering committee and other relevant climate committees and activities • Coordinate the work plan of the Technical task force • Coordinate with stakeholders • Provide technical support to other ministry climate change directorate/focal points • Lead on monitoring and reporting
<p>Technical Working Groups</p>	<p>Members of Ministry CCDs and other expert organisations</p>	<ul style="list-style-type: none"> • Groups of government and non-government experts formed to provide technical inputs on elements of the LTS including <ul style="list-style-type: none"> ○ Analysing of the potential national response measures to abate the increase in GHG emissions. ○ Identifying the key sources of GHG emissions and the projected future development of emissions from each source ○ Assessing climate risks and vulnerabilities ○ Sector action plans / mainstreaming climate ○ Local government climate action • Advisory groups on e.g. stakeholder and citizen engagement, women and vulnerable groups etc • Provide the linkage to other technical work areas in Jordan such as the GHG inventory and BUR reporting etc 	<ul style="list-style-type: none"> • Appointed to working groups based on the relevance of their skills and the topic • Provide knowledge and skills to support analytical work, research and policy recommendations • Appointed for a minimum period of 3 years
<p>Citizen Panel</p>	<p>Representatives of Jordan's Civil Society</p>	<ul style="list-style-type: none"> • Two-way interaction between citizens and governments that gives citizens a stake in decision-making with the objective of improving the intermediate and final development outcomes of an intervention. • The citizen panel can play a key role in empowering citizens and giving them the agency to influence the decision-making process. • The citizen panel should be considered a Tier 1, high priority stakeholder group, and partners in the decision-making process with the government. In particular, if there is any decision they strongly disagree with, this should not go ahead. Their decisions can be fed directly to the LTS steering committee, who must be committed to demonstrating how the citizen panel's views have been taken into consideration. • The panel will inform decisions concerning all key elements of the LTS development including vision definition, climate strategy, adaptation, mitigation, consultation on the draft LTS.. The panel will be composed of a representative sample of Jordanian society, in terms (at least) of gender, 	<ul style="list-style-type: none"> • The citizen panel will feed into the National Committee on Climate Change (NCCC) – Interministerial LTS steering committee. The steering committee could embed an agreement between the citizen panel to ensure all feedback from the panel is taken into consideration and fed into future decisions. Additionally, the agreement could also outline that, if any feedback is not considered, the committee will need to provide a justification as why the citizen panel's input will not be feed into the decision-making process. • The technical task force can build capacity through training to ensure all the

		age, location, social class, race, religion, educational level, and possibly attitudes toward climate change.	<p>citizen panel is climate change literate and has the necessary knowledge in regard to Jordan's LTS to make informed decisions.</p> <ul style="list-style-type: none"> • Training could be provided by relevant experts such as academics, research institutes and the civil society organisation (CSO).
Climate and gender task force	<p>Gender focal points of relevant public entities, IMC, JNCW along with representatives of civil society organizations, donors and private sector</p> <p>The Ministry of Environment could invite the above-mentioned stakeholders to nominate gender focal points to form a gender taskforce.</p>	<ul style="list-style-type: none"> • This taskforce could be coordinated by RSS (or the JNCW) • Following the publication of the LTS the gender taskforce can be embedded in the institutional structure. This could ensure, for examples, there is tracking of gender responsiveness in the implementation of this LTS and provide gender and climate input for international reports such as NDCs and SDGs National Reports among others. • This taskforce could also take forwards other recommendations and actions relating to capacity building and technology and develop an annual work-plan for implementation of these recommendations. 	<ul style="list-style-type: none"> • Responsible for incorporating gender responsiveness in the development of the LTS (including ensuring it is embedded in the vision, climate pillars, actions and criteria for determining actions for example) • Regular meetings to ensure implementation of policies and sharing knowledge about relevant projects and opportunities • Feed into the National Committee on Climate Change (NCCC) – Interministerial LTS steering committee. The steering committee could embed an agreement between the citizen panel to ensure all feedback from the panel is taken into consideration and fed into future decisions.
Independent committee or scientific panel	<p>Drawn from across government and non-government bodies e.g. academia, research groups, think tanks, scientific associations.</p>	<ul style="list-style-type: none"> • Ensure the integrity of the strategy • Hold implementers to account • Ensuring it is fit for purpose and responds to the latest science 	<ul style="list-style-type: none"> • Provides quality assurance of the LTS • Objectively assess progress through e.g. annual performance reviews and reports • Provide recommendations to enhance or adjust actions or policies • Provide recommendations for future updates based on e.g. developments in climate science and technology

Private sector advisory board	Representatives of key industries and private sector groups	<ul style="list-style-type: none"> • Act as a hub for actors to share information in a multi-directional manner. • Flagging areas where the LTS may create barriers to business development and investment. • Develop new private-public partnerships, business development, and investment and financing opportunities in both mitigation and adaption. • Provide up to date information to the private sector on new initiatives, incentive and standards, simultaneously, sector leads can feedback to the board to influence the implementation of the LTS. 	<ul style="list-style-type: none"> • Minimum twice-yearly meetings to provide feedback to the LTS steering committee • Feedback via consultations during LTS development • Develop new private-public partnerships, business development, and investment and financing opportunities in both mitigation and adaption.
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Members of the technical task force and working groups	<p>16 CCDs, found in all 16 Ministries forming the National Climate Change Committee plus independent organisations including</p> <ul style="list-style-type: none"> • Meteorology Department • Royal Scientific Society • Royal Department for Environment Protection • Greater Amman Municipality • Aqaba Special Economic Zone • Jordan Environment Society • National Center for Agricultural Research and Extension • Department of Vehicle Licensing • Jordan Women National Council
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6.2 Summary of recommendations

The following recommendations are relative to Jordan's existing institutional arrangement. Not only do the following recommendations enhance governance structures, but Jordan's national stakeholders are familiar with these current arrangements, thereby, more likely to agree to a similar arrangement for the LTS development.

Area	Recommendations	Impact	Relevant organisation to drive this
Approvals	Secure commitment and approval for the LTS development and necessary resourcing and institutional set up from the Cabinet and Senate	High level political commitment raises the profile of the work and helps ensure it is given appropriate emphasis across government	NCCC Ministry of Environment
New functions	Build on the climate change bylaw and NCCC by incorporating the role of LTS steering committee, with clear terms of reference Provide clarity on the NCCC's role to review NDC and LTS every five years	Building on existing institutional arrangements reduces administrative burden and reinforces the potential role of the existing committee The NCCCC would be able to oversee coordination of LTS implementation, oversee monitoring of progress of implementation, and ensure action is taken to update the LTS when needed	NCCC
	Create a new body – the technical task force – that will lead the coordination of the LTS and appoint permanent staff to this institution This should be formed with and managed by the CCD This new body can also coordinate a gender and climate task force referred to further in Annex 7 (gender)	This will ensure there is continuity of staff and available technical expertise in country, retaining knowledge and able to build capacity across other institutions in the longer term Forming a separate unit would enhance visibility but it should remain under the mandate of the CCD.	NCCC, Ministry of Environment & CCD
	Appoint CCDs or specific climate change focal points within ministries, to be coordinated and supported through CCD and the Technical task force or institution	Dedicated staff in ministries will ensure resource to mainstream climate change, support capacity building across government, and enhance monitoring and reporting	NCCC and Ministries
	Establish an independent scientific body to oversee the quality assurance and monitoring of the LTS	A dedicated independent scientific body can provide impartial advice and hold the government to account on the development and implementation of the LTS	NCCC and Ministry of Environment
	Launch a citizen panel to establish an open line of communication between Jordan's steering committee and civil society.	A two-way interaction between citizens and governments will provide citizens a stake in decision-making within Jordan.	National Committee on Climate Change (NCCC) - Interministerial

			LTS steering committee
	<p>Gender focal points of relevant public entities, IMC, JNCW along with representatives of civil society organizations, donors and private sector to form a gender task force</p> <p>The Ministry of Environment could invite the above-mentioned stakeholders to nominate gender focal points to form a gender taskforce</p>	Ensures that the LTS development process and subsequent implementation is gender sensitive and maximises opportunities for gender equality, women's voices to be heard, and women's economic empowerment, and minimises potential harms from climate actions	Ministry of Environment to request nominations for focal persons
Roles and responsibilities	Highlight the role of different ministries and institutions in the area of climate change and the need for cooperation to fulfil Jordan's commitments	Clearly defined roles and responsibilities reduces the risk of duplicated efforts and overlap	Ministry of Environment
	Reconsider the current membership of the NCCC making sure that all relevant stakeholders are represented. This includes representatives of local communities, gender and vulnerable groups, and the private sector	Ensuring the NCCC is diverse and all voices are fed into the LTS	NCCC
	The NCCC could consider creating a sub-committee co-chaired by the ministry of finance and the ministry of energy (and/or transport) so that these ministries become accountable to deliver the LTS besides the ministry of environment.	Avoids the agenda being solely owned by the Ministry of Environment and promotes ownership	NCCC
	Ensure that there is representation from all entities (including those not 'typically' relevant) on both adaptation and mitigation issues	The LTS climate strategy should be an integrated response, and the vulnerability assessment in Annex 3 shows that adaptation will also be key for the Ministry of Industry, Trade and Supply and for the Ministry of Transport for instance. In addition, there needs to be a concern for potential maladaptation due to mitigation actions (and vice versa), which would benefit from broader participation.	NCCC
	Entities identified in Annex 2 of the bylaw (see appendix) need be reviewed to ensure that it incorporates all relevant technical organisations	Technical agencies and should be considered for roles in the technical task force or institution, and scientific steering committee	NCCC and CCD
	Entities identified in Annex 3 of the bylaw (see appendix) need to establish a robust methodology on data handling. Data sharing should be encouraged, and annual reports submitted	This will ensure that all data processes are consistent and transparent	Annex 3 entities
	Capacity and staffing	Invest in the focal points acting in the technical task force or institution (capacity building, time, and formation of dedicated roles), and technical working groups, and appoint them to	This will strengthen their work and it's highly recommended to prepare their successors in advance

	<p>their positions for a sufficient period of time (at least 3 years)</p> <p>Increase the number of the staff within the CCD and enhance their capacity to be able to carry out responsibilities in the long term. Ensure they are appointed for a minimum of three years.</p> <p>A comprehensive capacity building and technical assistance programme is needed to build knowledge and technical skills.</p>	<p>This will strengthen human resources within the CCD permitting the directorate to fulfil responsibilities as a focal point to the UNFCCC</p> <p>Enabling the role of MoE with the staff of CCD will be the cornerstone for establishing a compatible climate change system that would generate its own monitoring systems & reports, with capacity building transparency needs.</p>	<p>Ministry of Environment & CCD</p> <p>International partners</p>
	<p>Provide local governments with the necessary training resources to lead effective behaviour change campaigns, this could include capacity building workshops</p>	<p>In order for local governments to implement elements of the LTS, it is vital these entities have the required resources to take full ownership of mitigation (and adaptation) actions at the local level</p>	<p>Local Government & CCD</p>
	<p>Build capacity through education and training on the key LTS topics for the citizen panel and climate change and gender task force to ensure all are climate change literate and have the necessary knowledge in regard to Jordan's LTS to make informed decisions. They will also need to be facilitated through deliberative discussions, to voice opinions and reach decisions where necessary.</p>	<p>This will enable citizens of the panel to voice informed opinions regarding the development of the LTS and reach decisions where necessary regarding its design.</p> <p>Capacity building will also ensure that the climate change and gender task force can provide informed review and recommendations.</p>	<p>Technical Task Force</p>
Coordination	<p>Ministry of Environment to coordinate continuously with the CCD as the chair/coordinator of the new LTS technical task force, supporting them in identifying their capacity building needs</p>	<p>Increased transparency between the CCD and Ministry of Environment. Both entities would be in align and be working towards the shared vision</p>	<p>Ministry of Environment & CCD</p>
	<p>Establish an LTS monitoring and reporting system, with the technical task force or institution reporting to the CCD, who is mandated to provide progress reports to the NCCC as the LTS steering committee. Ministry CCDs should report progress on mainstreaming and implementation</p>	<p>Establishing a monitoring and progress reporting system and structure will improve accountability and mainstreaming and also highlight capacity needs and issues</p>	<p>CCD and Ministry CCDs</p>
	<p>Enhance private sector engagement by building on previous Article 6 and project implementation engagements.</p>	<p>It would give an additional value to include the private sector but requires the identification of private sector entities and a willingness from their side to participate.</p>	<p>CCD and ministries</p>

Good Governance Principles

Alongside recommendations regarding Jordan's institutional structure. The following recommendations have been included to ensure Jordan practices good governance throughout the LTS process.

High political leadership

- High-level leadership will likely be needed at some point in the development and/or implementation of Jordan's LTS. It is advised to seek high-level support to endorse the LTS from the outset, such as from the Cabinet or Senate. This can help to support all subsequent steps, including but not limited to initiating the process, advancing and guiding development, communicating advocacy efforts, stimulating review, and driving implementation.

Legal Framework

- To further enshrine governance, it is recommended Jordan considers introducing a Climate Change law to provide a legally binding foundation to manage climate risks and drive Jordan's transition to a low carbon, climate-resilient country.
 - The Climate Change Act would strengthen the mandate of the bodies mentioned above and also ensure the principles of inter-ministerial cooperation and reporting on climate action.
 - The act could also set out requirements at a local level, such as setting up municipality forums. The Forums will be responsible for coordinating climate change response actions and reporting in their jurisdictions (which are updated every five years).
 - Additionally, the Act could set out requirements for private sector engagement and data collection, management, and sharing for climate action and reporting.

Stakeholder and Public Engagement

- Early opportunities to engage with Jordan's municipalities, communities, interest groups, and the public at large can generate greater awareness and potentially create buy-in from constituencies that support the long-term plan's implementation. This should be an iterative process throughout the LTS.
- Develop a multidirectional flow of information among national and subnational governments, communities, affected groups, and industries to understand priorities, build awareness of the planning process, and sharpen understanding of equity and fairness concerns.
- Identify vulnerable groups who will be most significantly affected by the long-term strategy, such as those tied to a fossil fuel economy. Involve these vulnerable groups throughout the strategy's development.
- It is recommended to involve a wide range of actors in scenario building (business, industry bodies, civil society, labour, academia, local governments, and government agencies). Additionally, to set up a transparent stakeholder consultation process such as National stakeholder consultation workshops to invite feedback on the LTS from a wide range of stakeholders, this could also include randomly selected citizens.

Annex 6 – Citizen Engagement

1 Role of citizen engagement in developing an LTS

Jordan is a middle income and developing country which is highly dependent on energy. More than 70 percent of Jordan's population live in towns and cities; causing negative climate impacts. Added to that, Jordan ranks as the third country in the world in water resources scarcity. Climate change is adding substantially to this problem causing high pressures to food security and sustainable livelihoods. Climate change affects everyone, everywhere, but developing countries including Jordan are most vulnerable to it where Jordan is more of a recipient of climate change impacts rather than a contributor (Jordan contributes about 0.02% of the world effects). This adds substantially to existing suffering.

The impacts of natural hazards and climate change, and solutions, are mostly local, therefore climate strategies must engage those most affected. It is clear that civil communities should set their own priorities and are best responsive to their needs. Based on that, engaging citizens in a meaningful way can make use of local knowledge and expertise for a more effective outcome. Jordan has a diverse and active civil society. Many civic and charity groups and associations representing various interests exist and operate in the country. Many of them largely operate in certain areas of the country are related to the tribal framework in Jordan. Their work revolves round lobbying for increasing the allocation of national resources to their locality. Many Civil Society Organisations (CSOs) actively participate in national dialogues on political and socio-economic issues.

Public engagement is justified by underlining that citizens of any country including Jordan should be empowered in decision-making processes resulting in better quality actions, citizens' consent and trust, and more positive public attitudes and behaviours. On one hand, public participation can play an important role in actions to achieve climate goals. However, on the other hand, to achieve the desired effects, engagement needs to be carried out in a way that is meaningful for both the citizens and the governmental institutions involved. Citizen involvement is relevant at all stages of the policy cycle: at initiation of the long term strategy; while the strategy is being drafted (before & during LTS development where the rationale is that there is the need for citizen inputs to shape the strategy), after LTS finalization and publication where the need exists for citizens to be aware of the final strategy, and implementation where citizens must be involved in the implementing of the plans. Added to that, citizens must be involved in monitoring, evaluation, and eventually revising the strategy.

Despite renewed attention in recent years, the call for civil engagement in climate action is not new. From the Rio Declaration in 1992 to the 2015 Paris Agreement, it gives citizens of each country a large share in climate change related decisions and actions. Action for Climate Empowerment (ACE) denotes work under Article 6 of the United Nations Framework Convention on Climate Change (UNFCCC, 1992) and Article 12 of the Paris Agreement (2015) and their six elements: Climate Change Education, Training, Public Awareness, and Public Access to Information, Public Participation, and International Cooperation on these issues. This will result in increased and better community support for climate mitigation measures. It produces new insights based on local knowledge and expertise as well as inducing social learning. Moreover, it has been determined that effective and meaningful participation is crucial to ensuring that policies are designed in a socially just manner.

Lastly, since poor awareness of climate change issues amongst citizens and stakeholders is one of the obstacles for inclusive and effective citizen engagement (and actions) on this issue, public education on climate change should be considered as a key area that needs improvement. Education can be a key factor in promoting sustainable development, by helping people develop knowledge, skills, values and behaviours which enhance their understanding and appreciation of how sustainability means a better life for them and their communities.

2 International examples

2.1 Framing of citizen engagement

Notwithstanding the need for public empowerment in climate action, it is not always clear how this can happen best in different country contexts. In 2014, the World Bank Group produced the *Strategic*

*Framework for Mainstreaming Citizen Engagement in World Bank Group Operations*³⁴³ to adopt a coherent and holistic approach to operationalize citizen engagement (CE) in World Bank-supported policies, programs, projects, and advisory services and analytics to contribute to sustainable processes for CE with governments and the private sector. This guidance is helpful in framing citizen engagement and identifying opportunities and methods of support.

“The World Bank defines citizen engagement as the two-way interaction between citizens and governments that gives citizens a stake in decision-making with the objective of improving the intermediate and final development outcomes of an intervention.”

Citizens are understood as the ultimate client of government, development institutions’, and private sector interventions in a country. Citizens can act as individuals or organize themselves in associations and groups such as community-based groups, women’s groups, or indigenous peoples’ groups. Civil society organizations (CSOs) can represent citizens and can include organizations outside the public or for-profit sector, such as nongovernmental organizations (NGOs), charitable organizations, faith-based organizations, foundations, academia, associations, policy development and research institutes, trade unions, and social movements. In this context, the term citizen is not used in a legal sense but is understood in the broad sense of referring to all people in a society or country in an inclusive and non-discriminatory way.

This Strategic Framework for Citizen Engagement identifies a spectrum of citizen engagement which includes consultations, collaboration, and empowerment (see Figure 8-1). While informing citizens (Level 1 in the figure) is an important enabling condition, meaningful citizen engagement requires a two-way interaction to close the feedback loop and meet citizens’ expectations for improved development outcomes based on their inputs.

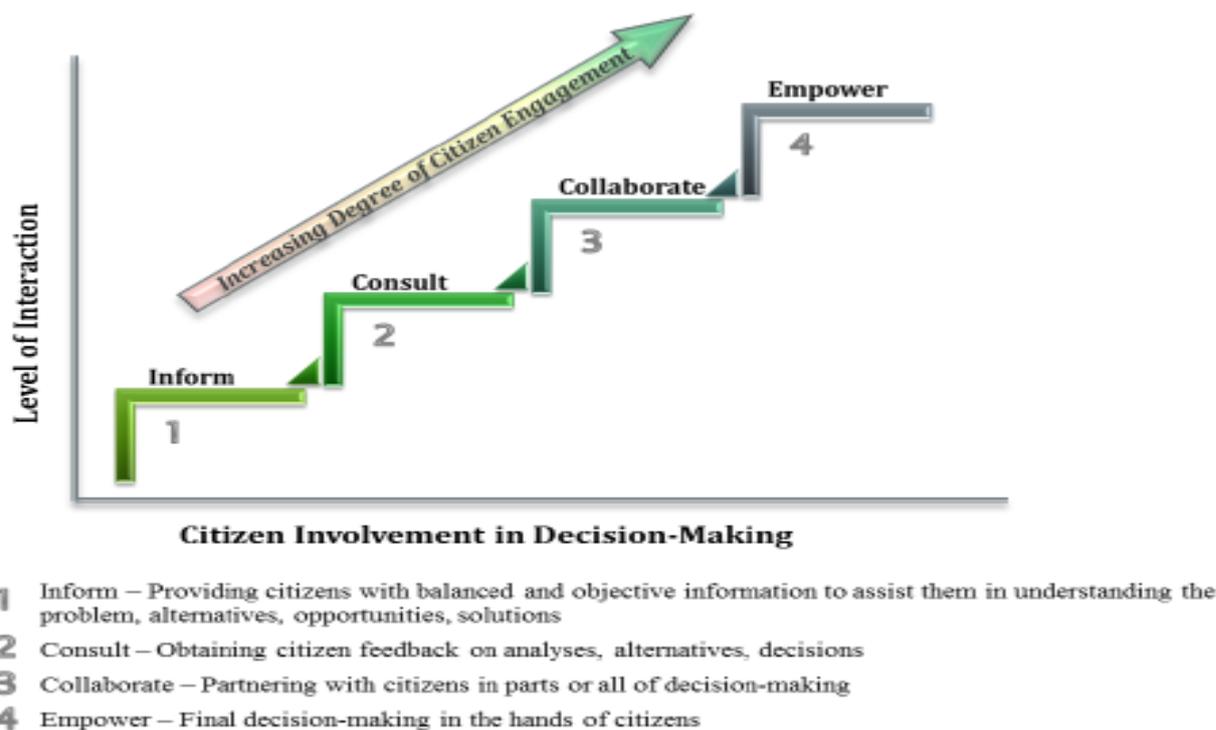


Figure 2-1: Dimensions of Citizen Engagement

Source: World Bank (2014)³⁴⁴

³⁴³World Bank Group (2014), Strategic Framework for Mainstreaming Citizen Engagement in World Bank Group Operations <https://openknowledge.worldbank.org/handle/10986/21113>

³⁴⁴World Bank Group (2014), Strategic Framework for Mainstreaming Citizen Engagement in World Bank Group Operations <https://openknowledge.worldbank.org/handle/10986/21113>

These dimensions must be integrated into a Citizen Engagement Action Plan that is focused on increasing the level of citizen involvement in decision making related to climate change, risk, and adaptation strategies and plans.

2.2 Citizen engagement in existing LTS and climate policy development

Countries have undertaken citizen engagement in their LTSs very differently. Some examples are summarised below. Note that in many cases, citizen engagement has significant overlap with 'stakeholder engagement' in these processes.

To date, there are few examples of LTSs that have been substantially created via bottom-up citizen engagement processes; the majority of examples focus on consulting on outcomes only.

Table 2-1: Examples of citizen engagement in LTSs^{345, 346}

Country / LTS	Citizen and stakeholder engagement process
Singapore	During the LTS development process, inputs and feedback from relevant government agencies, academia, industry and civil society were collected through technology roadmaps, surveys, the public consultation on Singapore's long-term low-emissions development strategy and various stakeholder engagements.
Fiji	The CCICD convened three National Stakeholder Workshops with key national and sub-national government, non-governmental, academic, and private sector stakeholders to inform them about the LEDS process and progress, and to solicit feedback to incorporate into the LEDS itself. The three workshops addressed: the development of Fiji's 2050 vision for low emission development, both economy-wide and for each sector; scenario development in each sector, including business-as-usual (BAU), high ambition, and very high ambition mitigation scenarios; and validation of findings for each sector.
Costa Rica	Non-governmental actors were consulted in the process of developing the long-term strategy. These included NGOs, the private sector (including industry chambers, agriculture and livestock groups, car importers, bus companies, truck owners' association, companies, sustainability initiatives, and utilities), representatives from municipalities, and academia.
South Africa	In South Africa, business, industry bodies, civil society, labour, academia, local governments, and government agencies were involved in the scenario-building team. In addition, there were several high-level round tables for government (including the directors general of various government departments), civil society (including a dozen major NGOs, research, faith-based, and civic organizations), labour, and business. These round tables were aimed at communicating the LTMS results across the country's leadership. Education is also emphasised as a core part of public awareness on climate change.
Germany	Representatives of states, local authorities, and associations (including trade unions and businesses) proposed measures. Scientific institutions helped to refine the proposed measures, and the Institute for Applied Ecology conducted impact assessments on the measures. In addition, about 500 members of the public, randomly selected, were included in citizens' conferences that took place in five different cities. An online dialogue was open to everyone. Stakeholder groups also met in five thematic working groups. The participation process was designed by organizations that specialized in participation and process design, and the process itself was evaluated using analysis and interviews with participants

³⁴⁵ WRI (2019), 'Good governance for long-term low-emissions development strategies', <https://www.wri.org/publication/good-governance-long-term-low-emissions-development-strategies>

³⁴⁶ LTSs – available here: <https://unfccc.int/process/the-paris-agreement/long-term-strategies>

Mexico	There was no stakeholder engagement for the Mid-Century Strategy, but there was a public consultation process with NGOs and broader society for the Mexican National Strategy, which informed the Mid-Century Strategy.
USA	Due to the compressed timeline of developing the long-term strategy, the United States was unable to allow time for a formal notice and comment period, relying instead on structured discussions with the private and non-profit sectors, respectively, in a few meetings. Those consulted included companies and NGOs that had been engaged with the administration over the prior 7 years of the administration.
France	<p>In France, a consultative process for the preparation of the 2015 Transition Law created an ad hoc Council for the Energy Transition (CNTE), which was later institutionalized by law. This council included representatives from business, NGOs (environmental, social, and consumer organizations), trade unions, subnational authorities, and members of the National Assembly and Senate. A plenary of more than 130 representatives was created, which met monthly. In addition, the CNTE had a consultative body of 50 people with an equal share of representation of six constituencies: businesses, trade unions, environmental NGOs, caritative and consumer NGOs, local authorities (elected representatives), and members of parliament. Independent experts supported the plenary and working groups. The stakeholder consultation and national debate was not organized by the Minister, but an independent steering committee with five members of business, academia, and civil society. A citizens group was brought together to provide advice on the organization of the stakeholder process, the prioritization of issues discussed, and the review of public documents. The resulting law, adopted in 2015, mandates that a long-term strategy has to be prepared and revised every five years, in a consultative process with the CNTE.</p> <p>Education is emphasised as a core part of public awareness on climate change. The LTS for France also highlights the importance of young people of participating in low carbon activities, as eco-delegates, elected high school students, civic service, universal national service, youth movements, student associations.</p>
Czech Republic	In developing the long-term strategy, a wide range of stakeholders was consulted. These stakeholders included business interest groups (e.g., the Confederation of Industry of the Czech Republic, the Czech Chamber of Commerce), local governments (Local Government Association), labour groups (The Bohemian-Moravian Confederation of Trade Unions, Association of Independent Trade Unions), central government entities (Czech Statistical Office, Czech Mining Office, etc.), environmental NGOs, and others, such as the Czech Academy of Sciences. These stakeholders commented on the final draft; some were consulted during the drafting process.

2.3 Citizen engagement approaches utilised

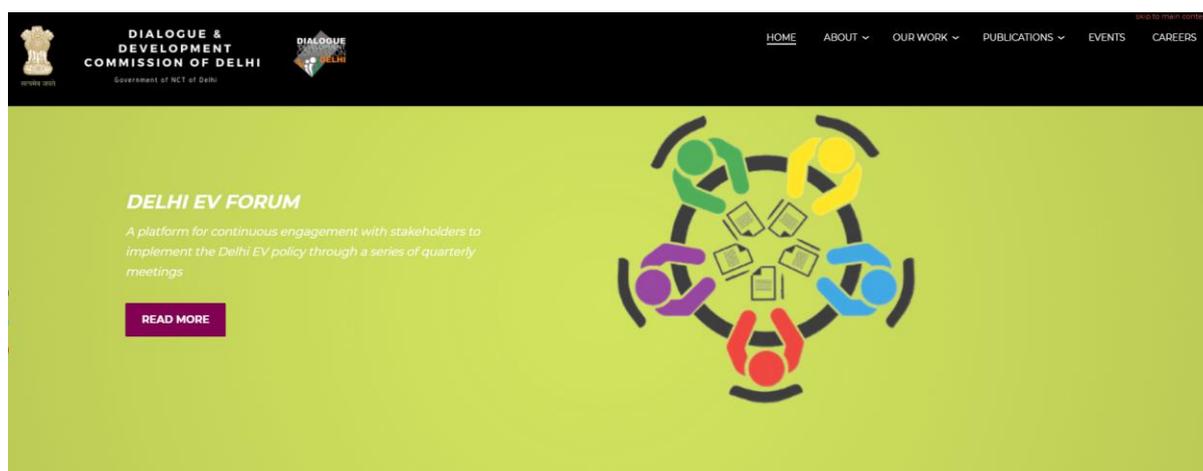
This section contains some examples of citizen and stakeholder engagement approaches that have been utilised for consulting on LTSs or related strategies/policies.

2.3.1 Public and stakeholder consultation

Public consultation and participatory processes can play a key role in empowering citizens and giving them the agency to influence the decision-making process. This is clearly evident in projects such as Järva Dialog (in Sweden) where resistance to an urban regeneration project led to the creation of an inclusive and reiterative process of participatory decision-making. By the end of the project, residents

(in particular migrant women) who were previously absent in any local dialogue, felt empowered to actively participate in the local decision-making process, both within the project and beyond³⁴⁷.

Such public consultation can allow the participation of large numbers of citizens – the ‘Delhi Dialogue’, for example, managed to engage 6 million people online and a further 8 million people offline through the use of volunteers, media and digital media³⁴⁸. The ‘Delhi Dialogue’ was established by the Government of Delhi (India) to crowdsource Delhi’s problems and solutions, and ended up identifying a set of political priorities and actions which reflected the views of people from a wide range of backgrounds. Over a period of 6 months (in 2014-2015), technical experts, not-for-profit organisations, community organisations and academics were all engaged in discussions³⁴⁹. Around 80 focus group discussions were conducted, with over 350 experts covering 21 policy areas, focused on citizen consultation, governance solutions and public awareness. The dialogues were wide-reaching and engaged numerous different demographics (e.g. youth, women, and senior citizens of varying economic status) and sectors (e.g. water, energy, health and education)³⁵⁰.



FOSTERING COLLABORATION

The Dialogue and Development Commission (DDC) is a premier think-tank of the Government of NCT of Delhi and advises the government in finding sustainable, people-centric solutions to the critical development challenges facing Delhi.

Figure 2-2: Delhi Dialogue and Development Commission website

Source: *Delhi Dialogue and Development Commission*³⁵¹

Lisbon’s “green participatory budget” (the first of its kind) provides an excellent example of allocating and distributing public resources according to the opinions of citizens, in the context of climate change adaptation and mitigation projects. All projects (e.g. cycling lanes, tree planting for reduction of heat stress etc) have to be chosen by local residents through a participatory budgeting programme, which aims to involve citizens in local governance and decision making. The impact of this approach is expected to be two-fold, firstly ensuring constant annual investments into the city’s low-carbon

³⁴⁷ Climate KIC, Five ways of meaningfully involving citizens in climate action, <https://www.climate-kic.org/opinion/five-ways-of-meaningfully-involving-citizens-in-climate-action/>

³⁴⁸C40 (2020), Good climate governance in practice. Mainstreaming climate action: case studies from leading cities, https://cdn.locomotive.works/sites/5ab410c8a2f42204838f797e/content_entry5ab410fb74c4833febe6c81a/5f7f892bb2744600adb12d18/files/C40_CaseStudies_new_v0.10.pdf?1613736426

³⁴⁹C40 (2020), Good climate governance in practice. Mainstreaming climate action: case studies from leading cities, https://cdn.locomotive.works/sites/5ab410c8a2f42204838f797e/content_entry5ab410fb74c4833febe6c81a/5f7f892bb2744600adb12d18/files/C40_CaseStudies_new_v0.10.pdf?1613736426

³⁵⁰*ibid.*

³⁵¹ <https://ddc.delhi.gov.in/>

transition, and also raising awareness amongst citizens of the benefits of climate change mitigation and adaptation in a way that relates to their needs³⁵².

2.3.2 Education

Targeting the education system can also provide a way of bringing climate discourse to large proportions of the population, as evidenced by Rio de Janeiro's (Brazil) engagement with schools. An engagement programme was designed to help teachers in Rio's public schools share sustainability concepts and actions with children, with the hope that they would in-turn share them with their parents and families. It was estimated that this approach would allow engagement of about 10% of the city's population, excluding further distribution of this knowledge by these children to their families at home. The Sustainable Development Programme even had a mascot to enhance this engagement and help build brand identity: suggested names for this mascot were submitted by students through a competition among schools, and also through on-line voting at the portal PARTICIPA.RIO³⁵³.

Chile's Climate Change Education and Awareness Program that includes a Teacher's Guide on climate change, the "La Plaza Imaginaria" animated series, and the Citizen carbon footprint calculator.

Significant work is also underway globally to promote education surrounding climate change and sustainable development, such as through UNESCO'S Education for Sustainable Development' program that could potentially be reflected in primary and secondary school curricula.

2.3.3 Citizen Assemblies

Deliberative events, such as citizen assemblies, can demonstrate the active role citizens can play in decision making and developing a consensus-based approach to dealing with difficult policy issues, such as climate change³⁵⁴.

The UK Climate Assembly, for example, brought together over one hundred citizens to discuss how the UK should reach net-zero GHG emissions by 2050. The assembly members met over six weekends in the spring of 2020 and learnt about the choices the UK faces before discussed them and making their own recommendations about what the UK should do to reach their climate goals³⁵⁵. The members of the Assembly ultimately recommended that the UK's path to net-zero should be "underpinned by education, choice, fairness and political consensus"³⁵⁶.

This kind of extensive public dialogue can give people the chance to reflect on what climate change means in their own terms and engage with the decision-making process. Furthermore, citizen assemblies can also help bridge the gap between experts and citizens, and enhance public understanding of climate change and the issues we face as a result.³⁵⁷

2.3.4 Neighbourhood Parliaments

Neighbourhood Parliaments [originated in India](#), where over the last thirty years they have developed 400,000 local mutual aid groups under the Neighbourhood Parliament banner. Approximately half of those groups are now using Sociocracy, a form of consent-based governance which has spread around the world as a global standard for governance in which every participant has a real voice. In sociocratic Neighbourhood Parliaments, every household in a neighbourhood of 20 - 30 homes contributes a representative. Every representative has a ministerial role in their Neighbourhood Parliament, and together they work on the projects they decide are most important for their neighbourhood, using the organising focus of the UN 2030 Sustainable Development Goals. These Neighbourhood Parliaments then connect to one another, forming village, district, and state parliaments made up of representatives

³⁵² Climate KIC, Five ways of meaningfully involving citizens in climate action, <https://www.climate-kic.org/opinion/five-ways-of-meaningfully-involving-citizens-in-climate-action/>

³⁵³ C40 (2020), Good climate governance in practice. Mainstreaming climate action: case studies from leading cities, https://cdn.locomotive.works/sites/5ab410c8a2f42204838f797e/content_entry5ab410fb74c4833febe6c81a/5f7f892bb2744600adb12d18/files/C40_CaseStudies_new_v0.10.pdf?1613736426

³⁵⁴ <https://www.climate-kic.org/opinion/five-ways-of-meaningfully-involving-citizens-in-climate-action/>

³⁵⁵ <https://www.climateassembly.uk/>

³⁵⁶ <https://www.climateassembly.uk/>

³⁵⁷ <https://www.climate-kic.org/opinion/five-ways-of-meaningfully-involving-citizens-in-climate-action/>

elected upward. Where Neighbourhood Parliaments are widespread, local politics transform, with a majority of women elected to office and a reduction of corruption. In times of disaster, relief aid is distributed more equitably, because people in the villages have a say and food or construction materials cannot easily be diverted for private profit.³⁵⁸ Regarding climate change, these parliaments are making meaningful local impact, with environmental campaigns encouraging low carbon behaviour change and devising innovative means of adapting to changing climates. Some local governments in the south of India now have specific programmes to support the creation of neighbourhood parliaments in every neighbourhood, given the significant positive impact they have on poverty reduction, mental and physical wellbeing, and climate change mitigation and adaptation

2.3.5 Interactive platforms

Interactive online platforms can make climate change knowledge accessible to all and provide an effective way of engaging large numbers of citizens in the discourse surrounding climate change.

HackAIR, for example, is an open platform that was co-created together with citizens to foster democratic participation in the measurement and understanding of air quality, ultimately aiming to raise collective awareness on the topic through local dialogue³⁵⁹. In doing so, participants reported a change in their individual behaviours (based on improved knowledge on air pollution) and also an increased confidence in their own voice. This is a type of “citizen science”, which has been found to offer more than a ‘simple learning’ benefit by fostering a sense of empowerment to participate in informed decision-making, especially for disadvantaged communities³⁶⁰.

³⁵⁸ <https://www.thealternative.org.uk/dailyalternative/2020/4/26/neighborocracy>

³⁵⁹ <https://www.climate-kic.org/opinion/five-ways-of-meaningfully-involving-citizens-in-climate-action/>

³⁶⁰ <https://www.climate-kic.org/opinion/five-ways-of-meaningfully-involving-citizens-in-climate-action/>

Another example of this is the “Future Bristol Low Carbon 2050” platform³⁶¹, which is an online platform designed to allow citizens of Bristol (UK) to explore in depth two different scenarios to achieve the cities’ climate goals. This platform has a simple, user-friendly interface, designed to ensure the information contained is accessible and interactive. Such platforms make climate change knowledge accessible to the wider public and allow citizens to build an understanding of how climate policy may impact their everyday lives.



Figure 2-3: Future Bristol public engagement website

Source: Future Bristol³⁶²

Competitions and activities aimed at engaging the public can also be an innovative and interactive way of bringing the climate change discourse to the wider community. Earth Hacks, for example, aim to “harness the power of hackathons to develop student-driven solutions to the climate crisis”³⁶³. They define environmental hackathons as “*fun innovating competitions, where students compete against their friends to design and develop technical solutions to our world’s pressing climate issues. A hackathon solution could be but is not limited to: software code, an engineering design, a public policy, a business plan, a community model, an art piece, or a website*”³⁶⁴. Such an approach to citizen engagement can provide useful insights from a large pool of citizens, and potentially lead to new, original ideas for tackling to the climate crisis.

³⁶¹ <http://www.futurebristol.co.uk/scenarioux/>

³⁶² <http://www.futurebristol.co.uk/scenarioux/>

³⁶³ <https://earthhacks.io/>

³⁶⁴ <https://earthhacks.io/>

Interactive online platforms also provide an opportunity to engage citizens in the LTS modelling process. In the UK, for example, the Department for Business, Energy and Industrial Strategy (BEIS) produced an interactive “My 2050 Calculator”³⁶⁵, where users can easily explore pathways to a low carbon UK by 2050 by adjusting the level of ambition of numerous sectors to produce their own pathway (essentially, a simple, user-friendly representation of the 2050 Calculator model).



Figure 2-4: BEIS (UK) 'My2050 Calculator' website

Source: BEIS (no date)³⁶⁶

3 Experience of citizen engagement in Jordan

Within Jordan, citizen engagement experiences, particularly in donor supported projects, have usually focused around providing information and undertaking consultations (levels 1 and 2 in Figure 1). It is usually practiced in Jordan as part of a general stakeholder engagement heading. It basically includes major stakeholders from Government authorities, major NGOs; but little representation of the local community. For example, the Environmental and Social Impact Assessments (ESIA), requested by the Ministry of Environment for all kinds of projects, public scoping sessions were conducted in the Capital Amman far from intended projects. The Ministry of Environment would make the invitation list and invite them to attend. Local public invitations were limited to governmental authorities of the locality and may be local NGOs. More recently things are changing were these sessions are many

³⁶⁵ <https://my2050.beis.gov.uk/?levers=1111111111111111>

³⁶⁶ BEIS (no date) My 2050 Calculator, <https://my2050.beis.gov.uk/?levers=1111111111111111>

times conducted on relevant locality of the project and open basically to the local citizens. Other times, surveys are conducted on local levels to engage CSOs and local citizens.

3.1 Requirements for citizen engagement in existing strategies

The next table identifies key strategies in Jordan and includes their stakeholder and citizen inclusion and engagement requirements.

Table 3-1: Examples of requirements for citizen and stakeholder engagement within existing policies

Document	Description
Jordan 2025 Vision	<p>“Jordan 2025” vision requires citizens, whether in public or private sector, to adhere to the implementation and the general principles, supported by faith in the rule of law and the importance of setting high standards of excellence. It puts the Jordanian citizen at the center of the development process within the country.</p> <p>The Government’s “Jordan National Vision and Strategy 2025” includes the following priorities:</p> <ul style="list-style-type: none"> • Active citizens with a sense of belonging – through adequate health services and education that equips all citizens with the skills needed for decent and rewarding employment opportunities. • Safe and stable society – by ensuring that all citizens have confidence in, and comply with, the law and feel protected in a safe and strong society with a desire to be active members in their communities.
Jordan’s Way To Sustainable Development First National Voluntary Review On The Implementation Of The 2030 Agenda	The Ministry of Planning and International Cooperation prepared a stakeholder engagement strategy to ensure the widest participation from all Major Groups & Organizations (MGOs) in the SDG implementation and VNR preparation.
Green Growth National Plans 2021-2025 – Agriculture sector	<p>The overall objective of the strategy is to develop a national green growth strategy, with supporting action plans that enhance existing data deficiencies, action-plan recommendations, stakeholder engagement, and sharing of expertise.</p> <p>The strategy identifies the stakeholders to include governmental stakeholders, NGOs and private sector.</p>
Green Growth National Plan 2021-2025 – Energy sector	
Green Growth National Plan 2021-2025 – Transport sector	
Green Growth National Plan 2021-2025 – Water sector	
Jordan Long-term Transport Strategy	Jordan Long Term Transport Strategy is built based on 8-pillars, of which "Have citizens at the core of the transport policy", the key is promoting a greater inclusion and participation of citizens in the decision making”
National Water Strategy (2016-2025)	<p>Stakeholder engagement: MWI and its agencies will be prepared to engage with stakeholders in the water sector, as this Strategy focused on IWRM which calls for a renewed effort to engage with stakeholders.</p> <p>The strategy defines the stakeholders to include the user groups and associations, the service providers, public corporations and private</p>

	<p>sector companies to regulatory and enforcement bodies, the private sector, local authorities, farmers' groups, civil society institutions, NGOs and community-based organizations.</p>
<p>National Strategy and Action Plan for Sustainable Consumption and Production in Jordan (2016-2025)</p>	<p>One of the strategic objectives of the national SCP is to “Engage key national stakeholders in developing, practicing, and evaluating Sustainable Consumption and Production models and circular economy measures leading to high resource efficiency and preservation, reduced pollution, and decoupling the economic development process from environmental degradation and promoting sustainable lifestyles.” These key stakeholders include policy-makers from all relevant ministries who set the regulatory institutional framework; National and local administrations (municipalities and Joint Services Council in the case of waste management SCP plan) in charge of insuring the implementation of the strategies and making the necessary adaptations; Private sector, including local small, medium and big enterprises, multinationals, entrepreneurs, manufacturers, producers, retailers and sellers, for they are responsible for the production processes and bringing products and services to market, and hence are in a unique position to advance SCP in the region; Civil Society, including unions, NGOs and the Federation of Environmental NGOs, citizen-led initiatives, social economy associations, consumer groups for their key role in mainstreaming sustainable consumption and production habits and ensuring different stakeholders meet their commitments; Schools, Universities, Academic and Research Institutions who have a major role in educating on the SCP at all levels and in driving innovation in sustainable processes, products and services; the Central Bank of Jordan, financial institutions, the Jordan Bank Association, international finance institutions including EBRD, EIB, AFD etc. and the JREEEF and the Environmental fund, the Global climate Change Fund all of whom provide the financial means and services are essential in driving the shift to SCP as well as the tax and customs department for providing the necessary fiscal incentives; and Regional and international organizations for their role in committing and bringing support technical and financial support to the different stakeholders, through the exchange of information and knowledge and building the capacities of all the above mentioned stakeholders, enabling them to carry out their role in the shift to SCP.</p>
<p>National Solid Waste Management Strategy (2015-2034).</p>	<p>A public awareness and education policy was defined to complement the MSW management national strategy in the long-term, with focus on innovative community engagement programs. In this framework, public education campaigns using the media, advertisements, brochures, stickers, events, workshops and innovative communication methods were defined that can contribute to the best way to the efforts to decrease the burden of MSW in Jordan. Different type of public awareness and education policy was proposed for different target groups, depending on the expected outcome in order to bring the best possible results.</p> <p>Within the national strategy, a public awareness and education programme is recommended to be implemented over four phases: Zero Phase: Audience Research (short-term period); Phase I: Design Phase (short-term period); Phase II: Implementation Phase (mid-term period); Phase III: Nationwide Phase (long-term period). The first two phases will be implemented during the course of this action. During the zero phase, a National Audience Research is recommended to be conducted for a better understanding of current knowledge, attitudes and practices of key audiences, as well as pinpoint obstacles and barriers that need to be reduced and incentives that need to be provided in order for them to adopt positive MSW management</p>

	<p>behaviours. Potential issues will be littering, hygiene in public spaces, payment of fees, material segregation and recovery, behaviours regarding special and hazardous streams. The objective of Phase I (3 years) is to design a comprehensive public awareness and education programme. It will be done using participatory approaches that stress broad-based involvement from all sectors of Jordanian society, thus ensuring local buy-in, support, and participation during the implementation. Based on the design, a set of pilot projects are recommended to be implemented at small-scale (villages, neighbourhoods).</p>
<p>National Energy Strategy (2015-2025).</p>	<p>The Strategy stipulated that:</p> <p>The Private sector is the main developer of energy sources, where all generation and distribution facilities for electricity are commercialized.</p> <ul style="list-style-type: none"> • Civil society organisations such as the National Energy Research Centre on applied research will work to set examples and bridge the gap between government and private sector as well as to implement projects enhancing integration of RE/EE within local and rural communities, as well as with public authorities. <p>Cross-cutting issues of the strategy:</p> <p>Governance: The strategy will further contribute to the EU support for improving governance in the sector, e.g. through cross-sector institutional capacities and coordination at policy and implementation levels, including policy development, planning, joint implementation, financing mechanisms, public finance management at sector level with enhanced results-oriented budgeting, monitoring and evaluation, and increased involvement of social partners and civil society. The increased involvement of Civil Society Organizations (CSOs) is foreseen through the dissemination strategy on solar water pumping systems and through their capacity building to engage effectively with the national authorities.</p> <p>Gender: Measures to support the involvement of women in the labour market have been emphasized in the frame of identification and consultative process with all stakeholders and implementation strategy. Increasing women’s participation through awareness campaigns and lobbying actions by NGOs/CSOs and reflecting this in the current sector budget support together with other gender specific issues are foreseen in different components, including in policy development, strategies and action plans, gender sensitive budgeting practices, etc.</p> <p>Youth Unemployment: The strategy addresses the inadequate quality and relevance of the education and training on the strategy and Environmental issues, as well as the mismatch between individuals’ skills and employers’ needs, and the weak school-to-work transition systems.</p>
<p>The 2020-2025 National Agricultural Development Strategy.</p>	<p>CSOs such as Farmers Union and other Agricultural Cooperatives broadly were endorsed within the proposed priorities, in particular the work envisaged in support of SMEs and energy sector reform.</p>
<p>National Climate Change Health Adaptation Strategy and Action Plan of Jordan (2013-2017).</p>	<p>Among the guiding principles of the plan, CE includes “building knowledge, awareness and understanding of climate change impacts on human health and the need to prepare for these changes; enabling dialogue between decision-makers, researchers, businesses, NGOs, local communities, etc to implement appropriate and accepted actions for achieving sustainable population health; and cooperate with identified stakeholders”.</p>

<p>Jordan Response Plan JRP (2020-2022).</p>	<p>The JRP 2020-2022 shows Jordan’s enduring commitment to continue to build an integrated multi-year framework to most effectively respond to Syria crisis in a transparent, collaborative and sustainable manner in line with the Global Compact on Refugees and the 2030 Agenda. Jordan Response Plan maintains collaborative and transparent principles to develop the interventions under the plan, by working hand in hand with more than 150 national and international partners. The top priority of JRP 2020-2022 is to empower the systems to address such challenges, thereby protecting the dignity and welfare of Syrian refugees and vulnerable Jordanians impacted by Syria crisis, its success will depend on the continued collaboration with the international community and their uninterrupted support. Thus, to ensure a more aligned plan, the plan is comprised of 7 sectors. The sectors are: Public Services, Education, Health, Economic Empowerment, Social Protection and Justice, Shelter, and WASH.</p>
<p>Jordan Decentralization law 2015</p>	<p>It reflects the commitment of the government of Jordan to move towards a culture of popular participation at the sub national levels of the government. A national committee for the decentralization reform was setup to coordinate the implementation process. Government Councils in the 12 governorates of Jordan were elected based on this law to act as a subnational bodies closer to the community citizens.</p>
<p>Jordan’s membership of the Open Government Partnership³⁶⁷</p>	<p>Jordan has made timebound commitments on open government reforms and collaboration with civil society Although Jordan’s open government action plan for 2018-2020 does not contain commitments related to transparency and public engagement related to climate mitigation and adaptation.</p>
<p>Jordan’s membership of the Global Partnership for Social Accountability³⁶⁸</p>	<p>Aims at enhancing citizens’ voice and, just as importantly, supporting the capacity of governments to respond effectively to their voice. The GPSA is based on constructive engagement between governments and civil society in order to create an enabling environment in which citizen feedback is used to solve fundamental problems in service delivery and to strengthen the performance of public institutions.</p>

3.2 Lessons learned

Citizen engagement in Jordan has worked within different levels. At many instances, it included only an inform and consult approach to solving environmental and energy impacts as indicated by the scoping sessions of the Environmental and Social Impact Assessments (ESIA) supervised by the Ministry of Environment. This was implemented in many strategies such as the ones mentioned above.

In the last few years it has been apparent that Jordan has been striving through different guidelines and regulations toward decentralization and increased citizen engagement through collaboration and empowerment. New strategies and laws listed above have shown more indication of moving toward these processes and targets. Still, slowly progressing many gaps and obstacles were identified. In 2015, Jordan produced the Jordan decentralization law where Government Councils in the 12 governorates of Jordan were elected based on this law to act as a subnational bodies closer to the community citizens. With the approval of this law, the government has undertaken the first step towards the promotion of a more bottom up approach from citizen to service provider to the identification of service needs and policy priorities, based on the role of the new elected councils in the municipalities and governorates. Many challenges still exist. These include among others:

³⁶⁷ <https://www.opengovpartnership.org/members/jordan/>

³⁶⁸ <https://www.thegpsa.org/who-we-are>

- The Government did not provide the necessary tools for the GCs to accomplish its objectives.
- There is still a significant legal gap between approving and implementing projects and plans.
- The community as well as GC elected members perception and understanding of the council's duties, jurisdiction, and limitations is a big challenge, especially in distinguishing between the services provided by the municipality and the services provided by the GC.
- Regulatory overlaps regarding powers and jurisdictions of GCs and other governmental bodies exist especially with the Ministry of Interior, Ministry of Public works, and Ministry of Local affairs.

Many projects promoting citizen engagement and participation, especially women and youth, have been conducted with the assistance of many international organizations such as the World Bank, USAID, European Commission, Organization for Economic Cooperation and Development (OECD), and the International Union for Conservation of Nature (IUCN) among others in cooperation with local CSO and NGOs. These projects worked on the community levels and direct contact with citizens. These mainly included training, capacity building, and communication with community members, with youth and women as the main targets.

One example on climate change impacts and challenges was through the IUCN. Recognizing the important role that women can play in this regard, the Government of Jordan requested the IUCN, through its regional office based in Amman, to assist in the drafting of a gender sensitive Program for mainstreaming gender in climate change efforts in Jordan. The main objective was “to ensure that national climate change efforts in Jordan mainstream gender considerations so that women and men can have access to, participate in, contribute to and hence optimally benefit from climate change initiatives, programs, policies and funds.” If adopted, it will be the first of its kind in the Arab region.

Another direction where the Government of Jordan is moving is the use of e-Government and digital engagement. In the last ten years Jordan has been working to convert its services through internet where monetary services, documents, and communication with government bodies has been established. Digitization was also efficient in the private sector in Jordan including banking among others. Many supporters of e-Government around the world believe that this technology will enhance the engagement and participation of citizens in politics and government. The evidence is still weak in Jordan that socioeconomic developments and political participation will move hand in hand.

The preparation of the upcoming open government action plan for Jordan could serve as an opportunity to highlight climate, development, engagement and transparency issues and make a commitment to enhancing these, by adopting commitments such as:

- *Track and publicize climate-relevant policy implementation and results*, such as those associated with Nationally Determined Contributions, 2020 pledges, long-term low greenhouse gas emission development strategies and green growth/sustainable development strategies relevant for the SDGs.
- *Provide greater transparency of information on climate and sustainable development in national budgets*, such implementing cross-government budget systems and processes that enable the identification, tracking and regular reporting of domestic resources mobilized for low and high-emission activities.

Lastly, a coherent roadmap for the implementation of decentralised consultation is necessary to reach potential objectives. It should underline creating community leaders among local public officials and non-governmental stakeholders to orchestrate the character of the reform, raise awareness, provide training, reconcile increasing expectations among civil society and citizens to play a more active roles, and institutionalize partnerships with locals CSOs and citizens. It will ensure citizens can become active drivers of the national planning process and empowerment.

The main highlights and conclusions of citizen engagement in Jordan can therefore be summarised as:

- The type of engagement that has been happening in Jordan to date is usually stakeholder engagement rather than citizen engagement

- Citizen engagement is limited to and focusing mainly on ‘inform’ & ‘consult. Empowerment does not exist.
- Stakeholder engagement in Jordan included Government, private sector, NGOs, and CSOs; but did not dig enough toward citizens.
- Regulatory / legal structures exist but are narrow and lack enforcement where CE has not yet been happening on the ground.
- Opportunities such as those presented by e-Government, digital engagement and open government commitments might provide the tools for enhancing future engagement around the LTS and other similar processes.

4 Jordan’s LTS – Recommendations for the citizen engagement approach

This section draws on examples above and the experience in Jordan to date to present an overview of potential citizen engagement approaches for Jordan’s LTS.

4.1 Who needs to be engaged? Identifying stakeholders

Task teams should start by mapping out relevant citizen stakeholders. Accordingly, teams can differentiate between stakeholders and select those who can provide analytical inputs and with whom collaboration might be possible; who can be consulted to gain an understanding of citizens’ perceptions and perspectives on local development challenges (such as CSOs or community organizations); and with actual citizens who suffered the impacts of climate change. A list of citizen stakeholder groups may include the following:

Table 4-1: Citizen stakeholder groups

Groups of analytical inputs	CSOs and community organizations	Citizens
<ol style="list-style-type: none"> 1. Research and studies centers. 2. Universities 3. Media 	<p>A list of CSOs in Jordan is listed under the Comprehensive Guide to Civil Society Organizations. It can be seen at the website (www.civilsociety-jo.net). It basically divided into:</p> <ol style="list-style-type: none"> 1. Business owners’ organizations 2. Professional unions and societies 3. Specialized centers (women, youth and orphans, disabled, environment, sports) 4. Charity societies. 5. Studies and research centers 6. Foreign aid entities 7. Social and human rights organizations 	<ol style="list-style-type: none"> 1. Vulnerable groups including (women, youth, disabled, immigrants (Syrians), farmers, traders,...etc). 2. General public.

Aspects that may influence the selection of stakeholders from the above mentioned groups include the desired level, depth or scale of participation, the interest and capacity of the government and other relevant citizen groups, cost and time, and most important the locality of any suggested activity.

4.2 How to engage? Citizen Engagement Mechanisms

A variety of mechanisms exist for citizen engagement, spanning the range of levels of engagement, from *informing* and *consulting* to *collaborating* and *empowering* citizens. A few examples include:

- Informing e.g. public hearings and focus group discussions.
- Consultation e.g., public hearings, focus group discussions, structured surveys, and written and online submissions
- Collaboration e.g. citizen membership in decision-making bodies, participatory planning, and participatory or collaborative research.
- Empowerment e.g. participatory planning / budgeting, citizen ownership of projects through e.g. community benefit organisations

Table 8-2 lists possible mechanisms for carrying out these approaches (see 1st column) which are relevant in the context of citizen engagement in Jordan for the LTS.

Table 4-2: Engagement mechanisms

Approach	Action	Targeted citizens	Responsibility	Time Frame	Measurement	Outcome	Budget
Inform	Media (TV, Radio, Newspapers) messages	General public	Communication Engagement Team Media partners	Initiation & ongoing	No. of messages	Increase understanding and promotion of citizens voice	Up to \$45k for a full media package
Inform	Develop a series of video clips and proactive tools that explain how the community and citizens can provide input	CSOs, NGOs, and local citizens & public officials	Communication Engagement Team Community Engagement	Initiation & ongoing Publication	Feedback No. of views per video clip and/or hits on relevant webpage	Increase citizens understanding of the climate change issues and policies.	
Inform	Community briefing meetings	CSOs and NGOs, local citizens	Communication Engagement Team Local government authority (Mayor, Governor).	Ongoing	Number of subscribers and their feedback	No. of briefings held. No. participating	Staff Time + \$1400/ day (JD1000)
Inform	Conduct capacity building seminars for engagement of local officials and citizens/ CSOs	CSOs , NGOs, local citizens and local public officials	Project managers (sectoral implementation leads)	Initiation & ongoing Lead by timelines of sectoral implementation plans	No. of participants. No. of seminars	Increase understanding of the climate change issues and policies.	Staff Time + \$1400/ day (JD1000)
Inform	Education in primary and secondary schools , and beyond	School children and adults in lifelong learning / general public	Educational ministries developing curriculums and schools	Initiation & ongoing	No. of school children and adults undertaking courses	Increase understanding of the climate change issues and policies.	

Inform	Conduct community engagement seminars	CSOs , NGOs, local citizens & public officials	Communication Engagement Team Community Development	Annual	No. of seminars No. of participants Seminar feedback results	Increase citizens understanding of the climate change issues and policies.	Staff Time + \$1400/ day (JD1000)
Consult	Develop and sustain online communications	CSOs, local citizens & public officials	Information Technology Communication Engagement Team	Ongoing	No. of developed lines of communications	Increase promotion of opportunities for citizens to have a say.	Staff Time
Consult	Develop and promote newsletters to distribute information and ask for feedback	General public / affected citizens, NGOs, CSOs	Communication Team	Ongoing (regular schedule)	Feedback No. of participants	Increase citizens understanding of the climate change issues and policies.	Unclear, depends on scope and scale
Consult	Promote community participation in social media platforms	General public / affected citizens and CSOs	Community Engagement Team	Ongoing	Participation of committees No. of social media platforms	Increase promotion of opportunities for citizens to have a say.	Staff Time
Consult	Using websites to collect feedback and track suggested projects	CSOs, NGOs, local citizens	Information Technology Communication Engagement Team	ongoing	No. of projects No. of participants	Increase promotion of opportunities for citizens to have a say.	custom website development costs vary widely - \$5000 to \$50000+ depending on complexity and functionality

Consult	Develop and sustain Social media messaging groups (Facebook, WhatsApp,...etc)	General public and CSOs	Communication Engagement Team	Ongoing	Number of subscribers and their feedback	Increase understanding and promotion of citizens voice	Staff Time
Consult	Develop a citizen and CSOs led monitoring, evaluation	Affected citizens & CSOs	Communication Engagement Team	Ongoing (including future monitoring role)	No. of CSOs participation	Build trust among citizens and policy makers Increase citizens empowerment	Staff Time (significant)
Consult	Focal group, regional and national Workshops with relevant groups of stakeholders	Affected citizens, CSOs	Communication Engagement	Periodic – likely at initiation, during technical development and for validation	Feedback	Dissemination of information. Increase understanding of community leaders and promotion of citizens voice Feedback on priorities, technical elements	Staff Time + \$1400/ day (JD1000)
Collab/ Empower	Public Open Meetings on Community level Validation meetings, community and local level meetings, exposure visits	CSOs Local Citizens	Communication Engagement Team Government authorities Officials/Leaders	Periodic – likely at initiation, during technical development and for validation	Feedback No. of participants	Increase understanding of community leaders and promotion of citizens voice	Staff Time + \$1400/ day (JD1000)
Collab/ Empower	Citizen assembly or conference for the representative cross section of society	CSOs Representative cross section of society	Scientific bodies / universities	Ongoing (including future monitoring role)	Feedback No. of assembly meetings	Structured citizen monitoring and review process for input and validation	Costs vary considerably: Ireland >\$700k (>€600k) ³⁶⁹

³⁶⁹ <https://www.irishtimes.com/news/ireland/irish-news/citizens-assembly-costs-run-over-initial-estimates-1.3138171>

Collab/ Empower	Dialogues / crowdsourcing ideas and policy solutions	CSOs General public	Communication Engagement Team Government authorities	Sporadic – for particular technical issues and needs	No. items of feedback received	Un-structured citizen inputs	Scotland \$2m (£1.4m) ³⁷⁰ Varies from free to high cost if using a moderated platform
Collaborate	Hackathons open to students or the public, for finding solutions to technological, policy or science issues for example. A good example is listed within https://earthhacks.io/	Students, businesses, general public	Communication Engagement Team	Usually held over a 24 hour period Sporadic – for particular technical issues and needs	No participants No outputs	Sets of solutions (usually technological)	Varies from free to high cost if using a moderated platform
Collaborate	Citizen representative groups should be part of the LTS steering committee	CSOs	NCCC	To participate in regular meeting schedule	Attendance at meetings Inputs provided	Representative voice included in highest climate decision-making body	Minimal
Empower	Citizen led local governance structures for governing local project implementation ³⁷¹ e.g. local community groups can make decision on how to spend adaptation funds locally, or supported in the creation of community enterprises for adaptation and mitigation solutions. This could be delivered through neighbourhood groups / governance structures.	Local community	Local government and/or project implementers	Longer term, post LTS development as part of implementation of actions	No. citizen led local governance structures	Creation of community-based decision making structures	Ideally ultimately self- financing or funded via project implementation
Collab/ Empower	Participatory budgeting	Local citizens affected by local government decision	Local government	Longer term, post LTS development as part of implementation of actions	No. of local governments using PB /yr and PB events / yr	Local citizen empowerment over local budgetary decisions	Cost of publicising & hosting regular e.g. quarterly

³⁷⁰ <https://www.scotsman.com/news/scottish-news/scotlands-citizens-assembly-cost-taxpayers-ps14-million-1404331>

³⁷¹ For example <https://www.tasc.ie/publications/the-peoples-transition-communityled-development-fo/>

4.3 Jordan’s LTS – Recommendations for the citizen engagement approach

This section draws on examples above and the experience in Jordan to date to present a recommended citizen engagement plan for Jordan’s LTS development and implementation. Table 4-3 presents the LTS elements developed at each stage of the timeline, specifying for each which citizens should be engaged (who?), and how.

As shown in Table 8-2 and Table 4-5, there are many possible ways of designing citizen engagement to *inform, consult, collaborate* with and *empower* citizens in decision making processes, but the guiding principle should be to increase the amount of citizen engagement, such that collaborative decision making with citizens, or even empowered decision making, are used wherever appropriate.

At the LTS development stage, the proposal is to:

- d) convene a **citizen panel** which will be informed (educated), consulted and part-take in collaborative decision making, plus,
- e) informing and consulting the general population through **informational campaign** and online voting platform.
- f) Specifically for the adaptation elements, informing, consulting and collaborative decision making with citizens who have **lived experience of the key vulnerabilities** that Jordan faces.

There is also a role for those who can provide **specialist knowledge and expertise** (researchers, academics, etc) and those who **represent citizen groups** (such as CSOs or community organizations), to facilitate the process of convening the citizen panel (and representatives of vulnerabilities), and build the capacity of the citizens (education) to enable them to make informed decisions through deliberation.

At the LTS implementation stage, a variety of engagement mechanisms can be used depending on the nature of the policy being developed or action taken, and again the tables above show which options exist. Specifically recommended however is the **integrating climate change education** into the national school curriculum.

Table 4-3: Stakeholder engagement plan for the development and implementation of the Jordan LTS

Step	LTS Elements & processes
Pre-design stage Month 0-6	<p>Setting up the governance mechanisms– at this stage, the citizen engagement processes are to be finalised and working groups recruited.</p> <p>Recommend the appointment of at least one citizen panel, comprised of a representative sample of the general public of Jordanian society. Similar to the citizen assembly approach or working group, this panel of citizens will be employed to part-take in collaborative decision making regarding key decisions for the LTS development laid out below.</p> <p>The composition of the panel will be determined through a sortition process, to determine a representative sample of Jordanian society, in terms of gender, age, location, social class, race, religion, educational level, and possibly attitudes toward climate change.³⁷² An initial characterisation is below, however, more thorough analysis is required seeking advice from demographers / research bodies.</p> <ul style="list-style-type: none"> 7. Jordanians are about 70% and non-Jordanians are about 30% 8. Urban population is about 90.3% and 9.7% rural.

³⁷² In the context of government or public participation, sortition uses stratified sampling so that the demographic composition of the sample matches that of the population. In general, the final selection of participants through stratified random sampling (sortition) is proportionately representative of the population on at least three dimensions — age, geographic location or area of residence, and highest level of education — and is composed of half men and half women. Retrieved Paricipedia.net, Sortition, retrieved 03/06/2021 on <https://participedia.net/method/5507>

	<p>9. Women make about 47.5% of population. The ratio between males and females is 112.5 males per 100 females.</p> <p>10. Youth makes a high percentage of the population (0-19 of age are about 44%, 20-39 are about 33%, 40-59 are about 17%, and >60 are about 6%)</p> <p>11. Religious distribution includes 97.5% Muslims, 2.2% Christians, 0.4% Buddhist, 0.1% Hindu, and the rest is indifferent.</p> <p>12. Ethnic distribution include 69.3% Arab Jordanians, 13.3% Syrians, 6.7% Palestinians, 6.7% Egyptians, 1.4% Iraqis, and 2.6% Caucasians (Circassians, Chechens, and Armenians).</p> <p>It is important to also acknowledge that Jordanian society includes persons with disabilities, elderly persons and migrants/refugees, and low income/informal, and agricultural workers. This is because the LTS would have implications for all of them and they have a part to play in climate change mitigation and adaptation. E.g. an estimated 11 to 15 percent of the population of Jordan suffers from a disability, analysis³⁷³ by the UN outlines the impacts of climate change on persons with disabilities and the responsibilities of States and other actors in relation to disability-inclusive approaches on climate change.</p> <p>The citizen panel is recommended to comprise 30-60 citizens.</p> <p>This could be convened by one of these organizations:</p> <ul style="list-style-type: none"> - Jordan Federation of Environmental NGOs. - Jordan Hashemite Charity Organization (JHCO). - Phoenix Centre for Economic and information Studies. They produced the @Guide of Civil Society Organizations in Jordan (www.civilsociety-jo.net) in cooperation with the German Friedrich Eibert. - We Are All Jordan Youth Authority (AJYC) <p>Depending on the resources, more panels could be convened, e.g. 1 per governorate. If 1 panel per governorate is desired, it may be worthwhile to develop this under the umbrella of the Decentralized Governorate Counsels. The law of internal affairs (under preparation) will provide the legal support for such panels.</p> <p>The role of the citizen panel will be to learn through training by relevant experts (academics, research institutes, CSOs) on each of the elements of the LTS where their views are sought. They will be facilitated through deliberative discussion, where each can share and consider others' views. Following this, they will reach conclusions on their views, which will be recorded and shared as a consultation, or vote on where decisions are required. The citizen panel should be considered a Tier 1, high priority stakeholder group, and partners in the decision making process with the government. In particular, if there is any decision they strong disagree with, this should not go ahead. In addition, representatives of the citizen panel should be part of the steering committee.</p> <p>Alongside the citizen panel, CSO and NGOs organisations (that can also be said to represent citizens) will form part of the stakeholder groups with the role of experts consulted throughout the LTS development process, which is dealt under the 'stakeholder engagement' section below.</p>
<p>Design stage – strategic</p>	<p>Vision definition – citizen panel is trained by relevant experts in the stakeholder groups, such as leading climate CSOs, experts at the German Jordan University as well as the Energy Research Center at the Royal</p>

³⁷³ <https://undocs.org/A/HRC/44/30>

<p>Month 6-12</p>	<p>Scientific society. The citizen panel will then collaborate in deciding key components for the vision e.g. SDGs, mitigation, adaptation and economic priorities as a ‘top down’ framework for initial consultation, possibly complemented by 6 month informational campaign, explaining the purpose and remit of the LTS with links to further information online is advertised through mass media aiming to collect of feedback from the general public, using interactive and easy to use online voting and feedback platforms.</p> <p>Climate strategy – citizen panel citizen panel is trained (by the same CSOs and experts as before) and will collaborate in deciding priorities in terms of the pillars, and final LTS framework.</p>
<p>Design stage – strategic</p> <p>Month 6-18</p>	<p>Adaptation elements – review and update adaptation analysis</p> <p>This requires the engagement of citizens with knowledge and lived experience of climate impacts and adaptation strategies. As such, citizen groups from the most vulnerable regions and categories of citizens should be trained (by relevant CSOs and experts) consulted via the adaptation working group, in workshop format. Section 8.5.1 provides detail on how this could be done in practice.</p> <p>Vulnerable regions suffering from climate change impacts are distributed around Jordan. An example is the south of Jordan, Petra, which has seen annual destructive floods. In Amman, the Capital, downtown was susceptible to floods many times. Local community knowledge of how to deal with changing climate will be combined with expert knowledge from CSOs and universities as part of the adaptation working group.</p> <p>Identify adaptation priorities and / or approve pillars</p> <p>As before, citizens from vulnerable group or regions engaged through adaptation working group. Citizen panel also engaged at this point to learn about (trained by relevant experts and CSOs) and collaborate in decisions making on adaptation priorities / approve pillars.</p> <p>Identify options to enhance adaptive capacity</p> <p>As before, citizens from vulnerable group or regions engaged through adaptation working group.</p> <p>Mitigation elements</p> <p>Consultation on pathways outputs from the modelling – citizen panel also engaged to learn about and collaborate in decisions making on adaptation priorities / approve pillars.</p> <p>Climate change strategy</p> <p>Iteratively refine, elaborate and finalize pillars and actions based on the analytical work undertaken for the adaptation elements and mitigation elements – citizen panel engaged for final approval.</p>
<p>Post-design stage (implementation)</p> <p>Month 18-24+</p>	<p>Mainstreaming</p> <p>Work with entities to elaborate sectoral pathways and strategies –a key principle in the sectoral strategies should be a commitment to adopting high quality citizen engagement, to at least the level of collaboration as partners in decision making, if not complete empowerment, following the model used for the development of the LTS. This can use the mechanisms outlined in Table 8-2 and Table 4-5. Specifically, integrating climate change education into the national school curriculum is recommended.</p>

	<p>Governance</p> <p>Establish a monitoring plan and revision process – as part of the periodic review process, evaluations of the effectiveness of citizen engagement in the LTS implementation in should be undertaken, and necessary actions taken to ensure the highest standard of citizen engagement is being practiced throughout the implementation of the LTS.</p> <p>Communication</p> <p>Consultation processes on the draft LTS - collection of feedback on the draft by the general public through a 6 month campaign advertised through mass media for the collection of feedback from the general public, using interactive and easy to use voting and feedback platforms. Following this, a final convening of the citizen panel to evaluate general public feedback and make any adjustments to the draft given this.</p>
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Finally, regarding **timing**, although key points in time for citizen engagement are identified in Table 4-3, such as consultation on outcomes, the LTS itself will likely be iterative, with research and analysis adjusting the pathways and priorities, and consultation feeding in at various points. Figure 4-1 captures some of this iteration with a focus on the pre-design to the strategic design stages, attempting to show the role of engagement as central to defining, testing and confirming priorities.



Figure 4-1 : Citizen and stakeholder engagement as part of an iterative development process

Source: Developed by Ricardo Energy and Environment

4.3.1 Citizen Engagement on Adaptation elements of the LTS

While the citizen's panel will be composed of a representative sample of Jordan's population, the citizen groups involved in the adaptation working groups will be specifically representative of those with lived experiences of Jordan's key climate change vulnerabilities in each of the sub-sectors shown in Table 8-4. Where there are differences in regions e.g. North and South, representatives of each region should be present. Examples of representatives include fishermen, populations with water supply shortage and farmers.

Table 4-4: Jordan's key climate change vulnerabilities by sector

Sector	Sub-sectors (regions North or South)
Water	Water supply (S)
	Water supply (N)
	Surface water management (S)
	Surface water management (N)
	Groundwater management (S)
	Groundwater management (N)
	Water collection (S)
	Water collection (N)
	Wastewater treatment
Agriculture	Crops (N)
	Crops (S)
	Livestock (N)
	Livestock (S)
Fisheries	Marine fishing
	Aquaculture
Forestry	Public forest management (NW)
	Private forest management (N-highlands)
Ecosystems	Terrestrial ecosystems (S)
	Terrestrial ecosystems (N)
	Freshwater ecosystems
	Coastal ecosystems
Health	Physical health (S)
	Physical health (N)
Built Infrastructure	Other (Aqaba)
	Other (Amman/Salt)
	Buildings (N)
	Buildings (S)
Transport	Roads (N)
	Roads (S)
Energy	Electricity
	Gas (Aqaba)
Business	Sales and services (mainly Amman)
	Tourism (Petra, Dead Sea, Aqaba)
	Financial (mainly Amman)
Manufacturing	Plastics and plastic products (N)
	Plastics and plastic products (S)
	Other (N)

	Other (S)
Mining and Quarrying	Mining (N)
	Mining (SW)
	Quarrying (Jerash-Petra)

These citizens will be engaged in the following way, for each of the steps:

- **Review and update adaptation analysis** - citizens will report on their own vulnerabilities based on their lived experience, and validate the analysis
- **Identify adaptation priorities and / or approve pillars** - citizens state their own priorities based on their lived experience, which will inform the discussion on the pillars, and help identify the gaps in them, with the ultimate aim of prevent and increase in vulnerabilities and encourage their decrease.
- **Identify options to enhance adaptive capacity** – citizens will be asked, as representatives of vulnerable groups, what has prevented them from achieving the LTS vision, what barriers and challenges they face, and what can be done to overcome these.

Note, other stakeholders will be part of the adaptation working groups, including policy makers who have been involved in developing national and sub-national adaptation plans, and other relevant experts and organisations. As before, the citizen representatives as non-technical experts, will likely need capacity building (education) and facilitation in order to make informed decision through deliberation.

4.3.2 Other possible citizen engagement mechanisms for the LTS development and implementation

There are many possible ways of designing citizen engagement to *inform, consult, collaborate* with and *empower* citizens in decision making processes. Table 4-5 maps other possible citizen engagement mechanisms (drawing from Table 8-2) against the LTS elements, identifying where they could be used.

Table 4-5: Engagement mechanisms relevant to LTS elements

Approach	Mechanism	Vision	Mitigation	Adaptation	SDGs	Governance	Implementation	Integration into sectoral strategies	Monitoring
Inform	Media messages	x				x	x	x	x
Inform	Video clips and proactive tools e.g. YouTube Channel	x	x	x	x				
Inform	Community briefing meetings			Local input to identify impacts			x		
Inform	Capacity building seminars for local officials and citizens/ CSOs	x	x	x	x		X		
Inform	Community engagement seminars						X		
Consult	Online communications.	X	X	X	X				
Consult	Newsletters (to inform and consult)	X	X	X	X				

Approach	Mechanism	Vision	Mitigation	Adaptation	SDGs	Governance	Implementation	Integration into sectoral strategies	Monitoring
Consult	Participation in social media platforms	x	X	X	X		x		
Consult	Websites and web tools to collect feedback	Crowd sourcing priorities			Crowd sourcing priorities		x		
Consult	Social media messaging groups	X							
Consult	Citizen and CSOs led monitoring, evaluation								x
Consult	Workshops with relevant stakeholders		Focal group discussions with citizen representatives in each sector e.g. CSO, universities etc.	Focus group with local communities to harvest local knowledge & expert organisations				Focus group consultations for relevant citizen groups	Focus group consultations for relevant citizen groups
Collab/ Empower	Public Open Meetings at community level						x		

Approach	Mechanism	Vision	Mitigation	Adaptation	SDGs	Governance	Implementation	Integration into sectoral strategies	Monitoring
Collab/ Empower	Citizen assembly	For a representative cross section of society	For a representative cross section of society	For a representative section of society	For a representative cross section of society	Held annually to discuss governance of LTS			
Collab/ Empower	Dialogues / crowdsourcing	x	x	x			x	x	
Collaborate	Hackathons		X On technical elements	X On technical elements			x	x For technological solutions	
Collaborate	Citizen representative on the steering committee					X			
Empower	Citizen led local governance structures						x		
Collab/ Empower	Participatory budgeting						x		

4.4 Planning for effective citizen engagement and outreach

Lastly, the below table lists considerations for planning, publicizing, and monitoring effective citizen engagement.

Public outreach efforts should be geared towards paving the way for a systemized and institutionalized information sharing program, that could be led by the government, or by a think tank or higher academic institution.

Table 4-6: Planning publicising and monitoring citizen engagement and outreach

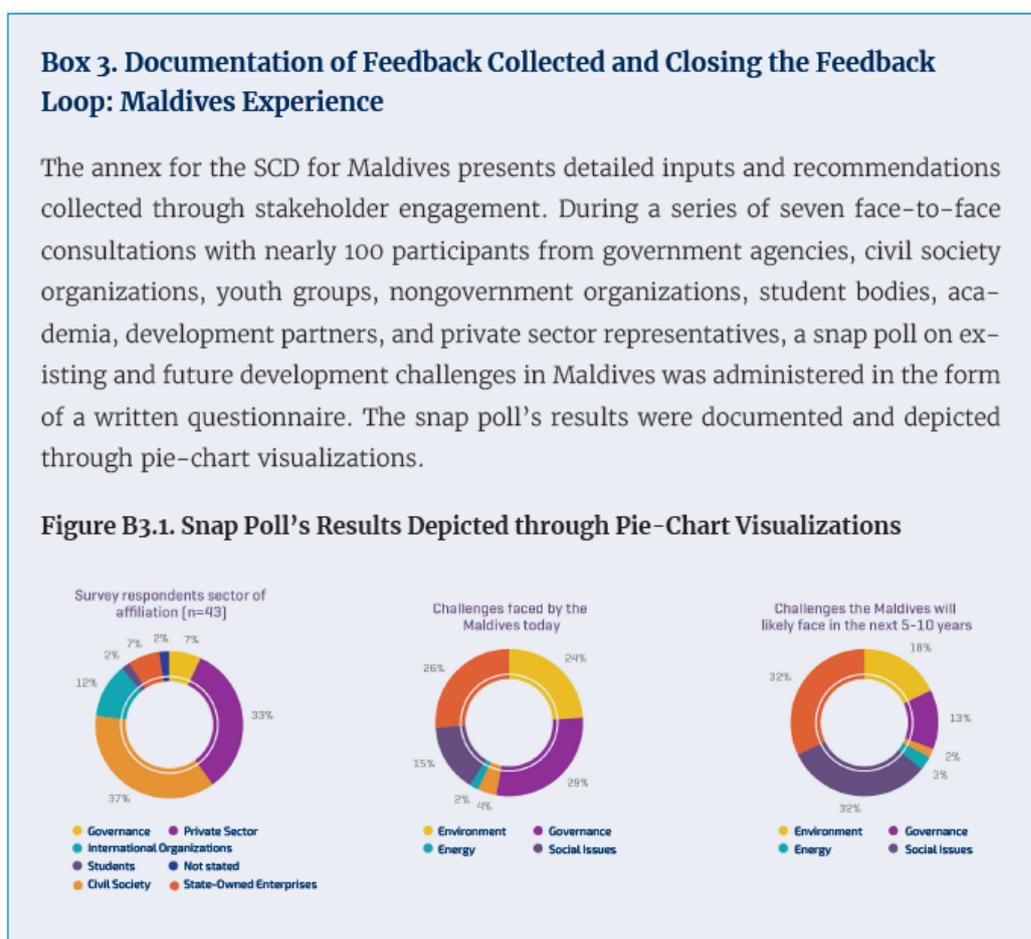
Category	Action	Responsibility	Time Frame	Measurement	Outcome	Budget
Planning for citizen engagement	Engage local committees as partners in community engagement when seeking citizens feedback	Communication Engagement Team	ongoing	Feedback No. of participants	Size of feedback	Staff Time
Publicizing citizen engagement activities	Provide a two way reporting on the number of community engagement activities undertaken by the community engagement team	Communication Engagement Team	Ongoing	Number of community engagement activities	Reporting transparency	Staff time
Publicizing citizen engagement activities	Identify opportunities to ensure that citizens are properly informed about community engagement activities	Communication Engagement Team	Ongoing	Effective communication methods in place	Citizens and CSOs are informed as early as possible in the engagement process.	Staff time
Citizen capacity building	Community Engagement Team	Annual	No. of events. No. of participating groups	Increase citizens understanding of the climate change issues and policies.		
Monitoring citizen engagement	Social representation and level of public awareness of climate change survey	Annual or biannual	Ongoing	Level of awareness Public representation	Ability to track awareness levels in a representative sample	
Monitoring citizen engagement	Develop and sustain a grievance redress mechanism	Communication Engagement Team	ongoing	No. of complaints No. of addressed complaints	Build trust among citizens and policy makers	Staff Time

Monitoring citizen engagement	Develop and sustain citizen feedback database and proposed projects	Communication Engagement Team Information Technology Staff	Ongoing	No. of projects No. of participants	Increase promotion of opportunities for citizens to have a say.	Staff Time
Monitoring citizen engagement	Publications - Project summary - Documentary - Policy briefs - Project brochure - Advocacy publication - Promotional materials	Communication Team	Ongoing	Number of publications and copies.	Dissemination of information Increase understanding of community leaders and promotion of citizens voice	

4.4.1 Documenting inputs provided by citizens

Good recordkeeping and reporting of both processes and outcomes of citizen engagement in the development of the LTS strategy are very essential. Documentation should include stakeholder identification methods; participant lists, meeting summaries, and submissions; and questions, feedback, and inputs organized according to relevant categories (e.g., stakeholders and themes). As a good practice to ensure genuine deliberation on the feedback provided, task teams should share feedback summaries with decision makers in the Jordan Government, steering groups, funders and CSOs; publish and disseminate them to close the feedback loop; and archive feedback so other all stakeholders can access it as needed. An example of documentation and record keeping in the Maldives is shown Figure 4-2.

Figure 4-2: Maldives feedback documentation



Source: Masud (2019)³⁷⁴

4.4.2 Closing the Feedback Loop

It is critical that task teams to be proactive approach in reporting back on the actual outcomes of public participation to “close the loop” in any given round of engagement. Summaries of inputs provided by citizens should be made public. The participants of consultation meetings should also be informed of the ways their ideas and concerns are being tackled and incorporated into problem solving by decision makers, or why some ideas cannot be considered or incorporated. Reporting back to feedback providers can follow country-specific formats, such as the publication of a comment-response matrix on a designated web page, or through local and community radio or personal visits in remote areas. It was recently announced that the Government of Jordan intends to build a national and cumulative website to include all national authorities. It is highly recommended to include local CSOs and citizen representation; working more like a National Assembly. Such measures are useful to deepen people’s understanding of the relevant issues, foster mutual respect, and contribute to the authenticity and accountability of the interaction (Public Agenda 2008).

³⁷⁴ Masud, H. (2019) Mainstreaming Citizen Engagement through the World Bank Group’s Country Engagement Model. <https://openknowledge.worldbank.org/bitstream/handle/10986/34074/Mainstreaming-Citizen-Engagement-through-the-World-Bank-Group-s-Country-Engagement-Model.pdf?sequence=4&isAllowed=y>

Annex 7 – Review of Opportunities and Mechanisms for Mainstreaming Gender

1 Introduction

This report in support of the LTS Roadmap for Jordan presents a gender-responsive framework to address forms of existing inequalities between men and women in relation to climate change. It outlines how the Jordan LTS can capitalize on opportunities of mitigation and adaptation to advance gender equality. It provides a number of concrete steps and commitments that should be prioritized on the national agenda of climate resilience, it also provides and a set of indicators to measure the implementation of these steps and its impact on climate resilience and mitigation of GHG emission (net zero emissions' goal).

This report was developed upon reviewing Jordan's commitments to international agreements towards climate change, commitment towards gender equality and sustainable development, best practices of using a "gender tagging" approach in climate change adaptation and mitigation from other countries, a review of Jordan's INDC and the progress made on gender equality commitments, in addition to reviewing the National Strategy for women 2020-2025 and a number of other national documents and strategies including; Jordan vision 2025, Jordan's UPR recommendations, SDGs National Report, State of the country report and gender climate tracker

2 Rationale: Why should gender equality be a priority in Jordan's LTS?

Women, girls, boys and men experience the impacts of climate change in different ways and have different needs, opportunities and capacities to respond. In many contexts, women face additional barriers to adaptation compared to their male counterparts due to social norms and practices that limit their access to information, resources and opportunities (IUCN & UNDP, 2009; CARE, 2010). Additionally, men and women have different roles and responsibilities, which vary by socioeconomic level; this creates differences in the impacts of climate change, responses to climate change, vulnerabilities to climate change, and the capacities to adapt. It is essential to understand what men and women do, what resources they have, what challenges they face in light of climate change, and what their needs and priorities are in order to adjust to climate change through better understanding vulnerability, opportunities and commitments to gender equality.

The importance of incorporating gender in the LTS reflects Jordan's commitments and prioritisation of gender equality and its link to women's economic empowerment, a major goal for Jordan.

This section looks at climate and development vulnerabilities and context for gender, and economic participation as the two key areas of analysis for the LTS. It then summarises the main opportunities and commitments to date in Jordan.

2.1 Climate and development context

Women in rural areas are placed in a position wherein they are disproportionately affected by climate change: In rural areas of Jordan, women are more vulnerable to the effects of climate change than men are, particularly because women constitute the majority of the poor and are dependent for their livelihoods on natural resources that are threatened by climate change. In the country, almost **9.1%** of female-headed households are food insecure or vulnerable to food security, compared to 5.7% of male-headed families³⁷⁵. Women also face significant social, economic, and political barriers that negatively affect coping capacities and those charged with the responsibility to secure water, food, and fuel for cooking and heating face the greatest challenges, exacerbated by unequal access to resources, barriers to decision-making processes and limited mobility.

Climate awareness: Rural women's existing theoretical knowledge and understanding of climate change and adaptation remain limited, impeding their ability and willingness to act and find long term adaptive solutions. Rural women rely on their existing field experience and coping mechanisms to deal with changing climate conditions, but they are not yet capacitated to build on their traditional knowledge to develop appropriate sustainable adaptation strategies.

Unequal impacts of actions: Studies have found that in some cases adaptation actions have led to increased workload and reduced decision-making power for women³⁷⁶. Consideration of gender issues therefore provides a critical basis for understanding differential vulnerability to climate change and addressing the underlying causes. The LTS presents an opportunity to address gender inequalities; by acknowledging gender differences in the process, efforts can be made to empower women as agents of change and overcome traditional barriers to women's participation in decision making³⁷⁷.

Influencing low-emissions development pathways: Billions of women around the world make decisions every day that influence the amount of carbon that is released into the atmosphere. This influence differs from that of men owing to women's socially ascribed roles as home-makers (where decisions influence emissions e.g. from domestic cooking), as farmers (influencing soil carbon emissions), and as consumers (purchasing decisions influencing emissions from the entire lifecycle of production, consumption, waste disposal).

Potential climate impacts and their risks: findings from the Jordan Vulnerability and Risk Assessment

Population groups and key assets exposed to hazards are identified in the detailed assessment for each sector. However, **in all cases, women are particularly exposed.**

Indeed, the impacts of climate change are not gender neutral. Globally, women and girls are disproportionately affected by the impacts of the climate crisis, as existing vulnerabilities are intensified and intersect with a range of social, economic and political inequalities. A business-as-usual approach is likely to exacerbate existing inequalities and limit the opportunities to develop gender equality.

For example, in the health sector in particular, potential impacts may be larger on women, as they are often responsible for caregiving and for sourcing water for family and communities. In the agricultural sector, climate impacts may also be felt more largely, as women have limited access to land ownership, but represent a large proportion of agricultural workers. Women are also often responsible for water harvesting at a household level and for agricultural practices

Box 2-1: Jordan's Vulnerability and Risk Assessment conducted for this LTS Roadmap. Findings show that women are particularly exposed

³⁷⁵ UN Women, Rural women and climate change in Jordan <https://jordan.unwomen.org/en/digital-library/publications/2018/rural-women-and-climate-change-in-jordan>

³⁷⁶ Sovacool, B.K. & Linner, B.O. (2016). The political economy of climate change adaptation. New York: Palgrave Macmillan.

³⁷⁷ World bank, 2011, Gender and climate change, three things you should know, Washington DC

2.2 Economic participation context

Women's economic participation: Jordan is one of the lowest globally, ranked 131 out of 156 on the 2021 gender gap index, and 133 out of 156 on economic participation and opportunities. Climate change adaptation and clean energy presents an opportunity for increasing women's participation in the labour market. The government of Jordan has set an ambitious target of increasing the female labour force participation to 24% over the next five years and has developed a Women's Economic Empowerment Action Plan³⁷⁸, closely linked to the development of the National Women Strategy (2020-2025), to identify the broad focus of required actions. Unemployment rate in Jordan has reached (23.9%) during the third quarter of 2020; 33.6% for females compared to 21.2% for males. Male unemployed percentage of bachelor holders and higher was 25.2% against 77.0% for females showing there is a very large talent pool of educated females looking for jobs.

Economic growth: In the MENA region, women generate only 18% of GDP, suggesting greater inclusion is a major economic growth opportunity³⁷⁹.

- A 2015 McKinsey study found that women generate only 37% of the global Gross Domestic Product (GDP), but that closing this gap could add between USD 12 and 28 trillion to the global economy.
- In ILO's women in Business and Management published in 2019, to understand how sensitive GDP growth is to changes in female employment, researchers built a panel dataset of 186 countries for the period 1991–2017 to assess the output partial elasticity of female employment. The results confirmed a positive correlation between GDP and female employment, Jordan has a relatively high elasticity at 0.193 highest measured is 0.289. This means that GDP is, on average, more sensitive to changes in female employment. This means that each (1%) increase in females will contribute - on average - to GDP growth by (0.193%).

Jordanian businesses: The 2018 census on businesses in Jordan revealed that:

- **89.7%** of establishments in Jordan have 4 employees or less compared to 6% for entities that recruit 5-9 employees and 4.3% for entities that recruit 10 employees and more.
- 44.7% of businesses are concentrated in Amman followed by Irbid (15.6%) and Zarqa (14.6) and Balqa (6.7%) and less than 4% in all other governorates.

This presents an opportunity to invest in the governorates as an analysis revealed that women choice of employment is highly influenced by having a job in the same area of residency³⁸⁰. In addition, women's participation in ownership of firms in Jordan seems to increase the larger the firm is³⁸¹ in contrast to other countries in the region.

16% of businesses are owned by women and 2% of firms in Jordan have women as a top manager. Jordan has one of the lowest levels of female participation in total early-stage entrepreneurial activity nevertheless, According to the Global Entrepreneurship Monitor report, Jordan's female-to-male ratio for Total Entrepreneurship Activity went from 0.26 in 2016 to 0.59 in 2019, an improvement of around 127 percent in only 3 years. 56.8% of registered home-based businesses are owned by women.

Gender Mashreq Facility,
<https://www.worldbank.org/en/programs/mashreq-gender-facility#3>

³⁷⁸ World Bank Group (2019) 'Women's Economic Empowerment Action Plan'
<http://pubdocs.worldbank.org/en/379131574445136942/pdf/Jordan-WEEAP-Jan-19-2019-en.pdf>

³⁷⁹ Jordan Energy Strategy (not available online)

³⁸⁰ JEDCO, Women entrepreneurship in Jordan (2017), file:///C:/Users/reem-abdel-Hadi/Downloads/women-entrepreneurship-in-jordan-2016-2017-women-empowerment-1531905992.pdf

³⁸¹ Mashreq gender report <http://documents1.worldbank.org/curated/en/933641600751429640/pdf/Middle-East-and-North-Africa-Women-s-Economic-Participation-in-Iraq-Jordan-and-Lebanon.pdf>

Women’s economic participation by sector: Highly educated women in Jordan tend to work in just a few sectors, and that these sectors tend to have a set of “socially acceptable characteristics”³⁸²:

- **Education, health, and public administration** together represent 74% of employment for Jordanian women with a university degree.
- As women gain further education, the concentration of female employment in the three sectors increases even further to 81%.
- These three sectors represent just **30% of overall employment** in Jordan.

It would be expected that the high level of schooling and skills attained by Jordanian women would open a more diverse set of occupations for them in the labour force, but this has clearly not been the case. When looking at occupations (see Figure 2-1):

- 45% of employed Jordanian women with a university degree work as teachers.
- The share of female employment in education is unusually high compared to the region. In 2017, only 23% of women in Arab States were employed in education, which was itself the highest share among all regions in the world (ILO, 2017).

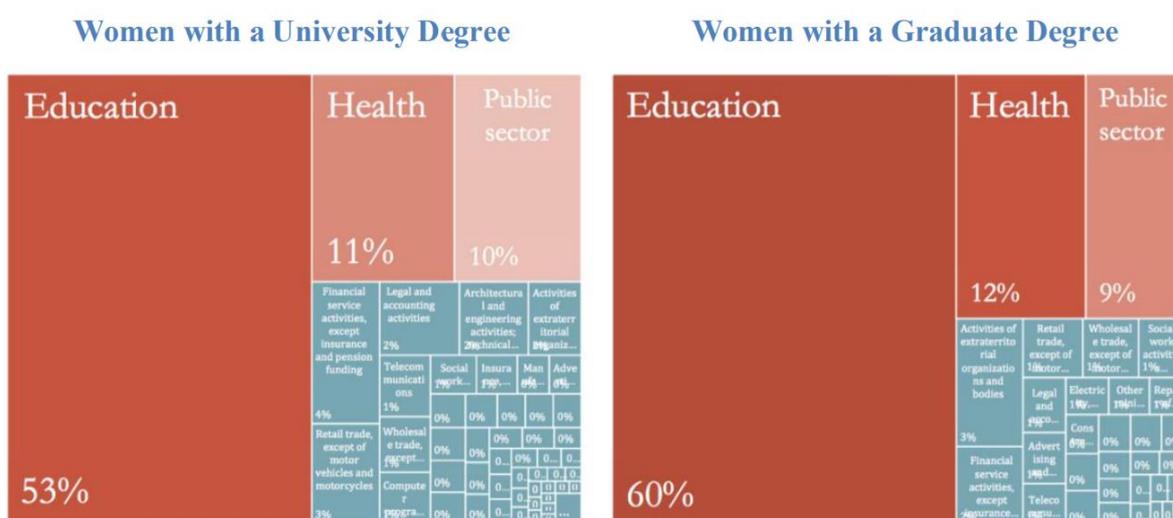


Figure 2-1: Highly educated Jordanian women’s employment by industry

Source: Kasoolu et al. (2019)³⁸³

There is also a significant difference between Jordanian women and foreign working women in Jordan, who have self-segmented into very different types of jobs (Figure 2-2): 71% of foreign working women are engaged in household activities, and 50% of foreign men work in construction, wholesale and household activities, while 68% of all Jordanian women work in health, education or public administration. There is little overlap in the areas where Jordanian women and non-Jordanians work. The largest overlap is in manufacturing, which is a small segment of overall employment among each group³⁸⁴.

Lastly, several sectors – including finance and insurance, information and communications technologies, professional, scientific and technical services, and arts, entertainment and recreation – have a proven track record of employing Jordanian women, but which nevertheless remain small (Figure 2-3). These sectors also tend to pay higher than average wages and generate exports.

³⁸² Female Labor in Jordan: A Systematic Approach to the Exclusion Puzzle (2019)

<https://growthlab.cid.harvard.edu/files/growthlab/files/2019-10-cid-wp-365-female-labor-jordan.pdf>

³⁸³ Kasoolu, S., Hausmann, R., O’Brien, T. and Santos, M.A. (2019) Female Labor in Jordan: A Systematic Approach to the Exclusion Puzzle (2019) <https://growthlab.cid.harvard.edu/files/growthlab/files/2019-10-cid-wp-365-female-labor-jordan.pdf>

³⁸⁴ Kasoolu, S., Hausmann, R., O’Brien, T. and Santos, M.A. (2019) Female Labor in Jordan: A Systematic Approach to the Exclusion Puzzle (2019) <https://growthlab.cid.harvard.edu/files/growthlab/files/2019-10-cid-wp-365-female-labor-jordan.pdf>

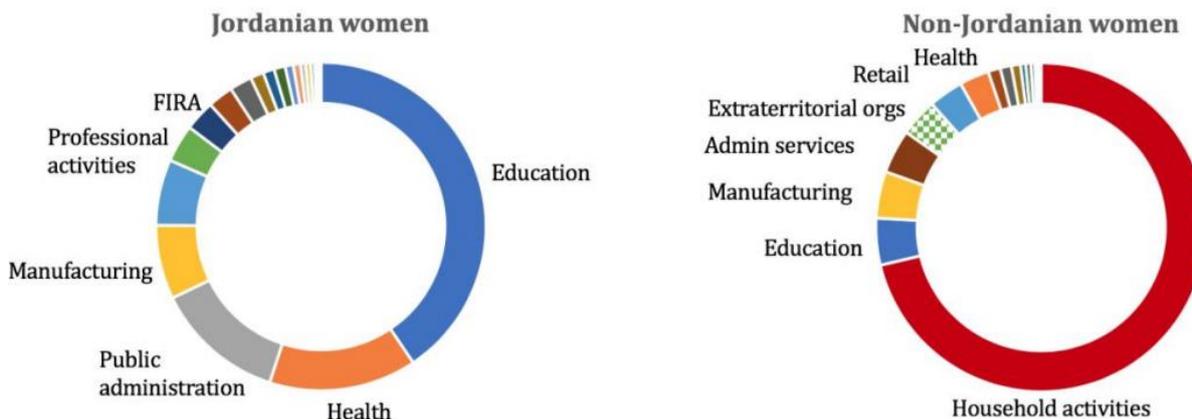


Figure 2-2: Employment of female Jordanian and Non-Jordanians by Sector

Source: Kasoolu et al. (2019)³⁸⁵

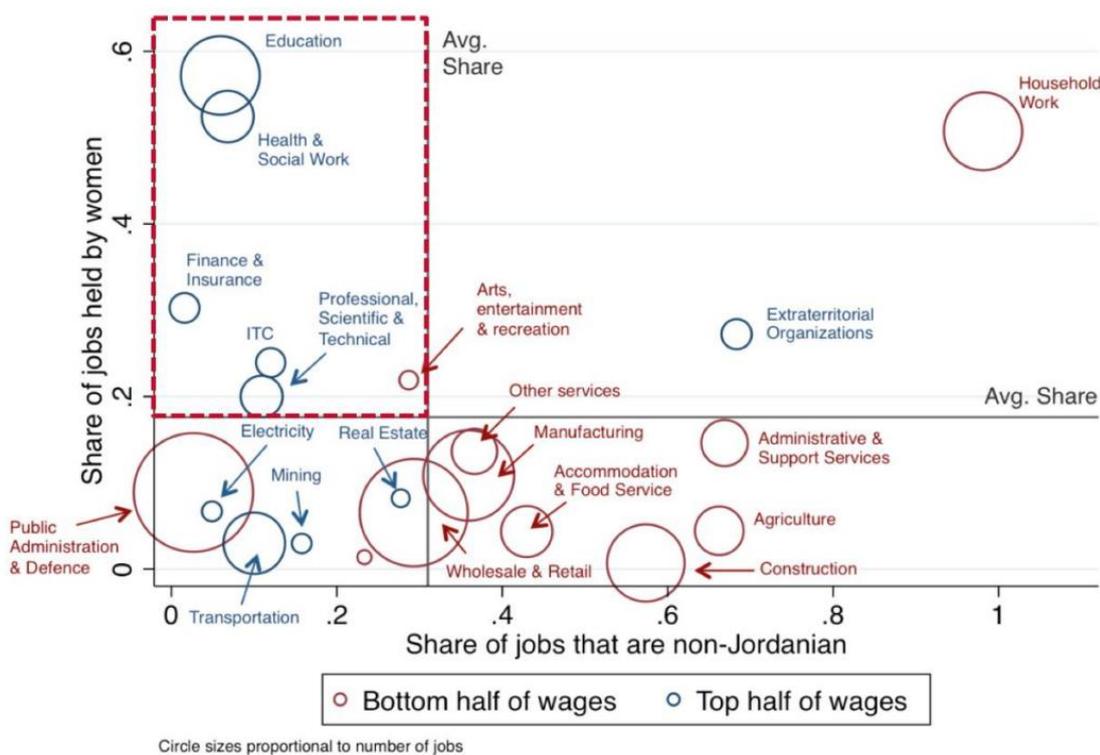


Figure 2-3: Employment of female Jordanian and Non-Jordanians by Sector

Source: Kasoolu et al. (2019)³⁸⁶

³⁸⁵ Kasoolu, S., Hausmann, R., O'Brien, T. and Santos, M.A. (2019) Female Labor in Jordan: A Systematic Approach to the Exclusion Puzzle (2019) <https://growthlab.cid.harvard.edu/files/growthlab/files/2019-10-cid-wp-365-female-labor-jordan.pdf>
³⁸⁶ Kasoolu, S., Hausmann, R., O'Brien, T. and Santos, M.A. (2019) Female Labor in Jordan: A Systematic Approach to the Exclusion Puzzle (2019) <https://growthlab.cid.harvard.edu/files/growthlab/files/2019-10-cid-wp-365-female-labor-jordan.pdf>

2.3 Opportunities

Clean energy and climate change adaptation interventions provide a large opportunity for employment of females:

- The energy sector has been historically important to job creation, as large numbers of workers are needed to explore and extract fuel sources. Studies show that in the future, significant opportunities for job creation also exist in the renewable energy and energy efficiency sectors.
- Globally, 11 million people were employed in the sector worldwide in 2019, compared with 10.3 million in 2017. Solar PV tops the list followed by bioenergy, hydro, and wind power industries.

A gender-informed approach can result in more effective and equitable low emissions development pathways:

- Women's and men's choices can be expanded in ways that reduce carbon footprints, through gender-sensitive approaches to the design and distribution of improved cook stoves, advice on low-tillage agriculture, or product labelling and recycling, among many other examples.
- The strengthening of women's political representation and leadership roles within wider society is likely to contribute to the kinds of institutional transformation that are required to put countries on low-emissions development paths³⁸⁷.

Womens' leadership for enhancing climate resilience: Women play key roles in contributing to household food and livelihood security, managing climate-sensitive resources and in community organization and leadership.

- Empowerment of women is an important ingredient in building climate resilience, and there are countless examples where empowering women to exercise leadership within their communities contributes to climate resilience.
- There is also strong and mounting evidence at the country level that improving gender equality contributes to policy choices that lead to better environmental governance, whether through increased representation and voice of women within their communities, in society at large, and at the political level, or through increased labour force participation.
- Equitable participation of women in planning, implementation and monitoring and evaluation (M&E), taking into consideration gender roles is essential to optimize the efficiency of this strategy and avoid any unintended negative consequences.
- With women being the most vulnerable to natural threats, their engagement in climate change adaptation initiatives is essential. It is also expected that women's involvement in soil and water conservation, damming flood water and other non-agricultural activities would considerably enhance the efforts necessary to address climatic hazards³⁸⁸.

2.4 Jordan's commitments to gender equality:

Jordan is a signatory to and member of several key international agreements that already commit the country to use a comprehensive gender tag approach that addresses existing inequalities, Jordan was the first Arab country to include gender mainstreaming as one of the adaptation priorities in the Third National Communication on climate change, submitted to the UNFCCC in 2010, acknowledging women's effective role and allowing women's empowerment to provide a vital role in addressing climate resilience.

Under the UNFCCC, increased attention is paid to securing a gender perspective in international policies and initiatives. Gender equality is also at the centre of the SDGs, as both a stand-alone goal and a cross-cutting issue across a number of other goals to be reached by 2030 (United Nations,

³⁸⁷ World bank, 2011, Gender and climate change, three things you should know, Washington DC

³⁸⁸ IUCN & UNDP. Training Manual on Gender and Climate Change, 2009 <https://www.iucn.org/content/training-manual-gender-and-climate-change-0>

2015). These commitments represent a strong statement to the global community that gender equality is a priority.

3 Achievements to date

Jordan was the first Arab country to develop a gender and climate change strategy. What was accomplished in the past 10 years? What was the overarching goal that was set in relevant international and national action plans?

In June 2010, Jordan was the first Arab country to develop a gender and climate change strategy. Following the development of the ccGAP, the Jordanian National Commission for Women (JNCW) continued to include environment and climate change in the National Women's Strategy including the recent strategy 2020-2025. Gender was also expressed as a national priority in the context of climate change and as part of the enabling activities for the preparation of Jordan's National Communication to the UNFCCC.

Based on reviewing Jordan Vision 2025, Green Growth National Action Plan 2021-2025, Agriculture development strategy 2020-2025, Jordan economic growth plan 2018-2022, Energy plan 2020-2030, and Amman Climate Plan: A Vision for 2050. The common overarching goal on gender equality was related to ensuring women have **access to, participate in, contribute to and benefit from** climate change initiatives, programs, policies and funds in addition to enhancing women's economic participation.

3.1 Setting a vision

In line with the common overarching goal of other climate related national plans and commitments, the LTS vision should ensure that national climate change efforts in Jordan use a comprehensive gender tag approach that identifies gender gaps and inequalities, design interventions to address these gaps and a monitoring and evaluation system to track progress made so that women and men can have access to, participate in, contribute to and hence optimally benefit from climate change initiatives, programs, policies and funds. Additionally, enhancing women's economic participation through investing in clean energy job creation and preparedness of women and girls to enter these work fields, to support the national vision of increasing women's economic participation to 24%.

3.2 Lessons learnt

A gender-responsive approach was defined by the NAP Global Network as those that examine and actively address gender norms, roles and inequalities³⁸⁹. Gender-responsive approaches go beyond sensitivity to gender differences— it actively seeks to promote gender equality³⁹⁰, often through specific actions to empower women in their households and communities as well as broader policy and planning processes³⁹¹.

As a result of adopting a gender sensitive approach, the following best practices, lessons learned and accomplishments were achieved:

- Gender is recognized as a factor that influences vulnerability to climate change and as a cross-cutting issue for climate resilience action plans.
- The Ministry of Environment played an overall coordinating role by outlining clear mandates to each line ministry and where technical support is required. Coordination involved a wider group of cross-sector non-government stakeholders, including academia, civil society organizations and private entities, thereby facilitating communication and exchange of ideas.

³⁸⁹ WHO (2009). Integrating gender into HIV/AIDS programmes in the health sector: Tool to improve responsiveness to women's needs. https://www.ncbi.nlm.nih.gov/books/NBK143049/pdf/Bookshelf_NBK143049.pdf

³⁹⁰ CARE & International Center for Research on Women (ICRW) (2007). Inner Spaces Outer Faces Initiative: Tools for learning and action on gender and sexuality. http://www.care.org/sites/default/files/documents/MH-2008-ISOFI-Toolkit_2008.pdf

³⁹¹ Burns, B. & Lee, A. (2015). Gender mainstreaming practices in the context of climate responses (Draft background paper). Women's Environment and Development Organization (WEDO). <http://wedo.org/wp-content/uploads/2016/08/Gender-mainstreaming-practices-in-the-context-of-climate-responses.pdf>

- More funding and resources were channelled for enhancing gender equality in projects including gender-responsive mitigation and adaptation plans.
- Various projects were implemented providing support to rural women and small and medium sized farmers to access advanced greenhouse technology.
- Various research papers and studies were conducted in the past ten years to better understand the importance of gender in climate change resilience including papers by WANA, UNDP, World Bank, UN Women, USAID, EU and Dutch Embassy among others to support women in rural areas.
- There have been efforts to improve access to finance in rural areas.
- Guidance and tools were developed to support inclusion of women in rural areas.
- Most of the capacity building projects implemented in rural areas ensured targeting of women as well as men.

4 Challenges and bottlenecks

What are the current challenges and bottlenecks hindering the progress towards the aspired gender equality goals set in current international and National strategies related to climate change?

Jordan's NAP and INDC presents a framework for adaptation and mitigation actions that requires the implementer to take gender into consideration, but provides limited details on how to do that and the steps to follow. This includes further prioritization of adaptation actions, implementation approaches and allocation of finance and other resources. This makes it difficult to assess the extent to which gender aspects will be a consideration as the process moves forward based on the existing documents. Challenges can be summarized as follow:

- The national plans and strategies mentioned above provide a general guideline for gender mainstreaming but don't propose concrete and measurable steps.
- Lack of data collection to measure the impact of implementing these strategies (number of jobs created through investment in clean energy/ Number of male/females employed/ Number of women and men trained on adaptation and mitigation measures/ Investment in educating rural women in income generating activities
- Measuring the impact of funding opportunities that invest in raising awareness among women on mitigation and adaptation processes
- Ministry of environment annual report doesn't include sex disaggregated data and do not provide data on the progress of gender equality policy.

5 Recommendations

Moving forward, more emphasis on gender is needed in Jordan, particularly on progress in implementation, financing and communication strategies as well as M&E systems for climate change, identifying opportunities to narrow inequalities and deciding on the approach to be taken. To enable this to occur, further capacity building is needed, engagement of different stakeholders and tracking of progress on this issue at the international level. This segment provides three levels of recommendations or opportunities for the LTS development process: Pre design stage, design stage (Strategic), post design (Implementation).

Step	LTS Elements & processes
Pre-design stage Month 0-6	<p><i>Institutional coordination</i></p> <p>A mechanism for coordination of efforts aiming to engage women in mitigation and adaption of climate resilience: a gender taskforce</p> <p>A taskforce from gender focal points of relevant public entities, IMC, JNCW along with representatives of civil society organizations, donors and private sector should have regular</p>

<p>Design stage – strategic Month 6-18</p>	<p>meetings to ensure implementation of policies and sharing knowledge about relevant projects and opportunities.</p> <p>As an immediate action and recommendation for the LTS, the Ministry of Environment can invite the above-mentioned stakeholders to nominate gender focal points to form a gender taskforce.</p> <p>This taskforce could be coordinated by JNCW or possibly the Royal Scientific Society (or on collaboration), and further coordination can be made with existing working groups on SDGs Climate Change and Gender.</p> <p>This Task force will be responsible for incorporating gender responsiveness in the development of the LTS (including ensuring it is embedded in the vision, climate pillars, actions and criteria for determining actions for example)</p> <p>Initial Capacity Building</p> <p>Capacity building on Monitoring and Evaluation for the gender taskforce and for the technical task team and other relevant stakeholders</p> <p>To include gender sensitive indicators and sex disaggregated data, and on gender sensitive messaging for communications plans. This ensures the LTS development process and its technical teams are fully aware of the opportunities and needs.</p> <p>Ongoing Capacity Building</p> <p>Build capacity at all levels to design and implement gender responsive climate change policies, strategies and programs.</p> <p>There are many existing manuals that could be utilized for a Training of Trainers (ToT) on gender and climate change. Capacity building should be conducted at three levels</p> <ol style="list-style-type: none"> 1. Policy makers and GOJ Officials on gender and climate change adaptation and mitigation. 2. CSOs, CBOs and Community Leaders promoting gender equality and/ or women’s interests in climate change resilience - a ToT is recommended for this category to take forward awareness sessions in the various communities creating agents of change. 3. Private sector – capacity building on the importance of inclusion of women in climate change related financing and investments. <p>A good manual recommended is the gender and climate change training manual that was translated to Arabic by Arab Women Organization and the IUCN-West Asia office, a link provided below³⁹².</p> <p>Another example is a training manual published by WANA institute³⁹³.</p>
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³⁹² Arab Women’s Organisation of Jordan, Training Manual on Gender and Climate Change (2011)

<https://www.awo.org.jo/ar/2020/03/18/%D8%AF%D9%84%D9%8A%D9%84-%D8%AA%D8%AF%D8%B1%D9%8A%D8%A8%D9%8A-%D8%AD%D9%88%D9%84-%D8%A7%D9%84%D9%86%D9%88%D8%B9-%D8%A7%D9%84%D8%A7%D8%AC%D8%AA%D9%85%D8%A7%D8%B9%D9%8A-%D9%88%D8%A7%D9%84%D8%AA%D8%BA/#> or <https://www.awo.org.jo/2019/10/14/training-manual-on-gender-and-climate-change-2011/>

³⁹³ http://wanainstitute.org/sites/default/files/files/Feda'a_21st.pdf

Capacity Building could be provided by the Technical Task Force.

Knowledge sharing

A climate and gender portal to provide access to key information to inform LTS development

Information sharing of best practices, impact studies, practical tools, information, data and guidelines of how to best implement gender sensitive mitigation and adaptation plan and integration of gender into policy and programming (compiling, dissemination and knowledge sharing portal through the Ministry of Environment)

In addition, identifying key actors on gender equality in climate mitigation and adaptation and sources of gender expertise within the country as entities or individuals.

Strategy and action development

Gender Assessment Method for Mitigation and Adaptation (GAMMA) for use in assessing climate actions

The GAMMA methodology permits to examine local adaptation and mitigation policies for their gender responsiveness, seeking to identify gender entry-points and develop recommendations for interventions needed to address gender gaps in planning procedures, priorities, policies, and measures.

It sets 8 indicators for evaluating the institutional setting and processes:

1. Climate change integration into planning, consideration of gender issues
2. Mainstreaming of climate change and gender into policies & institutions
3. Budgeting and finance for gender-responsive climate policies & measures
4. Institutional capacity on climate change & gender
5. Collection and use of data and climate information
6. Integration of socio-economic aspects
7. Awareness among key actors and communication
8. Participation

MRV - Evidence and data

Sex-disaggregated data and gender information: establish a tracking system for climate resilience interventions and ensuring data collected is at least sex and age disaggregated.

As part of the MRV and tracking system for the LTS and sectoral implementation plans. Indicators selected to track impacts of actions could include, for instance:

- Number of jobs created through investment in clean energy
- Number of male/females employed
- Number of women and men trained on adaptation and mitigation measures
- Investment in educating rural women in income generating activities

This can be delivered by:

<p>Post-design stage (implementation)</p>	<ul style="list-style-type: none"> • Involving gender experts in development of M&E frameworks • Evaluating the differentiated impact of adaptation actions on women and men <p><i>Institutional coordination</i></p> <p>Formation of permanent gender taskforce structure and functions</p> <p>Following the publication of the LTS the gender taskforce can be embedded in the institutional structure. This could ensure, for examples, there is tracking of gender responsiveness in the implementation of this LTS and provide gender and climate input for international reports such as NDCs and SDGs National Reports among others.</p> <p>This taskforce could also take forwards the below recommendations on capacity building and technology and develop an annual work-plan for implementation of these recommendations.</p> <p><i>Dedicated financial resources and gender responsive budgeting</i></p> <p>Ensuring that financing mechanisms on mitigation and adaptation address the needs and conditions for implementation of women and men equally and pay attention to more vulnerable groups.</p> <p>This could be achieved through ensuring:</p> <ul style="list-style-type: none"> • Gender equality considerations as a funding requirement for CBOs/ CSOs seeking funding for mitigation and adaptation projects. • Practicing gender-responsive budgeting by allocating resources that addresses the needs of women and vulnerable groups. • Ensuring allocation of resources for adaptation, including finance, is gender-equitable. <p><i>Education and outreach</i></p> <p>Awareness raising, capacity building and strengthen of rural women and men to communicate and respond on climate change</p> <p>Drawing on findings from other studies³⁹⁴, actions could include:</p> <ul style="list-style-type: none"> • Building on rural women’s existing expertise and ability to communicate to develop a common understanding of key climate change processes, such as through education and training; exchanging of experiences; and strengthening community networks; strengthening NGOs and empowering schools and universities. • Fostering Jordanian rural women’s capacities to act and make significant progress in adapting to climate change in their communities, such as through developing new programming, tools and incentives and funding, and strengthening scientific research capacities.
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³⁹⁴ UN Women, Rural women and climate change in Jordan <https://jordan.unwomen.org/en/digital-library/publications/2018/rural-women-and-climate-change-in-jordan>

	<ul style="list-style-type: none"> • Strengthening rural women’s leadership capacities to advocate for gender sensitive strategies of adaptation to climate change. <p>Technology access and investment</p> <p>Providing access to advanced technologies to less advantaged and vulnerable groups including women and girls in remote areas.</p> <p>These will need to be embedded in sectoral strategies and implementation plans. Examples include:</p> <p>Energy</p> <ul style="list-style-type: none"> • Providing access to clean energy technologies, solar panels among other for less advantaged and vulnerable groups including women and girls in remote areas. • Invest in information sharing and training of young girls and boys on innovation in using clean energy, use of recycled material and environmental technologies to prepare them for the job market. <p>Agriculture and water</p> <ul style="list-style-type: none"> • Access to new crops and modern technologies for efficient energy and water use for vulnerable groups and women and girls in rural areas. • Awareness on flexible crop planning and variety selection methodology and decision-making process based on crop-per-drop and economic competitiveness. • Promoting the development of organic agriculture through knowledge exchange and market development particularly in rural areas. <p>Waste</p> <ul style="list-style-type: none"> • Awareness and access to information on waste management, recycling and composting in under-privileged rural areas.
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6 Expected Results Outcomes

The following longer-term actions and opportunities are identified that could be realised as a result of an LTS for Jordan that is gender sensitive:

6.1 Economic empowerment

Closing the gender gap in the energy sector can significantly contribute to a greater participation of women in the labour market. Globally, 32% of workers in the sector are women. Comparatively, 22% of workers in oil and gas are women, indicating that women are more attracted to the opportunities in the sustainable energy sector.

A multifaceted approach is needed to bring more women into the sector, including supporting women in STEM related educations and removing existing barriers to entering the workforce, and advancing their careers.

Successful approaches will broaden the talent base in the sector, and contribute to the overall socio-economic co-benefits associated with women’s empowerment and gender equality. For example, of

Jordan’s annual GDP would grow by 5% if women’s participation in the labour market reaches 24% according to Jordan Vision 2025 plan.

the clean technology jobs in 2016 referenced above, only 18% are held by women. Removing the barriers to women's entry and career development in the sector could create an opportunity to close the gender gap in the labour force and, most importantly, also leverage the talent of STEM educated women in Jordan.

In line with the Mashreq Gender Facility (MGF) Pillars on gender responsive private sector and entrepreneurship, support for home-based businesses particularly in businesses relevant to green energy and the ease of registration procedures is crucial to increase women's economic participation.

6.2 Policy alignment

Clean energy and climate change mitigation creates an opportunity for job creation and for increased employment and engagement of women in the job market. Therefore, policies that enhance the ability of Jordanian firms and the private sector entities working in the fields of green economy, clean energy, agriculture and water saving technologies should be a top priority. Echoing the recommendations of World Bank's "Jordan's economic monitor weathering the storm", such policy alignment may include:

- Removing legal and regulatory impediments to more integrated labour markets to reduce labour market segmentation and improve labour force participation rates.
- Improve the business environment, especially for young firms, so that they can grow and create jobs
- In line with MGF workplan, policies on flexible work arrangements, equal pay and satellite work modalities can help increasing women's economic participation.
- Easing the procedures in registration of home-based businesses.

Other opportunities for policy alignment include:

- Integrating gender considerations and the interest of vulnerable group in climate change policies and strategies in all relevant sectors particularly in national strategies for social development, poverty eradication, childhood and early childhood development in Jordan.
- Ensuring the equal participation of men and women in decision-making and implementation around adaptation and mitigation.
- Promoting mitigation approaches that are aware of gendered implications and outcomes and working towards gender equality and positive impacts on the lives of women through improving livelihoods and health and allowing time for the pursuit of additional opportunities.
- Developing resource mobilization strategies, applying climate finance instruments, and ensuring equal participation in the deployment of financial resources, particularly at the local level.

7 Further Resources

- Wana - Program for Mainstreaming Gender in Climate Change Efforts in Jordan
- 46 The National Climate Change Policy and Sector Strategic Guidance Framework of the Hashemite Kingdom of Jordan (2013-2020)
- IRENA. "Renewable Energy and Jobs Annual Review," 2019.
- International Union for Conservation of Nature (IUCN)
- United Nations Framework Convention on Climate Change (UNFCCC)
- gender-sensitive Climate Action Plan (ccGAP)
- National Adaptation Plan (NAP)

Annex 8 – MRV System for Tracking the Implementation of the LTS

1 Tracking progress towards a target

Before considering the specific needs of an MRV system for Jordan's LTS, it is helpful to first consider the general needs of a tracking system towards a policy target, for which other purposes than the LTS such a system might be required and to which extent such systems have already been built in Jordan.

1.1 Tracking system needs

Generally, any tracking system for a policy target (e.g. for a climate-related target) needs to support the policy cycle (see Figure 1-1).

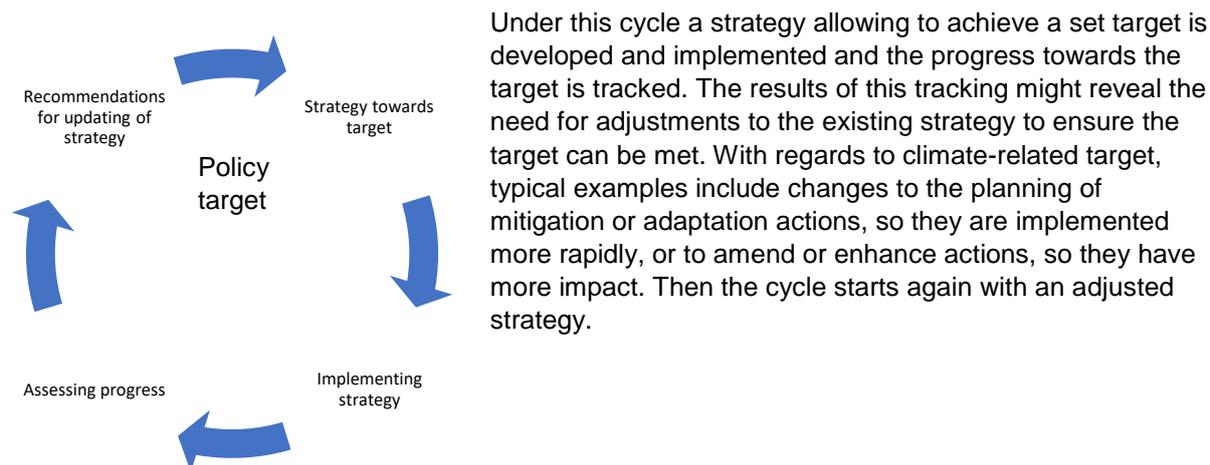


Figure 1-1 The policy cycle

Source: Developed by Ricardo Energy and Environment

Tracking systems support the following steps of the cycle:

- a) Assessing progress, consisting of the following sub steps:
 - Collection of data and calculation of indicators³⁹⁵
 - Reporting of indicators for evaluation purposes
 - Evaluation of indicator data
- b) Developing policy recommendations as appropriate (depending on progress achieved).

Summarising, we could say that tracking means collecting and assessing evidence of progress to target, thus supporting taking appropriate action where progress is not as desired. The evidence of progress is collected in the form of so-called indicators. Indicators are, among other, a means to show whether a set objective has been reached, what progress towards that target is made and potentially also why that is the case. By doing so, they can also help planning additional / improved action necessary to reach the set objective. In order to allow doing so, indicators have to be clearly related to that objective.

As a general rule, an indicator consists of three elements:

- An objective or target, i.e. the value (if quantitative) or situation (if qualitative) one strives to reach
- A baseline, a counterfactual value (if quantitative) or situation (if qualitative). This could be what happens if a climate-related measure does not take place.

³⁹⁵ In some cases, data collected already constitutes the indicator (e.g. heads of cattle) without any further steps (e.g. calculation) needed. In other cases, the indicator relies on several data inputs and requires calculation (e.g. GHG emissions from electricity generation in CO₂-eq, deep fertilizer use in rice production in t/ha) to compile the indicator.

- The indicator value, i.e. the actual development that is measured, calculated or described.

Not all indicators use a baseline value, e.g. where an absolute target value / situation has been set. The baseline is of particular relevance where the objective is defined in relation to the baseline, e.g. reducing GHG emissions by 25% below the Business-As-Usual value.

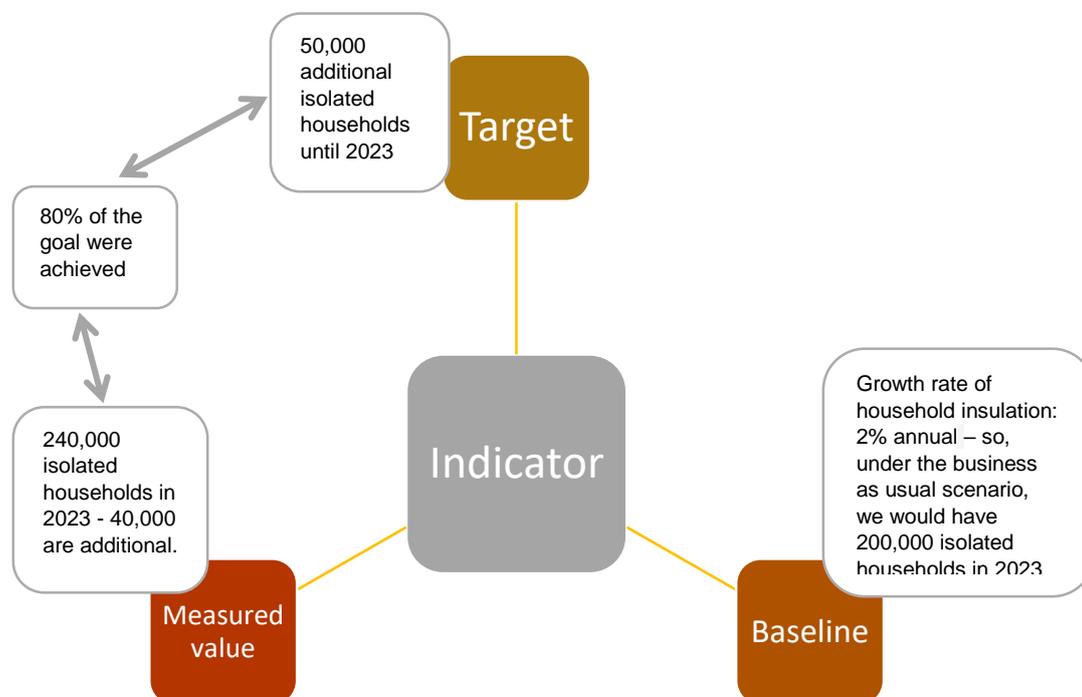


Figure 1-2 Indicator example

Source: Developed by Ricardo Energy and Environment

To allow meaningful tracking of progress towards an objective, both objective and indicator need to be SMART (see Figure 1-3).

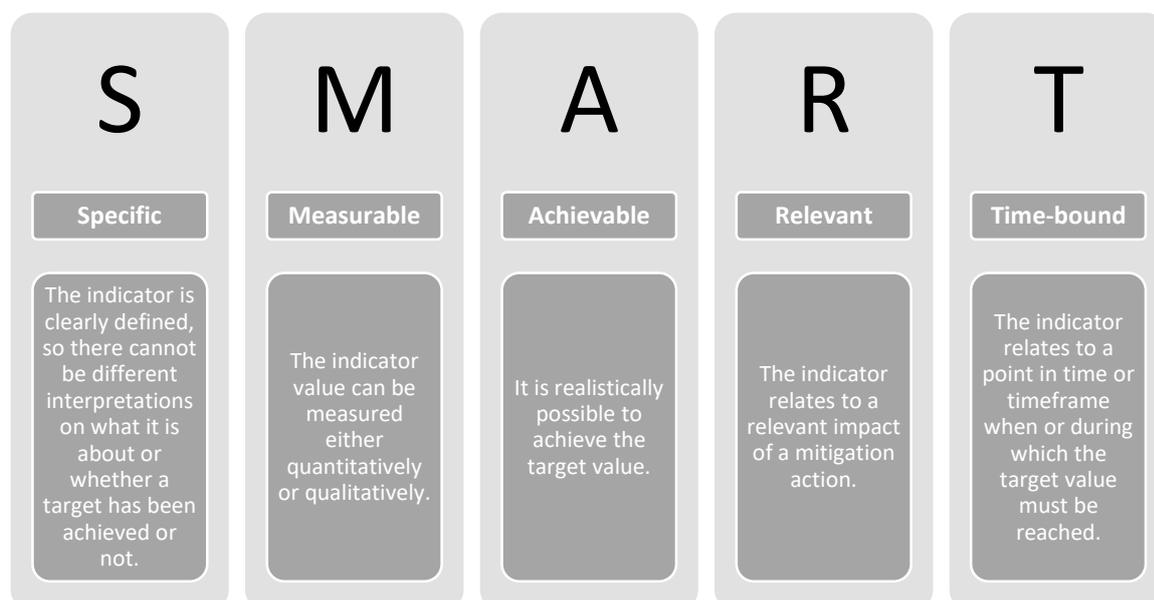


Figure 1-3: The SMART concept

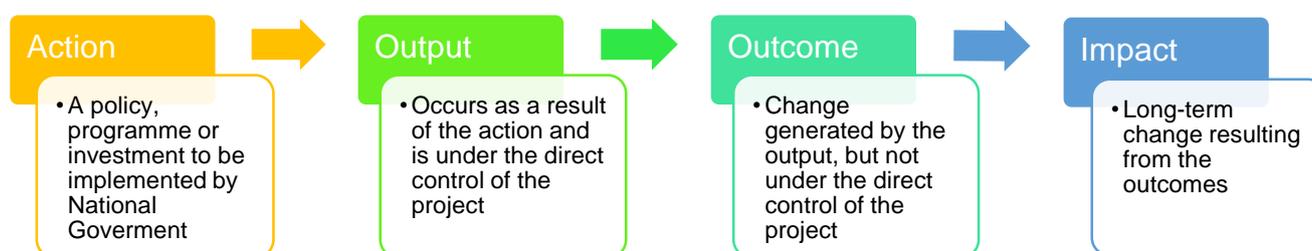
1.2 Identifying indicators

How can relevant indicators for progress tracking be identified, particularly for broader long-term targets as in Jordan’s LTS vision?

In the above, we already indicated that there is a close relationship between the objective set and relevant indicators. An approach well-known from development interventions, the intervention logic framework, can be very useful for the identification of indicators for changes, which might only occur in the longer term.

The intervention logic framework is a tool which helps to better understand how an activity, e.g. a development intervention or a climate policy leads to change in the form of “cause and effect” relationships. First, anticipated outputs resulting from the action to be taken are identified. Outputs are considered to be under the direct control of the project. The Outputs are in turn considered to lead to further changes, referred to as outcomes, which also need to be identified. These are considered to result from an action, but are not under its direct control. Finally, long-term changes resulting from these outcomes – referred to as “impacts” are identified. (see Figure 1-4).

Figure 1-4: Intervention Logic Chain



Source: Developed by Ricardo Energy and Environment

This assessment can be conducted in both directions. Not only can different types of changes potentially resulting from an action be assessed, but starting the process from the impact (e.g. a theme from the LTS vision or an element of a theme) and working backwards, it is also possible to identify relevant actions allowing to achieve a given impact.

Table 1-1 below presents simplified intervention logics for a number of mitigation and adaptation actions.

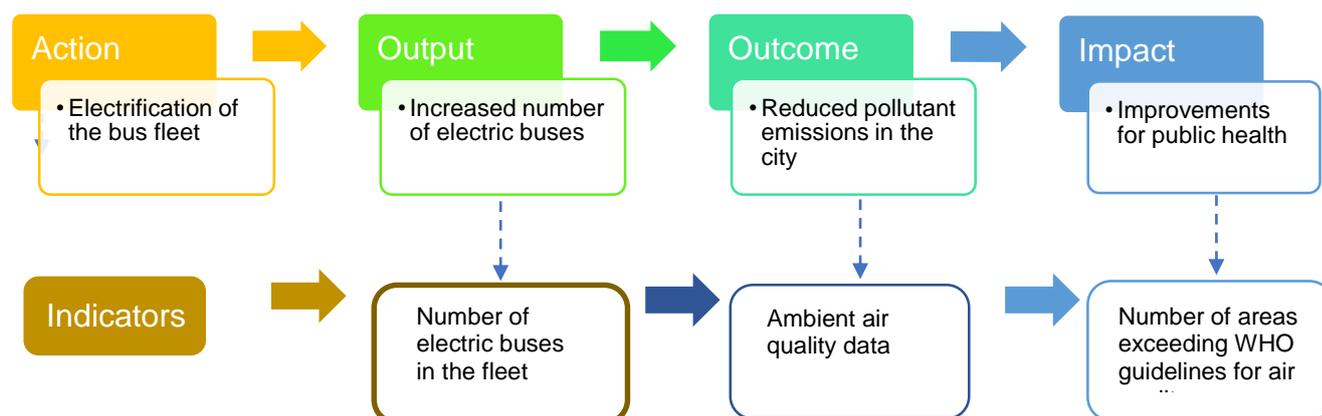
Table 1-1: Illustrative intervention logic for a number of mitigation and adaptation actions

	Action	Output	Outcome	Impact
Public transport	Electrification of the bus fleet	Increased number of electric buses	Reduced pollutant and noise emissions in the city	Improvements for public health
Waste management	Construction of a sanitary landfill with gas capture	Increased tonnages of waste disposed to sanitary landfill	Reduced open dumping of waste and waste burning	Improvements for public health
Renewable energy	Installation of rooftop solar PV	Increased electricity generation from solar PV	Reduced consumption of solid fuels	Improvements for public health, reduced deforestation

	Action	Output	Outcome	Impact
Rainfall	Conversion of recreational and open spaces to water squares and parks	Additional water retention area	Reduction of floods due to rainfall	Reduced exposure to flooding
Storm surge/ Sea Level Rise	Install flood gates	Floodgates installed	Reduced storm surge flooding	Reduced exposure to flooding
Heat Waves	Increase shade in public areas	Shading structures installed	Moderated temperatures	Reduced exposure to heatwave
Drought	Rainwater Harvesting	Rainwater collection system installed	Increased water availability	Reduced vulnerability to drought

Once the intervention logic has been mapped out, indicators can then be identified to track changes in the different levels, i.e. the outputs, outcomes and impact. For example, electrification of the bus fleet, potential indicators may include the number of electric buses in the fleet, which may be available from the transport authority or bus operators, data on ambient air quality, which may be collected by the city's environmental team, and data on improvements in public health. In this example, these indicators in isolation may not tell the full story, however, by collecting data on all aspects, correlations can be made between the change in the type of buses being used, reductions in pollutant concentrations, and changes in public health metrics.

Figure 1-5: Illustrative mitigation example of the intervention logic chain in relation to public transport



Source: Developed by Ricardo Energy and Environment

2 Building an MRV system for Jordan's LTS

Building an MRV system for Jordan's LTS can be broken down in two key steps:

- Selecting sets of appropriate indicators
- Establishing processes for the collection and evaluation of these indicators.

These steps are addressed in the following subsections.

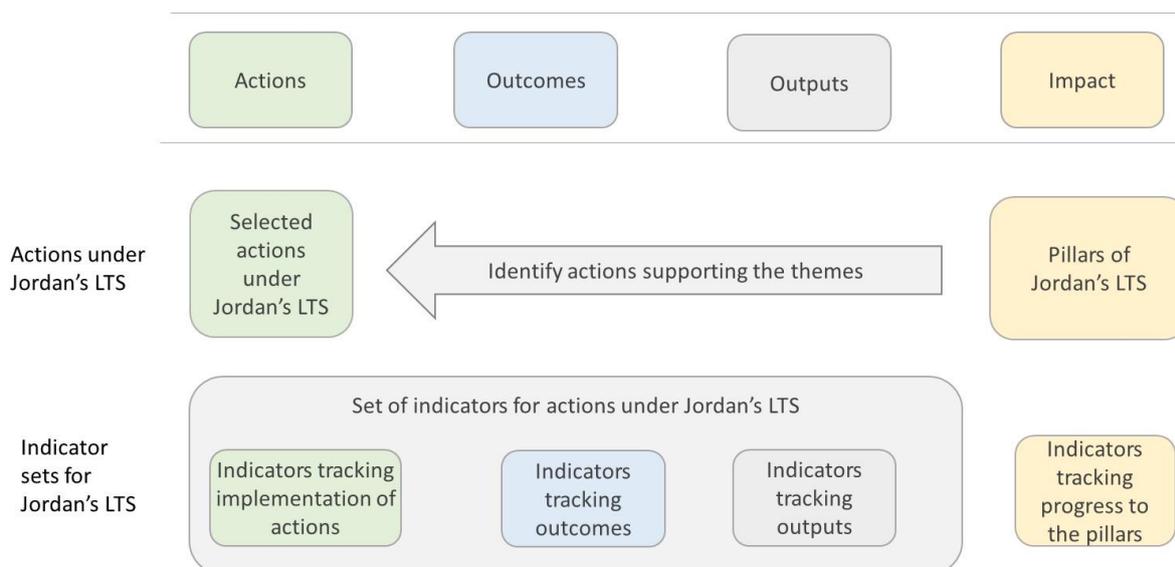
2.1 Selecting indicators for Jordan's LTS

How can indicators for tracking Jordan's LTS be identified? This could be done by using the logical framework concept and considering the suggested pillars of Jordan's LTS as impacts. Under the project, potential actions supporting the various themes of the LTS are suggested as well as stakeholder engagement approaches for the selection of measures. Indicators could be selected for:

- The pillars of the LTS (impacts)
- The selected actions under the LTS, i.e. their implementation, their outcomes and their outputs.

Figure 2-1 illustrates this approach.

Figure 2-1 Identifying indicator sets for Jordan's LTS



Source: Developed by Ricardo Energy and Environment

Actions under Jordan's LTS remain to be selected and the pillars of the LTS fully agreed, i.e. the LTS has not yet been elaborated. Once this has happened, indicators related to the selected actions (implementation, output, outcome) and the pillars can be selected. The indicators would need to cover ideally all relevant aspects of the pillars, including in the areas energy, water, transport, agriculture, forestry, coastal areas, tourism, gender, equality. It is likely that not all indicators can be collected from the start and/or with the same frequency. Indicators would thus need to be prioritised to identify those to be collected early on and with higher frequency, e.g. annually.

Table 2-1 presents examples for indicators for two of the currently suggested pillars of Jordan's LTS.

Table 2-1 Exemplary indicators for two suggested pillars of Jordan's LTS

No	Pillar	Illustrative list of indicators
1	Enhancing sustainability and resilience of water supply and access through greater efficiency and enhanced water supply and treatment infrastructure	<ul style="list-style-type: none"> • Water storage per capita (m³ per capita) • Renewable water resource availability per capita per annum (m³ /capita/a) • Power consumption for water pumping and treatment • Share of population connected to wastewater treatment infrastructure [%] • Share of population with access to safe drinking water [%]
2	Improving food security through enhancing the resilience and productivity of agriculture	<ul style="list-style-type: none"> • Percentage of arable land (to the land area) • Area of Land under erosion control measures and used optimally • Number of hectares efficient irrigation technologies • Percentage of farmers adopting resilient crop/ varieties

Over time, the needs of a country might change and so an existing LTS might become less relevant for the country. Evaluating from time to time whether the LTS as such still reflects Jordan's needs is thus a further step to be considered. Such assessments can take place in longer intervals, e.g. every 5 years. Where an LTS is adjusted, this might also require adjustment of indicators for enhanced or even new pillars and the indicator sets for the similarly adjusted actions supporting these pillars. Transparently documenting the considerations, of why an adjustment is necessary and how relevant actions need to be adapted and/or enhanced as well, will help conduct future assessments more efficiently.

2.2 Establishing systems and processes for the collection and evaluation of the LTS indicators

Systems and processes need to be put in place to enable the collection and evaluation of the LTS indicators, so insights from the tracking can lead to policy recommendations. Ideally, this is done by building on existing systems and processes to the extent feasible. This subsection explores, to which extent the LTS indicators could be integrated into Jordan's multi-level MRV system.

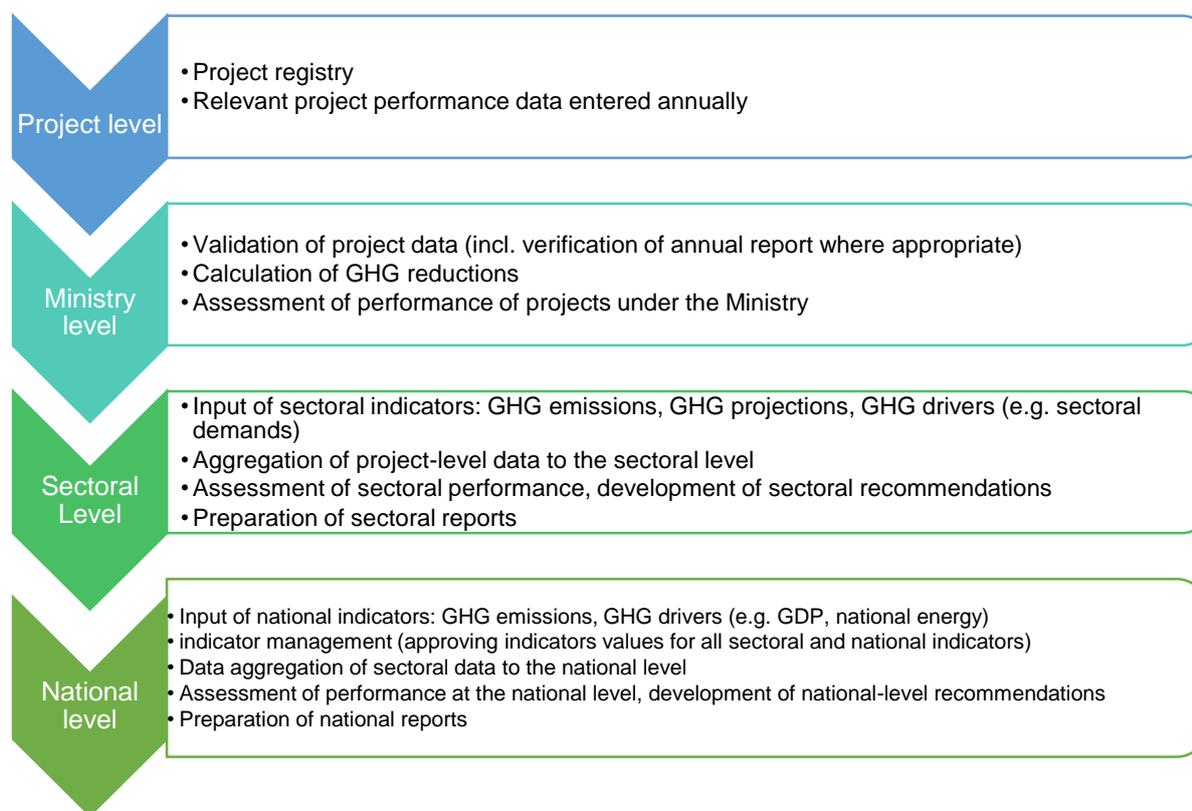
In 2016 a concept for an MRV system for Jordan was developed. This concept fulfilled two main functions:

- Collecting project-related data for the purpose of market-based mechanisms
- Collecting data on GHG emissions, mitigation actions and climate finance to support reporting requirements under the UNFCCC and also support tracking progress towards the mitigation element of Jordan's NDC.

The concept was developed for a pilot scope, covering the energy and water sector. The concept addressed tracking at four levels: project level, ministry level, sectoral level and national level. At each level, different data entry, data aggregation, data validation and data assessment processes take place. This was done to ensure that stakeholders are involved at the level, where they have most power to influence policy planning (e.g. within a ministry, at the sectoral and at the national level).

Figure 2-2 presents the four level and the key features of each level.

Figure 2-2 Overview of the key features of the multi-tier MRV system for Jordan

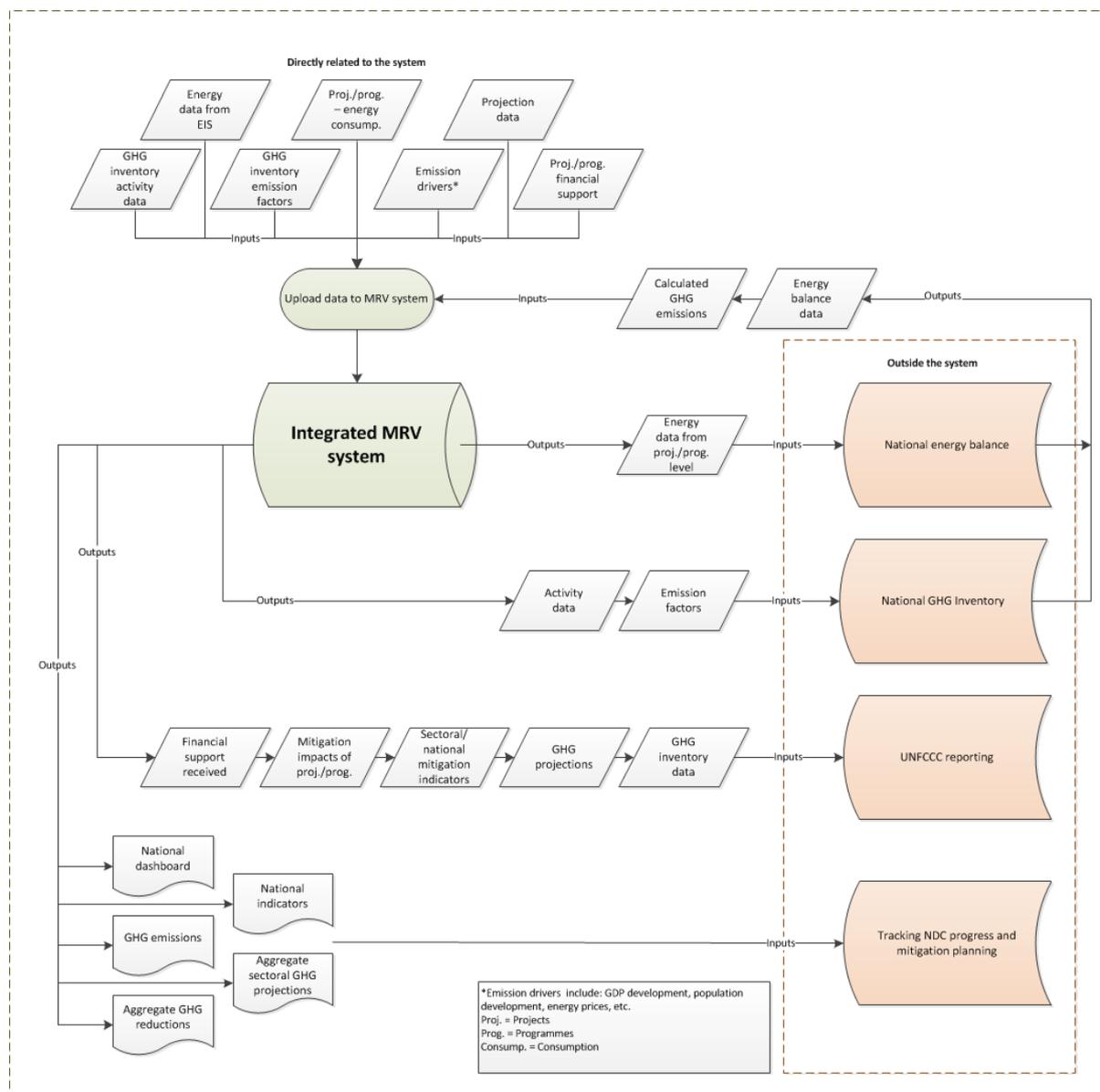


Source: Developed by Ricardo Energy and Environment

As part of the project a technical and a functional specification were developed, suggesting how to automatize specific functions of the concept. These included data entry, user-specific access to data, simple calculations, data storage, data visualisation, data aggregation, etc. This automatization should increase efficiency, enable central (while restricted) data access and reduce errors related to manual data handling. It is important to understand that there are elements of the concept, which cannot easily be automatized, e.g. the collection of certain data, gap filling and standardisation of data, complex calculations for the purpose of the GHG inventory, evaluation of data, development of policy recommendations. Only the concept as a whole provides the functionality necessary to inform policy planning. The functions suggested for automatization alone do not.

At present, the project level functions suggested for automatization have been automatized. Automatization of functions in the sector and national level remain to be implemented.

Figure 2-3 Overview of automatised and non-automatised functions (“outside the system”) at the national level



Source: Developed by Ricardo Energy and Environment

As the MRV system remains to be implemented both at the sectoral and at the national level in both its automatised and non-automatised functions, the LTS indicators could in principle be easily integrated. Some relevant data related to GHG emissions and energy demand, e.g. on sectoral-level GHG emissions, power consumption, fuel consumption are already foreseen to be tracked within the existing MRV system concept. The integration of the LTS indicators into the four levels of the system could be as follows:

- Indicators related to the implementation of actions are entered at the project level by the institutions responsible for the implementation of the actions. Actions under the LTS are not necessarily projects and will often not allow easily calculating GHG impacts as currently foreseen for the project level. However, including such measures into a project registry, e.g. with project description, responsible Ministry, implementing entity, support received (if applicable), starting and ending dates, etc. would already help provide an overview of measures in place. The

definition of measures, i.e. what characteristics measures have, would need to be extended, e.g. to allow defining implementation and output indicators for measures, indicating whether they contribute to mitigation and/or adaptation, indicating, whether a GHG impact is calculated in the system or not, etc. The quality control of the data takes place at the ministry level as under the current system.

- Indicators related to outputs of actions are entered at the project level as well.
- Indicators related to outcomes are tracked at the sectoral level, the most suitable institutions need to be identified. Potentially these are the sectoral ministries, e.g.
 - Ministry of Energy and Mineral Resources: Power generation, fuel consumption, efficiencies
 - Ministry of Water and Irrigation: availability of water, water consumption, water treatment
 - Ministry of Agriculture: crop and livestock production
 - Ministry of Local Administration: Waste
 - Ministry of Tourism and Antiquities: Tourism
 - Jordanian National Commission for Women: Gender
 - Ministry of Health: Health
 - Ministry of Environment: Ecosystems, forests, coastal areas
 - Ministry of Transport: Transport

Ministries would likely need to cooperate and exchange data for the compilation of certain indicators, e.g. on irrigation practices in agricultural crop production, on energy efficiency in the tourism sector.

- Indicators related to impacts (the pillars) are tracked at the sectoral level, where they can be clearly related to a sector (e.g. agriculture, energy, water, forestry). Otherwise they are tracked at the national level, this would fall under the responsibility of the Ministry of Environment.
- As most pillars are cross-cutting in their nature, the evaluation takes place at the national level in the form of an interministerial working group, which considers:
 - Whether the selected actions are being implemented as planned, considering the implementation indicators
 - What barriers in the implementation of measures might be faced (e.g. lack of international support, capacity, technology)
 - Whether these actions lead to the desired short and medium-term results, considering the outputs and outcomes
 - What progress with regards to the pillars is made and how actions, outputs and outcomes contribute to this progress and what actions might be taken if progress is not as expected.

Such an evaluation could be conducted annually or every two years, leading to policy recommendations. These could for example relate to enhancing / adjusting actions or adjusting processes to facilitate implementation of actions. Through the discussion in the interministerial working group, the recommendations could be directly fed back to the relevant Ministries.

3 Alignment with reporting under the Paris Agreement's Enhanced Transparency Framework

Jordan already has experience with climate tracking and reporting the results, for example with submitting National Communications under the UNFCCC. Data to be collected for this purpose overlaps relevantly with data to be collected under the multi-level MRV system, e.g. the GHG inventories and information about mitigation projects and support. From late 2024 onwards, Jordan will also be reporting Biennial Transparency Reports (BTR) under the UNFCCC at least every two years. BTRs will also include indicators related to the progress in implementing and achieving its NDC. The reporting requirements, which form part of the Paris Agreement's Enhanced Transparency Framework are provided in Box 1 below. With indicators related to Jordan's LTS again a relevant overlap in data required will occur, e.g. with regards to mitigation actions, adaptation actions, GHG emission data. In developing the MRV system for Jordan's LTS implementation it is thus key to

consider data needs of the future reporting to the UNFCCC, so data which is required for multiple purposes, is collected and compiled only once.

Box 1 Requirements for NDC reporting and tracking. The Paris Agreement, in Art. 13 establishes an Enhanced Transparency Framework (ETF). The ETF's specific reporting requirements are laid down in Decision 18/CMA.1¹, the modalities, procedures and guidelines (MPGs) for the transparency framework for action and support referred to in Article 13 of the Paris Agreement.

Among other, all countries are to report Biennial Transparency Reports from December 2024 onwards. Specific information to be covered by BTRs is presented in Figure 3-1. The flexibility options in the MPG aim to reduce the effort of reporting for such countries, allowing them to enhance their capacities over time, for example, by allowing to report fewer or less detailed information while capacity limitations prevail.¹

The MPGs require that all countries report on relevant indicators to track progress towards implementation of their NDC. This falls under information necessary to track progress in implementing and achieving the NDC, which is a shall requirement.

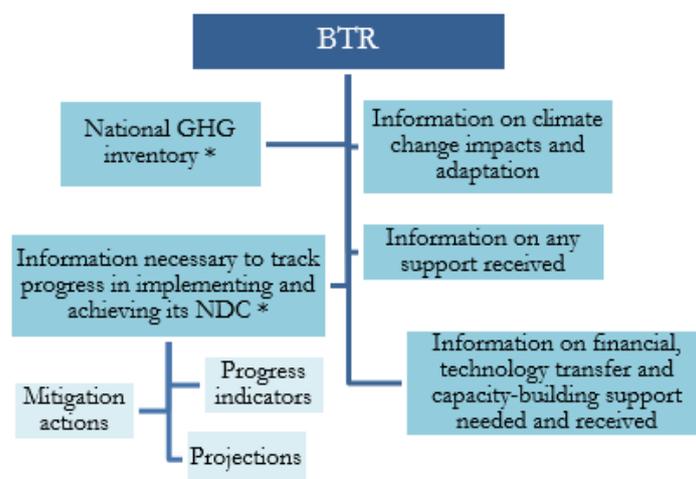


Figure 3-1. Key elements of the Biennial Transparency Report (BTR) for developing countries.

Source: Adapted from Zarzo et al. (2019)³⁹⁶

According to the MPGs, indicators for tracking progress towards a country's NDC are to be relevant to that NDC and can be qualitative or quantitative. The MPGs mention a number of illustrative examples which include net GHG emissions and removals, percentage reduction of GHG intensity, relevant qualitative indicators for a specific policy or measure, mitigation co-benefits of adaptation actions and/or economic diversification plans or other (e.g. hectares of reforestation, percentage of renewable energy use or production, carbon neutrality, share of non-fossil fuel in primary energy consumption and non-GHG related indicators).

Indicators are to be reported for each reporting year during the implementation of the NDC, providing information on reference point(s), level(s), baseline(s), base year(s) or starting point(s). The MPGs do not further define reference point(s), level(s), baseline(s), base year(s) or starting point(s). This paper takes the position that these are different terminologies which all relate to a similar concept, i.e. where an NDC target is defined in comparison to historical data (e.g. 1990 GHG emissions) or a counterfactual future development (e.g. the BAU for 2021-2030).

Where GHG inventory data is used, information reported is to be updated where recalculations of the GHG inventory take place. The MPGs require countries to report much additional information, including, how indicators are related to their NDC as well as methodologies and/or accounting approaches. While countries are at least encouraged to report GHG projections if they use flexibility in light of their capacities, GHG projection data will not be used to assess progress towards the mitigation targets

³⁹⁶ Zarzo, O. and Harries, J. (2019) Next steps under the Paris Agreement and the Katowice Climate Package. <https://www.cbitplatform.org/sites/default/files/knowledge-resource/resource-files/Next%20steps%20under%20the%20Paris%20Agreement%20and%20the%20Katowice%20Climate%20Package.pdf>