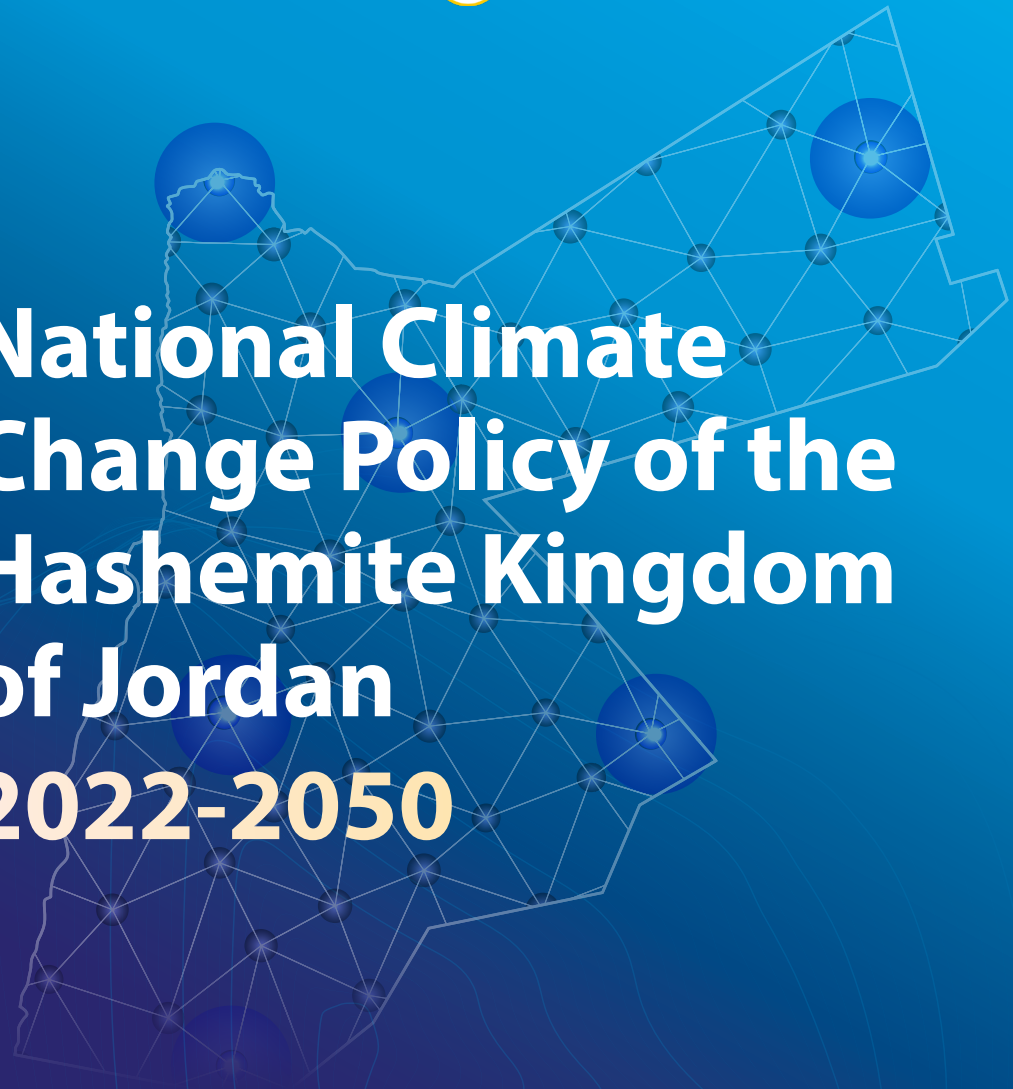
National Climate Change Policy of the Hashemite Kingdom of Jordan 2022-2050



September 2022

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National Climate Change Policy of the Hashemite Kingdom of Jordan 2022-2050

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List of Acronyms

AFOLU	Agriculture, Forestry and Other Land Use
BTR	Biennial Transparency Report
CBO	Community-based Organization
CC	Climate Change
CCP	Climate Change Policy
CH4	Methane
CO2e	Carbon dioxide equivalent
CSO	Civil Society Organization
CSR	Corporate Social Responsibility
EbA	Ecosystem-based Adaptation
EIA	Environmental Impact Assessment
ETF	Enhanced Transparency Framework
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographical Information System
Gg	Gigagram
HCFC	Hydrochlorofluorocarbon
HCST	Higher Council for Science and Technology
HFC	Hydrofluorocarbon
ICZM	Integrated Coastal Zone Management
IEA	International Energy Agency
IPM	Integrated Pest Management
IPPU	Industrial Processes and Product Use
IRENA	International Renewable Energy Agency
JREEEF	Jordan Renewable Energy and Energy Efficiency Fund
LPG	Liquefied Petroleum Gas
M&E	Monitoring and Evaluation
MoSD	Ministry of Social Development
MPG	Modalities, Procedures and Guidelines
NARC	National Agricultural Research Center

NCCC	National Climate Change Committee
NDC	Nationally Determined Contribution
NGO	Non-governmental Organization
NH3	Ammonia
NIE	National Implementing Entity
N2O	Nitrous oxide
PA	Paris Agreement
RCP	Representative Concentration Pathway
RSCN	Royal Society for the Conservation of Nature
RSS	Royal Scientific Society
SBUR	Second Biennial Update Report
SCA	Special Conservation Areas
SEEA-EA	System of Environmental-Economic Accounting – Ecosystem Account
SEP	Stakeholder Engagement Plan
SF6	Sulphur hexafluoride
SLCP	Short-lived Climate Pollutants
SMART	Specific, Measurable, Achievable, Relevant, Timely
SPI	Standardized Precipitation Index
TAP	Technology Action Plan
TNA	Technology Needs Assessment
UNESCWA	United Nations Economic and Social Commission for Western Asia
UNFCCC	United Nations Convention on Climate Change
UV	Ultraviolet

Foreword

On behalf of the Government of Jordan, it gives me great pleasure to present the Climate Change Policy of Jordan for the years 2022-2050. This policy is directed towards Jordan's important development sectors, policymakers, climate practitioners, as well as the general public interested in understanding Jordan's approach towards climate change and the institutional framework and plans in place to mitigate and adapt to it over the next three decades. The document aligns with Jordan's national policies and sectoral strategies, especially the recently published Jordan's Economic Modernization Vision. The document outlines Jordan's forward-looking vision to transform into a resilient low-carbon nation, contributing to the ambition of a global move towards a carbon neutral planet by the middle of this century.

Jordan's climate action is highlighted in the establishment of the Directorate of Climate Change at the Ministry of Environment in 2014 along with dedicated adaptation and mitigation departments. The Ministry of Environment has been assigned as a national focal point to the United Nations Framework Convention on Climate Change (UNFCCC) and is responsible for ensuring the fulfillment of commitments to the UNFCCC secretariat as well as the international community. The latest of these commitments has been the Second Biennial Update Report Under the UNFCCC, which was submitted in June 2021, and the revised Nationally Determined Contributions document which was a national effort that raised GHG reduction ambitions from 14% to 31% by 2030.

Even though Jordan only contributes 31.06 million tons of CO2 equivalent per year, which is about 0.06 percent of global emissions, the country remains heavily committed to mitigation actions under the principle of common-but-differentiated responsibilities and respective capabilities. The holistic approach to mitigation over the next 3 decades will be inclusive of all sectors contributing to national emissions.

Considerations for women, youth, and children were also a focus within the adaptation section of the policy, where cross-sectoral adaptation policies were careful to include the potential impacts on different social categories in the short, medium, and long terms and how to adapt to them. This approach will not only focus on achieving resilient Jordanian public and private sectors, but also on empowering citizens as future agents of change who are resilient to shocks as the world collectively works to minimize and eliminate the root causes of climate change.

To conclude, I would like to personally thank all national experts and stakeholders who provided their expertise, experience, and input to contribute to the completion of this document. The realization of this progressive policy would not have been possible without the support of GEF and the United Nations Development Programme (UNDP), and the contribution of WFP, UNICEF, UN Habitat, and UNEP.

Minister of Environment
Dr. Muawieh Khalid Radaideh

Summary

The Hashemite Kingdom of Jordan has updated its Climate Change Policy (CCP) of 2013-2020 into a document that provides guidance to build a climate resilient society that aims to be part of the global movement that aspires to reach carbon neutrality by 2050 in alignment with the objectives set under Jordan's Economic Modernisation Vision[1] and the United Nations Framework Convention on Climate Change. The updated CCP 2022-2050 has taken into account the lessons learned from the implementation of the first policy 2013-2020. The CCP 2022-2050 is an overarching document for mainstreaming climate change in all sectoral policies, strategies, and action plans. Hence, it is not prescriptive but only serves to provide strategic orientations for Jordan to build an ambitious low-carbon and climate resilient society, while also supporting the implementation of UNFCCC provisions. In short, all sectors will be called upon to use the CCP 2022-2050 as the framing document to mainstream climate change in their long-term strategic plans, which in turn will be used to inform updates to the Nationally Determined Contributions (NDCs). For ease of use, all policy orientations are given in tabular form.

The CCP 2022-2050 calls for a new paradigm of climate action, formulated based on a "Theory of Change" with the following vision:

> **"BY 2050, JORDAN WILL BE BETTER PREPARED AND MORE RESILIENT TO THE IMPACTS OF CLIMATE CHANGE.**
>
> It will achieve a high level of energy security commensurate with a sustainable path to maintain the momentum towards carbon neutrality through investments in low-carbon and climate-responsive initiatives and ramping up clean energy domestic use and export to drive the green economy for the wellbeing of all, including vulnerable communities, using the principles of inclusiveness and fairness, while simultaneously contributing to the global effort of stabilizing the climate system under the principle of common-but-differentiated responsibilities and respective capabilities".

[1] *Economic Moderisation Vision: Unleashing potential to build the future, https://www.jordanvision.jo/en*

Starting from a problem statement that emanated from a detailed assessment of the level of climate change mainstreaming in sectoral policies, strategies and action plans, policies and actions have been proposed for adaptation and mitigation to achieve the long-term policy objective : "To have development and national efforts support Jordan in being part of the global effort towards carbon neutrality by 2050, while simultaneously securing all sectors against the impacts of present and future climate change and climate variability in order to achieve the Sustainable Development Goals in the shorter-term and to secure a high quality of life for all".

The framing of the different sections of the Climate Change Policy 2022-2050 has been done to address the sectoral policies and actions for adaptation and mitigation, to articulate the enabling factors and to make the assumptions explicit. In addition, the framing has been aligned with the requirements of the Paris Agreement that will operationalize the UNFCCC up to 2030. A summary of the Climate Change Policy and its alignment with the Paris Agreement is summarized below.

The proposed policies (and accompanying actions and instruments) are expected to contribute to (a) Climate change mitigation, through the reduction of GHG emissions and the promotion of a low carbon economy; (b) Climate change adaptation, through the adoption of practices that reduce climate vulnerabilities and increase climate resilience; (c) Sustainable development, through the promotion of inclusive and sustainable growth, the creation of employment and the overall improvement of the quality of life of individuals (i.e., food and water security, access to clean energy, health conditions etc.). Investments in climate change adaptation and mitigation can today be also seen as a meaningful way for post-COVID-19 recovery.

The high-level strategic directives are expected to foster the development of strategies, plans and processes to:

Reduce greenhouse gas emissions across all sectors of the economy to contribute to the global effort of stabilizing the climate system, while simultaneously delivering sustainable development dividends.

Avoid, minimize or adapt to the negative impacts of climate change on key natural assets, including, among others, agriculture, water, and other vulnerable sectors.

Avoid or reduce damage to human settlements and infrastructure caused by climate change.

Harmonize the approach to CC policies, strategies and action plans using cross-sectoral issues and opportunities.

Address enabling factors such as capacity development, technology transfer and climate finance as means to formulating and implementing CC policies, strategies and action plans.

Build capacity to understand, analyze, and become more proactive in the wake of future climate change impacts within the country.

Address cross-cutting and emerging issues that may offer opportunities or act as additional stressors such as inclusiveness, women enabling, disaster risk management, urban migration and refugees, respectively.

Integrate and mainstream climate change into core development policies, strategies and plans as part of an agenda for constructing a green economy for sustainable development.

Endeavor to obtain, to the extent feasible, the involvement and **participation of all stakeholders at the national and local level** in addressing issues related to sustainable development (institutional mechanisms for inclusiveness and transparency);

Establish clear and reliable indicators for policy formulation and evaluation.

Procure and allocate financial and other resources, as appropriate and feasible, to ensure that climate change policies and investments are addressed in the manner required.

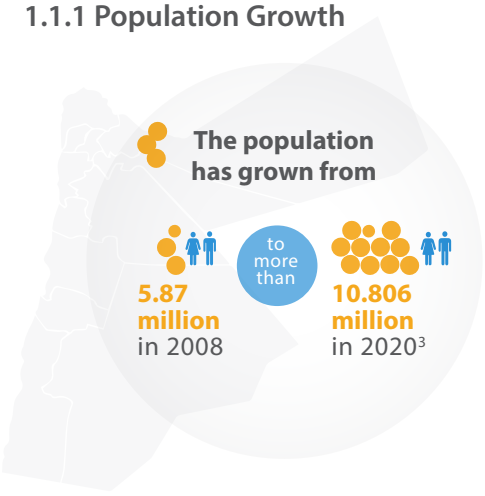
The CCP 2022-2050 integrates a Monitoring & Evaluation framework that can be used to achieve the twin objectives of, first, evaluating its implementation, and second, establishing an Enhanced Transparency Framework. Given the long-time horizon covered by the CCP, periodic updates will be required to integrate changes in the dynamic operating context and changing capabilities of institutions. Review of the implementation of the CCP 2022-2050 is expected to be aligned with the 5-year NDC review process.

1 National Context and Policy Vision

1.1. The National Context

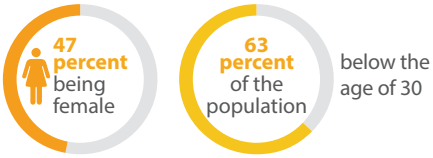
Jordan is relatively a small country situated at the heart of the Middle East, occupying an area of approximately 89,213 square kilometers. Despite the relatively small area, Jordan has a diverse terrain and landscape demonstrating a variety usually found only in large countries.[2] Jordan is divided into twelve administrative areas or governorates. The governorates are subdivided into districts and sub-districts, and within each governorate there are several municipalities. This imposes its own challenges in terms of coordinating stakeholders at multiple geographical scales for achieving low-carbon, climate resilient development.

1.1.1 Population Growth



THIS SHARP INCREASE IS IN PART DUE TO THE POLITICAL UNREST IN THE REGION AND THE SIZABLE INFLUX OF REFUGEES INTO JORDAN, MAINLY SYRIAN REFUGEES.

Jordan's population is predominantly urban (90 percent) and young, with:

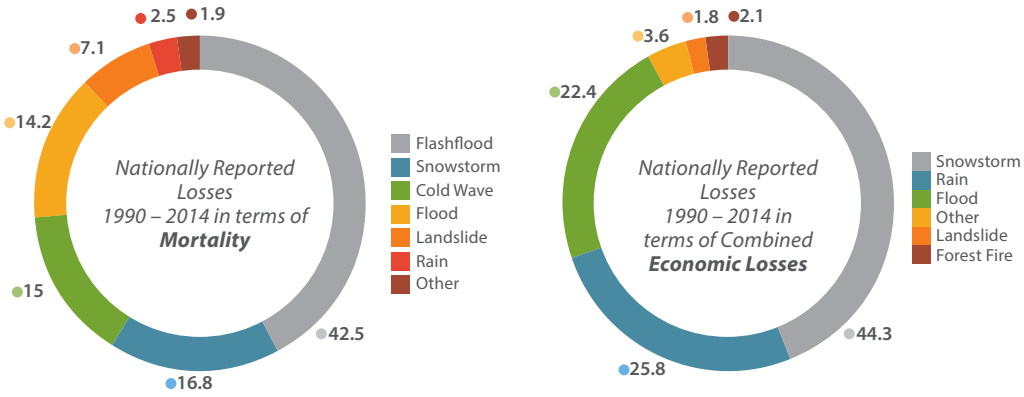


Thirty percent of the population is non-Jordanian, including a high proportion of refugees. While a response plan is in place to manage and mitigate the impact of the crisis resulting from the consumption and pressures on natural resources and ecosystem services, it is understood that these pressures will be exacerbated by climate change and climate variability.

[2] *About Jordan | King Abdullah II Official Website – accessed 16 June 2021.*
[3] *General Population and Housing Estimation for the Fourth Quarter of 2020, Department of statistics, Amman, Jordan. PopulationEstimates.pdf (dos.gov.jo).*

Jordan's ambitions towards sustainable development are challenged by multiple biophysical and socio-economic realities, including water scarcity, rapid population growth and urbanization, high unemployment rates (24.8% in 2021[4]) especially among women and young people, migration, limited economic resources (fragile and limited natural resources), ongoing regional conflicts, low levels of technology adoption, reliance on expensive imported energy, widespread poverty (14.4% in 2010[5] and 15.7% in 2019[6]), in addition to natural disasters (e.g. earthquakes, land degradation, flash floods, landslides, and recurrent droughts) (Figure 1), of which many are compounded by climate variability. Individuals, households, and communities are vulnerable to extensive asset and livelihood losses that are expected to worsen with climate change.[7,8]

Figure 1. Mortality and economic losses from disasters: 1990-2014.



GENDER MAINSTREAMING REMAINS A CHALLENGE IN JORDAN.

Female-headed households represent

27 percent of households in refugee camps

16 percent in host communities

and are more likely than male-headed households to be food-insecure (16 percent versus 13 percent).[9]

Generally, female-headed households are more likely to be vulnerable to the impacts of climate change and resources insecurity.

[2] *About Jordan | King Abdullah II Official Website – accessed 16 June 2021.*
[3] *General Population and Housing Estimation for the Fourth Quarter of 2020, Department of statistics, Amman, Jordan. PopulationEstimates.pdf (dos.gov.jo).*
[4] *http://dosweb.dos.gov.jo. Unemployment rate for Jordanians, second quarter, 2021.*
[5] *http://dosweb.dos.gov.jo/population/poverty/ - accessed 14 April 2021.*
[6] *Poverty & Equity Brief: Jordan - Middle East & North Africa. April 2020, Worldbank. Global_POVEQ_JOR.pdf (worldbank.org)*
[7] *Ministry of Environment, 2014. Third National Communication Report to UNFCCC. Amman, Jordan.*
[8] *http://www.moenv.gov.jo/ebv4.0/root_storage/ar/eb_list_page/final_draft_nap-2021.pdf*
[9] *WFP and REACH. 2018. Jordan - Comprehensive Food Security and Vulnerability Assessment, 2018. https://www1.wfp.org/publications/wfp-jordan-comprehensive-food-security-and-vulnerability-assessment-2018.*

JORDAN IS ALSO RANKED

113 out of 162 countries in the gender inequality index[10]

122 out of 146 in the Global Gender Gap Report 2022[11]

further highlighting the need to address gender inequality by empowering women as agents of change.

THE JORDANIAN POPULATION STRUCTURE REFLECTS THE RELATIVELY YOUNG AGE OF THE POPULATION, WHERE APPROXIMATELY:

34%
of the population are less than 14 years old

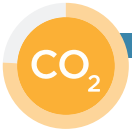
42%
are between 25-64 years old, representing the dominant group.

The age group of 25-54 years old represents the demographic entering the workforce and hence the main age group contributing to social, economic, and political development.[12]

1.1.2 Water, Energy, and Trade Balance

There are many sectors critically linked with climate change. Jordan currently imports around 93% of its total energy, comprising almost 8% of the country's gross domestic product (GDP) and placing a strain on its economy.

THE ENERGY SECTOR WAS JORDAN'S LARGEST EMITTER



(76%) of greenhouse gases (GHGs) in 2016.[13]

The National Energy Sector Strategy for 2020-2030[14] aims to increase energy self-sufficiency through the utilization of domestic natural and renewable resources, as well as expansion of existing energy developments. It aims to increase the share of renewable and alternative energy projects in covering the Kingdom's needs of electric energy from 13% in 2019 to 31% by 2030, which will contribute to potential GHG reduction by 10%.

[10] *Human Development Report 2019: Inequalities in Human Development in the 21st Century, UNDP. http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/JOR.pdf*
[11] *World Economic Forum, 2022. https://www3.weforum.org/docs/WEF_GGGR_2022.pdf*
[12] *Department of statistics, Jordan Statistical Yearbook 2020. http://dosweb.dos.gov.jo/products/jordan-statistical-yearbook-2020/*
[13] *Ministry of Environment, 2020. Jordan's Second Biennial Update Report (SBUR) to the UNFCCC 2020.*
[14] *National Energy Sector Strategy for 2020-2030. Ministry of Energy and Mineral Resources, 2020. https://www.memr.gov.jo/EBV4.0/Root_Storage/AR/EB_Info_Page/Strategy2020.pdf*

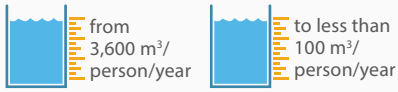
Table 1. GHG emissions (+) and removals (-) in Gg CO2eq by Gas and by Sector, 2016.

Categories	CO_2	CH_4	N_2O	HFCs	SF_6
	(Gg)	(Gg of CO_{2eq})			
Total national emissions and removals	24,385.37	4,675.49	1,245.14	757.29	0.022
Energy	23,054.59	439.38	155.49	NA	NO
IPPU	2,194.88	0.00	225.22	757.29	0.022
AFOLU	896.76-	614.62	710.85	NA, NO	NO
Waste	32.66	3,621.5	153.58	NA	NO

Where NO means "not occurring" and NA means "not applicable".
Source: Jordan's SBUR under the UNFCCC 2020

JORDAN IS ONE OF THE MOST WATER-SCARCE COUNTRIES IN THE WORLD[15,16,17,18]

The annual per capita water availability has declined



far below the threshold of 500 m³/person/year which indicates severe water scarcity.[19]

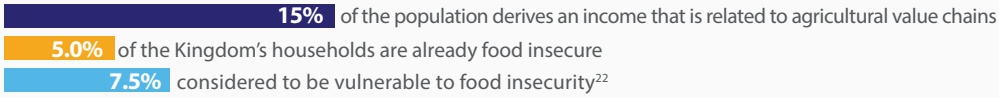
The water scarcity in Jordan is further exacerbated by the huge influx of Syrian refugees and the fluctuation of the precipitation trends resulting from the adverse impacts of climate change and the increase of drought frequencies and severity that imposed unprecedented strain on the fragile natural water resources. This has severe implications on the availability of safe drinking water and Jordan's long-term ability to supply water for agriculture and will amplify the drop of groundwater level in the main aquifers, which is currently dropping at an average rate of 2 m/year. In response to that, the Government of Jordan put in place a set of accelerating measures (through the Jordan Response Plan - JRP) to offset the increasing demand by the refugees and host communities, through expanding groundwater wells, and enhancing sewer and greywater networks.

These pressures are exacerbated by the observed and projected adverse impacts of climate change. Climate projections to 2100 reveal that Jordan is likely to experience:

- 2.1°C increase in air temperature for the RCP4.5 scenario
- Drier climate with an average decrease in annual rainfall of 21%
- More frequent droughts with an increase in the maximum number of consecutive dry days and Standardized Precipitation Index (SPI) magnitudes
- More severe land degradation
- A shift in rainy seasons at both wet seasons tails,[21] thus impacting all sectors but mainly water, agriculture, biodiversity, marine environment, and health.

[15] *Water Scarcity Clock. 2021. Water Scarcity Clock (worldwater.io)*
[16] *Water Risk Atlas, 2021. Aqueduct Water Risk Atlas (wri.org)*
[17] *Ministry of Water and Irrigation, 2009. Water for Life: Jordan's Water Strategy for the period of 2008-2022. MWI, Amman, Jordan, 2009.*
[18] *https://www.unicef.org/jordan/water-sanitation-and-hygiene*
[19] *Ministry of Water and Irrigation, 2017. Jordan Water Sector-Facts and Figures, Amman, Jordan.*
[20] *Ministry of Water and Irrigation, 2018. (National Water Strategy of Jordan 2016-2025, MWI, Amman, Jordan.*
[21] *Ministry of Environment, 2014. Third National Communication Report to UNFCCC. Amman, Jordan*

The water-agriculture and climate-food security nexuses are particularly important since climate-related disasters and shocks pose a particular threat to food systems and food security.



1.1.3 Covid-19 Pandemic

The COVID-19 pandemic has imposed an immediate downside risk to the global economic recovery and to Jordan's Vision 2025. Given Jordan's already elevated debt levels, policy responses are constrained by limited fiscal space and a drop in capital flows to emerging markets as global risk aversion surges due to the pandemic. The COVID-19 situation increased unemployment, especially among youth. At the same time, it increased water consumption due to increased household water usage and significant public cleaning efforts during periods of lockdowns. The pandemic should be taken as an unforeseen external shock, and it should provide valuable lessons on how to anticipate and address the shocks that will arise from a changing climate.

1.1.4 International Context

Addressing climate change from both adaptation and mitigation perspectives under the post-2020 climate framework defined in the Paris Agreement (PA) provides opportunities for low-carbon, climate resilient development of Jordan. Such an approach would support a green economy strategy, and it will be squarely aligned with recent interventions to achieve high and sustainable economic growth rates, reduce unemployment and poverty, and increase economic participation, especially among young people and women.[24,25] In addition, Jordan launched a new National Vision and Strategy 2025[26] which sets out long term policy goals for economic growth and social development. "Jordan submitted its Nationally Determined Contribution (NDC) to the UNFCCC in November 2016[27] (and updated in October 2021) with a strong focus on strengthening resilience and adaptation to climate change in the water and agricultural sectors as a priority response to climate change, and provisions are made under the PA for increasing the levels of adaptation and mitigation ambitions using a ratchet approach". Jordan also drafted a National Climate Change Adaptation Plan of Jordan in 2021 with a clear vision to contribute to achieving a pro-active, climate risk-resilient country that ensures the increased

[22] *Analysis report on the state of food security in Jordan (2013-2014), food_2013-2014.pdf (dos.gov.jo)*
[23] *Jordan's Economic Update — April 2020. https://www.worldbank.org/en/country/jordan/publication/economic-update-april-2020*
[24] *UNDP, 2013. Jordan's' Poverty Reduction Strategy (2012-2020), Amman, Jordan*
[25] *Ministry of Planning and International Cooperation, 2011. Jordan National Employment Strategy (2011-2020), Amman, Jordan*
[26] *Jordan Strategy and Vision 2025: A National Vision and Strategy. Amman, Jordan.*
[27] *Ministry of Environment, 2015. Intended Nationally Determined Contribution (INDC). Amman, Jordan. https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Jordan%20First/Jordan%20INDCs%20Final.pdf*

resilience of its communities, institutions, natural ecosystems, water, and agricultural resources in the path towards sustainable and climate-resilient development. The adaptation plan achieves this through the identification of a set of measures to be addressed in various sectors to guide institutions such as governmental, academic, CBOs, and private sector entities to implement adaptation initiatives, and develop partnerships and synergies to reach the required adaptation goals.[28]

While the first Climate Change Policy (CCP) 2013-2020 has served Jordan well,

THERE IS A NEED TO UPDATE THE POLICY TO MEET THE CHALLENGES AND REQUIREMENTS OF THE POST-2020 CLIMATE REGIME.

JORDAN STILL FACES SEVERAL CHALLENGES, WHICH REQUIRE THE CONTINUATION OF THE MOMENTUM WITNESSED SO FAR TO CARRY ON THE TRAJECTORY NEEDED BY UPDATING THE CCP 2013-2020 TOWARDS 2050

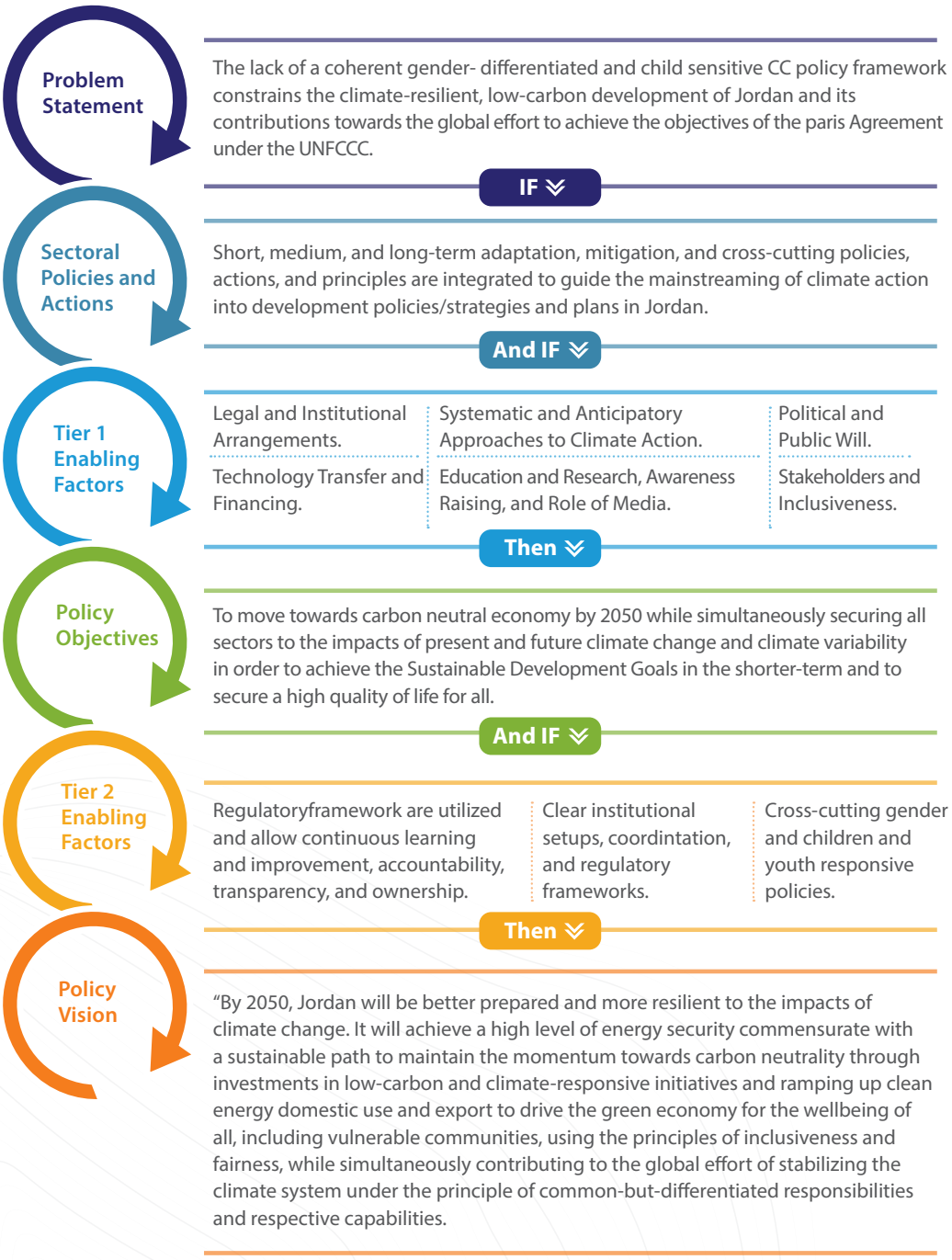
through the development of this policy document , a key feature of which is the development of an inclusive and coherent women, youth, and child sensitive climate change policy framework that corresponds with the climate resilient, low-carbon development of Jordan and its contributions towards the global effort to achieve the objectives of the Paris Agreement under the UNFCCC.

1.2. Policy Vision, Objective and Principles

A theory of change **(Figure 2)** has been developed to link the problem statement arising from the national context to the policy vision through policy instruments/ actions and the long-term objective of the CCP 2022-2050. The climate change adaptation and mitigation policies and accompanying instruments and actions are detailed in Section 2, while the enabling factors and assumptions are covered in Section 3 and Section 4, respectively. The CCP 2022-2050 is an overarching document for guiding the mainstreaming of climate change in all sectoral policies, strategies, and action plans. Hence, it is not prescriptive but only serves to provide strategic orientations for Jordan to build a low-carbon and climate resilient society, while also supporting the implementation of UNFCCC requirements.

[28] *Draft of Jordan National Adaptation Plan -2021.pdf (moenv.gov.jo)*

Figure 2. Theory of Change underlying the Climate Change Policy: 2022-2050.



POLICY VISION:
"BY 2050, JORDAN WILL BE BETTER PREPARED AND MORE RESILIENT TO THE IMPACTS OF CLIMATE CHANGE.

It will achieve a high level of energy security commensurate with a sustainable path to maintain the momentum towards carbon neutrality through investments in low-carbon and climate-responsive initiatives and ramping up clean energy domestic use and export to drive the green economy for the wellbeing of all, including vulnerable communities, using the principles of inclusiveness and fairness, while simultaneously contributing to the global effort of stabilizing the climate system under the principle of common-but-differentiated responsibilities and respective capabilities.

LONG-TERM OBJECTIVE:
"TO HAVE NATIONAL DEVELOPMENTS AND EFFORTS SUPPORTING JORDAN BEING PART OF THE GLOBAL EFFORT TOWARDS CARBON NEUTRALITY BY 2050, while simultaneously securing all sectors to the impacts of present and future climate change and climate variability in order to achieve the Sustainable Development Goals in the shorter-term and to secure a high quality of life for all".

The policy vision, its long-term objective and the framing of policies are underlined by the Rio principles of sustainable development. The most notable principles that underpin the CCP 2022-2050 are:

- **Sovereignty (Principle 2)**
- **Common-but-differentiated responsibilities and respective capabilities (Principle 7)**
- **Inclusiveness and subsidiarity (Principle 10)**
- **Women and youth participation (Principle 20 and Principle 21)**
- **Intergenerational equity (Principle 3)**
- **Poverty elimination (Principle 5)**
- **Precautionary approach (Principle 15)**
- **Valuing indigenous knowledge (Principle 22)**
- **Partnerships (Principle 27)**

2 Adaptation and Mitigation: Polices and Actions

Actions are proposed to operationalize the CCP 2022-2050 by identifying sectoral challenges and opportunities (Annex 1). A set of concrete actions is associated with each adaptation/mitigation policy to facilitate the implementation of the overall climate change policy and the monitoring of progress.
An indicative time frame for implementation is assigned to each action to provide guidance for the establishment of an activity schedule based on three time-frame options, namely:

Short Term: within 5 years from the approval of the plan.

Medium Term: between 5 and 10 years from the approval of the plan.

Long Term: more than 10 years from the approval of the plan.

In addition, a justification is provided for each suggested time frame, based on a number of criteria, including:

• **Immediate Opportunity (IO):** the conditions are in place for the implementation of the activity.

• **Urgent Problem (UP):** the activity should be implemented promptly to address a worrying situation.

• **Research and Development (R&D):** the activity requires research on innovation (e.g., technologies), which might delay implementation.

• **Infrastructure Development (ID):** the activity involves the construction/ expansion of infrastructure, thereby requiring longer time for completion.

• **Institutional Capacity (IC):** the building of institutional capacity is required prior to (or during) the implementation of the activity.

• **High Cost (HC):** significant investments are needed to implement the action, leading to potential delays.

• **Social acceptance (SA):** awareness raising and sensitization campaigns should be conducted prior to (or during) the activity in order to strengthen social acceptance.

• **Stakeholder Engagement (SE):** the stakeholder consultation phase might require a significant time period.

• **Policy Process (PP):** the implementation might be delayed by policy/legislative procedures.

• **Co-benefits (CB):** actions that result in adaptation and mitigation co-benefits.

2.1. CC Adaptation

The adaptation policies and actions (Table 2) support the adaptation policy statement of "reducing vulnerability and increasing resilience to the impacts of climate change and climate variability in a proactive manner". A cornerstone of the proposed policies and actions is that they must be sensitive to women, children and youth, and vulnerable groups. The adaptation policies and actions are not meant to be exhaustive, but to serve as guidance for developing coherent cross-sectoral adaptation planning.

Table 2. Adaptation Polices and Actions.

	Policies	Action List	Time Frame	Reasons
WATER (W)				
W1	Support water supply, conservation, and related infrastructure development	W1.1. Integrating Climate adaptation and resilience in the policy and institutional reforms in the water sector (e.g. Structural integration of climate change adaptation in the new National Water Masterplan, and strengthening the human, technical and administrative capacities of the Climate Change Directorate at Ministry of Water and Irrigation, Directorate of Environmental Health/Communicable diseases, and related authorities.	Medium Term	IO, UP, IC, PP
		W1.2. Improving water demand management and reducing the gap between water demand and supply, e.g. reducing non-revenue water loss in domestic and irrigation water supply systems, enhancing water storage capacity in natural dams and water retention systems, reducing groundwater use for irrigation and enhancing water recharge technologies, treated wastewater reuse in agriculture, industry greeneries, desalination plants in Aqaba and water conveyance, such as the National Conveyor Project and other similar projects.	Medium Term	UP, ID, CB
		W1.3. Improve the adaptive capacity of water utilities (e.g. Conducting climate proofing studies for existing water utilities and integration of climate proofing tools for planned water utilities, creation of map for flash flood prone area as a tool for risk assessment, enhancing performance and efficiency of water utilities through technological improvements and capacity development, enhancing the role of the private-sector as an accelerator and source of innovation through effective regulatory and legislative frameworks, etc..).	Medium Term	IO, R&D, SA

	Policies	Action List	Time Frame	Reasons
W1	Support water supply, conservation, and related infrastructure development	W1.4. Improve efficiency in water use for sustainable development (e.g. Promote water-harvesting techniques at all levels, introducing water saving technologies, enhancing the use of water efficiency technology at household and business levels in urban and rural settings, enhancing the adaptive capacity of small farmers in Jordan Valley through water user associations for increasing use of reclaimed water for irrigation purposes, etc…).	Medium Term	SA; CB
		W1.5. Improving contribution of non-conventional water resources to the national water budget (e.g. Promote the use of non-conventional water sources especially treated wastewater for non-domestic water use, increasing of the number and scope of use of decentralized wastewater treatment plants in rural areas, promote desalination programs for drinking water and irrigation, promote rainwater harvesting in urban areas from rooftops, etc…).	Medium Term	SE; CB
		W1.6. Water conservation incentives – incentivize water pricing systems that reward conservation, accounting for differences between ecological zones with regards to growing conditions, crops, and other agronomic needs.	Medium Term	IO; CB
		W1.7. Floodplain Easements - Work with willing sellers to identify voluntary floodplain corridor protection (flowage) easements on agricultural lands to maintain agricultural production that is compatible with flood conveyance, whilst ensuring it does not affect existing dam functions.	Medium Term	SE
		W.1.8. Improve rainfall early warning systems and reducing flood and drought risks (e.g. meteorological capacities in forecasting of long term and short term weather conditions as related to extreme weather risks, flood and drought resilience through risk management measures, development of flood and drought risks maps for all impacted areas, improved infrastructure, emergency preparedness, mitigation, and recovery operations, etc…).	Medium Term	UP, R&D
		W1.9. Support watershed and basin level management including transboundary water (e.g. vulnerability assessment of surface water and groundwater basins, preservation, rehabilitation and restoration of key watersheds in Jordan for enhanced retention of surface water and recharge to groundwater, enforcing laws to protect the quality of surface and groundwater and prevent dumping/pollution, and/or incentives for cleanup and restoration of watersheds and basins, developing pragmatic management plans for transboundary watersheds by political agreements, etc…).	Long Term	UP; SA; SE

	Policies	Action List	Time Frame	Reasons
AGRICULTURE (A)				
A1	Promote the use of adaptive agricultural technologies and techniques and provide incentives for the development of green agri-business	A1.1. Integrating climate resilience in the policy and institutional reforms in agricultural sector (e.g. Develop and implement a climate change and food security resilience investment plan, provide economic incentives for climate change mitigation and adaptation programs at farm levels, activation of land use laws to avoid urban expansion on agricultural lands, modification of policies and implementation of action plans with emphasis on socio-economic strategies, enhancing the capacities of climate change related units and directorates at Ministry of Agriculture and NARC, etc…).	Short Term	IO; PP; IC
		A1.2. Improving irrigation system efficiency (e.g. develop soil-water-plant monitoring programs, enhancing water harvesting techniques, maximizing treated waste water re-use, improving water use efficiency as SMART practices, improving soil water storage, reduce soil erosion through community management, use of Ecosystem based Adaptation (EbA) measures, etc…).	Short Term	UP; SA
		A1.3. Inform and train farmers on cover crops cultivation and diversified crop rotation techniques that help in improving soil physical conditions to reduce erosion and increase fertility and productivity.	Short Term	UP; SA
		A1.4. Shifting to water efficient crops (e.g. Introduce and diversify tolerant crop with high productivity capable of withstanding drought, salinity, and heat conditions, producing and promoting an agro-climatological calendar, etc...).	Medium Term	SA; UP
		A1.5. Support conservation agriculture (e.g. Promote organic, biodynamic, minimum conservation tillage, fallow practices, etc.) and supporting environment friendly agriculture and permaculture designs, promote hydroponic and other water tolerant agricultural productivity systems, formation of community cooperatives responsible for the use of range lands and grazing rights, increasing forage-livestock system, production and preservation, etc…).	Medium Term	IO; CB
		A.1.6. Promote composting and support the use of compost as a substitute to traditional fertilizers in order to enrich soils.	Medium Term	IO; CB

	Policies	Action List	Time Frame	Reasons
AGRICULTURE (A)				
A1	Promote the use of adaptive agricultural technologies and techniques and provide incentives for the development of green agri-business	A1.7. Enhancing drought management systems including capacity building on best practices (e.g. Strengthen institutionalization and deployment of existing early warning system, strengthen the financial resources available for compensation of farmers after drought – e.g. Agricultural Risk Fund, provide incentive and subsidy programs, use of farmers' indigenous knowledge and tradition to adapt to climate change under drought conditions, enhance the awareness towards forecasted droughts impacts and adaptation measures, etc.), and through linking the initiatives with social protection system and gender mainstreaming at sectoral, community, and household levels.	Medium Term	UP; R&D; IC, PP
		A1.8. Up-scale locally proven Integrated Pest Management (IPM) technologies, especially for important cash crops.	Medium Term	SE; HC
		A1.9. Promote and incentivize use of sustainable nutrient inputs in line with agro-ecology approaches.	Medium Term	SA; PP
		A1.10. Improving sustainable productivity of food chains (e.g. Promoting efficiencies in the food chain and the reduction of post-harvest losses and food waste in a sustainable manner, increasing the efficiency of nitrogen use, improving livestock productivity).	Medium Term	IO; CB
		A1.11. Integrating nexus approach to design future, inherently interlinked systems planning in a holistic manner while capturing existing opportunities and exploring emerging ones.	Long Term	IO; R&D; CB
		A1.12. Enhancing productivity of rangeland management (e.g. diversification of livelihoods and income in rangeland areas, improving sustainable management of grazing reserves, identification of best locations for implementation of Hima concepts in rangeland and arid land management, etc…).	Long Term	HC; SE; CB
		A1.13. Promote urban agricultural practices at both small scale household level and large scale commercial level through technology investments, local community engagement, and awareness programs.	Short Term	IO; SA, SE

	Policies	Action List	Time Frame	Reasons
AGRICULTURE (A)				
A1		A1.14. Enhance the last mile delivery of climate services tailored to the specific needs and preferences of smallholder farmers to better adapt to climate variability (e.g. strengthening the credibility of the information that national meteorological services provide, establishment of climate service intervention, strengthening the linkages between climate services, inclusiveness, gender mainstreaming, adoption of climate smart agriculture (CSA) practices, scale up the use of information and communication technologies (ICT) to manage climate risks, etc...).	Medium Term	IO; SA, SE
AGRICULTURE (A)				
A2	Promote integrated land use planning practices	A2.1. Provide training and educational courses on land use planning at the community level, especially for the development of sustainable urban agriculture.	Short Term	IO
		A2.2. Promote the use of GIS and remote sensing for supporting climate information systems in climate-smart agriculture.	Short Term	IO
		A2.3. Facilitate the introduction of carbon trading in the agriculture sector, as incentive for improving farming practices.	Long Term	PP; IC; CB
		A2.4. Building capacities of hydrological and meteorological (hydromet) agencies to design and deliver better products and services for smallholders.	Medium Term	IC; SE
ECOSYSTEMS AND BIODIVERSITY (EB)				
EB1	Promotion of working landscapes with ecosystem services to improve agro-biodiversity	EB1.1. Provide technical and financial assistance and incentives for the conservation of "bee pastures" and the use of on-farm planting beneficial to native and non-native pollinators, all with consideration given to crop compatibility (i.e. seedless crop varieties).	Long Term	HC; PP; R&D; CB
		EB1.2. Support knowledge transfer, implementation of knowledge and policy development, and the design of subsidy programmes to integrate functional agrobiodiversity (FAB) in agricultural systems.	Long Term	IC; SE
		EB1.3. Preservation of environmental reservoirs and maintaining an "ecological focus area" through field margins, hedges, trees, fallow land, landscape features, biotopes, buffer strips, and forested area.	Long Term	PP; SA; SE

	Policies	Action List	Time Frame	Reasons
ECOSYSTEMS AND BIODIVERSITY (EB)				
EB2	Enhance climate adaptive capacity in ecosystems and protecting ecosystem services	EB1.4. Promote natural enemies and potentially reduce pest populations in addition to reduce pesticide drift and nutrient flows into surface waters through strengthening the ecosystem service of pest control.	Long Term	PP; SA; SE
		EB1.5. Guarantee food security by maintaining local breeds and varieties used in agriculture to safeguard the world's plant genetic resources especially well adapted crops, varieties and landraces to local conditions, to support agrobiodiversity and potentially enhance ecosystem services, including pest and disease suppression, carbon sequestration and soil erosion.	Medium Term	R&D; PP; SE
		EB1.6. Boost the number of pollinating insects on commercial farms by creating specific habitats, tailored to local conditions and native insects.	Medium Term	IO; SA; SE
		EB2.1. Increasing the scope of ecosystem-based adaptation in protected areas and special conservation areas (e.g. introducing and enhancement of Nature Based Solutions (NBS) through identification and implementation of appropriate Ecosystem Based Adaptation (EbA) tools especially in Protected Areas buffer zones and special conservation areas (SCAs), etc…).	Short Term	HC; PP, CB
		EB2.2. Promoting ecosystem rehabilitation and restoration, and combatting desertification on the margins of existing conservation areas using green infrastructure and community participation (e.g. NGOs and local communities, and private sector) especially in allocating their Corporate Social Responsibility (CSR).	Medium Term	HC; SE; CB
		EB2.3. Enhancing the adaptive capacity of ecosystem services against extreme and long-term climate change impacts (e.g. developing a national plan for mitigating extreme events disasters (e.g. forest fire incidents, and wetlands degradation) can maximize the sustainable use of ecosystem services in key ecosystems and habitats in Jordan).	Medium Term	IO; R&D; CB
		EB2.4. Improving conservation measures for climate threatened species and habitats (e.g. developing recovery and restoration plans for highly threatened ecosystems and species of fauna and flora (including the development of clear ex-situ conservation, captive breeding programs, and restoration of natural habitats programs).	Long Term	IO; IC; ID; PP

	Policies	Action List	Time Frame	Reasons
ECOSYSTEMS AND BIODIVERSITY (EB)				
EB2	Enhance climate adaptive capacity in ecosystems and protecting ecosystem services	EB2.5. Improving conservation measures against emergence and spread of zoonotic infectious diseases (e.g. mapping and continuous monitoring of all critical habitats that include the presence of species that could act as vectors for zoonotic diseases, in addition to improving habitat connectivity by linking protected areas and special conservation areas through corridors).	Long Term	UP; R&D; CB
		EB2.6. Improving field research and monitoring of ecosystem vulnerability to climate change.	Medium Term	IO; R&D; CB
		EB2.7 Expanding protected areas based on biodiversity hot spots, and ecosystems future dynamics.	Short Term	IO; SE; CB
HEALTH (H)				
H1	Enhancing the preparedness and adaptive capacity of the health sector to address climate induced health impacts[29] and emerging diseases	H1.1. Improving preparedness and resilience of health sector to climate change through mainstreaming climate change in the policies/ strategies and plans of the Ministry of Health	Short Term	IO; R&D; CB
		H1.2. Enabling and building the capacity of health sector in climate change, especially the climate -induced health risks prediction, assessment, mapping, surveillance and rapid response.	Short and Medium term	IO; R&D; IC; PP; CB
		H1.3. Educating and informing the public health institutions and cadres about the adverse impacts of climate change, and the needed measures to improve the effectiveness of decision making processes to lessen its adverse impacts.	Short and Medium term	IO; IC; R&D; SE
		H1.4. Enhancing the health sector infrastructure (e.g., medical waste treatment, introducing renewable energy supply to health facilities, treated wastewater reuse, outdoor green spaces.)	Short and Medium term	IO; R&D; IC; SE; PP
		H1.5. Designing and implementing research, surveys and technical assessments for the gaps and needs of climate change-induced health issues.	Short and Medium term	IO; R&D; IC; SE
		H1.6. Developing climate-informed disease control programs and surveillance systems using meteorological services to target vector control in time and space.	Short and Medium term	IO; R&D; PP
		H1.7. Carry out economic analyses of the costs of climate-induced health impacts to inform effectiveness and efficiency of health-related decision making.	Short Term	IO; R&D; CB

[29] *https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health - accessed 16 June 2021.*

	Policies	Action List	Time Frame	Reasons
HEALTH (H)				
H1		H1.8. Adopting more effective and rapid electronic exchange of monitoring data within the Ministry of Health and across other line-ministries for rapid intervention, ensure accessibility to real-time surveillance data necessary to investigate any climate change-induced pandemics	Medium Term	IO; R&D; CB
		H1.9. Adopting indicators that are essential for the protection of human health, such as air-quality and UV indicators, in partnership with concerned institutions.	Medium Term	IO, R&D
		H1.10. Using effective tools (e.g. GIS, health maps, IT systems) to link environmental, climate, and location factors to health results.	Medium Term	IO, R&D
URBAN DEVELOPMENT (UD)				
UD1	Enhancing the resilience of urban structure to climate change impacts and supporting sustainable urbanization	UD1.1. Supporting urban green infrastructure interventions for climate resilience (e.g. preserve natural watercourses, climate responsive building techniques, integrated land use planning, promote rainwater harvesting, establishing recreational parks, and integrating the use of shading elements (native trees) in walkways and streets).	Medium Term	IO; ID; PP; CB
		UD1.2. Improving readiness for climate related disaster risk reduction in urban areas to mitigate impact of extreme weather events on urban livelihoods.	Medium Term	UP; R&D
		UD1.3. Enhancing community participation at local urban level for climate change resilience (e.g. implementing existing local organizations and neighborhood networks to identify and respond to climate risks in urban areas based on participatory consultation, supporting joint actions, and mandating urban municipalities to lead community based initiatives for responding to climate risks through institutional restructuring and capacity development).	Medium Term	IO; SE; CB
		UD1.4. Improving building efficiency for adapting to increased heat in urban centers through enforcement of green building codes and enhancing retrofitting of existing buildings.	Medium Term	IO; ID; CB

	Policies	Action List	Time Frame	Reasons
COASTAL ZONES (CZ)				
CZ1	Improving the social, natural and economic resilience of coastal areas to climate change impacts	CZ1.1. Enhancing the sustainable use of marine protected areas for climate change adaptation (e.g. conduct site-specific research on the carrying capacity for critical and marine protected areas, and modification of management plans to include climate change adaptation measures).	Medium Term	IO; R&D; PP; CB
		CZ1.2. Build on recent scientific findings of distinguished resilience of coral reefs in the Gulf of Aqaba to climate change impacts and enhance scientific research in Aqaba as a global coral reef refuge.	Medium Term	IO; SE
		CZ1.3. Use of integrated coastal zone management (ICZM) within the broader ambit of sustainable land use planning for enhancing resilience of marine ecosystems (e.g. enhancing and strengthening awareness programs on climate change impacts on coastal areas, developing vulnerability assessment of ecosystems to extreme events at the Gulf of Aqaba, modify the climate change requirements in the EIA conditions for coastal development, create a central database, modify and enforce land use planning to protect marine environments).	Medium Term	IO; IC; SE, PP
		CZ1.4. Enhance coastal aquaculture as an alternative livelihood to exhausting fishing and develop approaches of integrated seawater culture joining mariculture and agriculture of crops tolerant to salinity (e.g. Sahara Initiative)		
		CZ1.5. Enhance the culture of light marine transportation: Marine Taxi / Bus along the Jordanian coast at less cost, less energy consumption and less emissions		
		CZ1.6. Improving monitoring capacities for the state of marine ecosystems (e.g. Enhancing current monitoring stations at Aqaba, strengthen database on coastal areas ecosystems, habitats and species, strengthen the early warning systems, and monitor sea level rise along the coast of the Gulf of Aqaba).	Medium Term	IO; IC; PP

	Policies	Action List	Time Frame	Reasons
CULTURAL HERITAGE (CH)				
CH1	Enhance the resilience of cultural and heritage values and assets to the detrimental impacts of climate change	CH1.1. Improving the preparedness of tangible and intangible cultural and heritage values and assets through climate change vulnerability analysis, risk assessment, and understanding the underlying causes of vulnerability and develop appropriate and systematic response system	Medium Term	UP
		CH1.2. Integrating culture-based measures, accumulated traditional knowledge and technologies in the adaptation programs/plans across the development sectors	Medium Term	SE
		CH1.3. Enhancing and capacitating the governance management system of cultural and heritage values and assets to allow proper coordination, collaboration, communication and knowledge exchange	Short Term	IO; IC; PP
		CH1.4 I Improving monitoring and mapping systems of the cultural and heritage sites to identify and integrate the climate change variable risks, and to inform the international conventions, agreements and systems.	Long Term	ID
IMPROVING ADAPTIVE CAPACITY (AC)				
AC1	Improving the adaptive capacity of social capital at national and local levels to climate change impacts	AC1.1. Integrating climate resilience in green economic recovery and development plans and initiatives through exploring innovative financing options for addressing climate adaptation and resilience projects and programmes.	Short Term	IO; SE, PP; CB
		AC1.2. Enhancing local adaptive capacity to climate change impacts through local climate action plans at municipality and/or district level (i.e. community participatory approach for planning and designing of local climate change adaptation (and mitigation) plans in coordination with local authorities), and through WASH to strengthen social cohesion and trust between community and water utilities in service delivery and community climate adaptation initiatives. Emphasis is placed on the inclusion of vulnerable groups as targets or beneficiaries for climate finance opportunities.	Medium Term	IO; SE, CB

	Policies	Action List	Time Frame	Reasons
IMPROVING ADAPTIVE CAPACITY (AC)				
AC1	Improving the adaptive capacity of social capital at national and local levels to climate change impacts	AC1.3. Integrating climate adaptation (and mitigation) into national poverty reduction policies through improving the existing social protection system to cope with climate change consequences for the most vulnerable segments of society; adopting poverty alleviation programs providing housing for poor people and supporting micro-projects for poor communities in light of unusual severe seasonal cold and hot weather conditions that prevailed in the last decade; and developing emergency relief and aid, etc.	Medium Term	IO; SE, PP; CB
		AC1.4. Mobilization of social capital for climate change adaptation through investment in youth in the present and as future decision makers and key stakeholders and as agents of change; enhancing capacity of Ministry of Social Development (MoSD), Ministry of Health (MoH) and Ministry of Education (MoE) staff to design and deliver climate resilient services to women and the poor; enhancing leadership capacity of community-based organizations (CBOs) to address climate change; developing an inventory of climate resilient traditional techniques in natural resources management in water and agriculture sectors and utilizing traditional knowledge for local adaptation measures.	Medium Term	IO; SE, PP; CB

2.2. CC Mitigation

The mitigation policies and actions (Table 3) support the mitigation policy statement of "to maintain the momentum towards carbon neutrality". The policies and actions are presented for the four main emitting sectors using the IPCC classification given in Table 3. In conjunction with the enabling factors, the proposed policies and actions must be sensitive to women, children and youth, and vulnerable groups. The mitigation policies and actions are not meant to be exhaustive, but to serve as guidance for developing coherent cross-sectoral mitigation planning. For instance, as new technologies develop and mature or the country development context changes, the enabling factors will need to be established to pursue the mitigation policy statement.

Table 3. Mitigation Policies and Actions.

	Policies	Action List	Time Frame	Reasons
ENERGY (Energy Uses, E)				
E1	Support the use of renewable energy and low-carbon fuels	E1.1. Reinforce the institutional and policy frameworks for renewable energy through the identification and implementation of policy de-risking instruments.	Short Term	IO; PP
		E1.2. Strengthen RE market development, including regulatory support, incentives for renewable energy in household, institutional and commercial settings (i.e. appropriate tariffs on rooftop solar PV) and for the development of new private business in this sector using optimum mix of financial de-risking instruments.	Medium Term	IO; PP; SE; HC
		E1.3. Continue the stimulation of renewable energy usage, taking into consideration vulnerable community groups	Short and Medium Term	PP; SA
		E1.4. Switch to low-carbon intensive fuels such as natural gas as a transitional option only and to avoid technology lock-in. The overall energy mix should be such that it contributes to the overall global objective of moving towards carbon neutrality by 2050.	Short, Medium and Long Term	IO; ID
		E1.5. Use of novel technologies based on technology needs assessments in all sectors (e.g. mini-grids for local communities or in peri-urban settings, carbon capture and storage in existing thermal power plants, hydrogen-fueled technologies etc…).	Medium and Long Term	HC; ID

	Policies	Action List	Time Frame	Reasons
ENERGY (Energy Uses, E)				
E2	Promote end-use energy efficiency	E2.1. Establishment and enforcement of standards and regulations on energy efficiency, in particular in energy intensive sectors such as manufacturing, oil extraction, mining, etc.	Short Term	SA; IC
		E2.2. Support energy efficiency (appliances and building envelope) in households through promotional initiatives and incentives (i.e. custom tax rebates on energy efficient technology) to encourage the use of innovative technologies.	Short and Medium Term	PP; IC; CB
		E2.3. Promote green energy and energy efficiency in industrial and commercial activities (e.g. mandatory energy audits, building energy codes, and energy efficiency standards).	Medium Term	ID; HC
E3	Improve energy infrastructure and access to electricity	E3.1. Enhance power network to decrease distribution losses (e.g. through smart metering and smart grids).	Medium Term	D; HC
		E3.2. Strengthen the national electricity supply network, including battery storage, pumped hydro schemes to accommodate increased penetration of variable renewables.	Medium to Long Term	ID; HC
		E3.3. Enhance cross-border interconnection projects with neighbouring countries as a prerequisite to include a larger share of RE in the grid.	Medium to Long Term	IO; ID; HC
		E3.4. Review electricity tariff system and incentive mechanisms for making renewable electricity more accessible to end users.	Short Term	IO; PP; SA
E4	Reduce the energy footprint in water supply systems	E4.1. Promote the use of new RE technologies for desalinization plants, water treatment and purification systems, and pumping and distribution services. This may include pumped hydro for energy storage.	Ongoing	UP; ID; HC; CB
		E4.2. Design, adopt, and incentivize the use of more efficient water distribution and supply systems using techniques such as piping optimization, reduction of network losses and using techniques like gravity driven supply systems, etc..	Ongoing	UP; ID; HC; CB

	Policies	Action List	Time Frame	Reasons
ENERGY (Transport, T)				
T1	Integrated land use planning to support sustainable land transport	T1.1. Enhance the use of integrated land use planning for achieving sustainable access to land transport, especially under the ambit of sustainable cities (e.g. developing low-carbon emission zones and transit-oriented development, etc).	Medium and Long Term	UP; HC; ID; PP
		T1.2. Develop physical infrastructure (e.g. bus rapid transit system, carpooling lanes, park-and-ride etc…) and accompanying incentives and communication strategies for promoting modal shift away from carbon-intensive models of transportation, especially in cities and on heavily congested/utilized trunk roads (e.g. airport road).	Medium and Long Term	UP; HC; ID; PP
T2	Promoting low-carbon modes of passenger transport	T2.1. Develop economic and financial incentives for the uptake of hybrid and electric vehicles in both public and private (e.g. households, commercial and industrial) transport.	Short Term	IO; PP; SA
		T2.2. Develop regulatory framework for taxation and fees on private vehicles based on carbon emissions.	Short Term	IO; PP; SA
T3	Fuel switch to decrease transport emissions	T3.1. Support research and development and promote the use of alternative fuels (e.g. biofuels, natural gas, LPG, fuel cells, hydrogen, etc..) in land transport.	Short and Medium Term	IO; ID
		T3.2. Adopt within maritime transport and aviation the recommendations of the International Maritime Organization (IMO) and International Civil Aviation Organization (ICAO), respectively.	Medium and Long Term	
T4	Increasing transport efficiency	T4.1. Adopt real-time adaptive systems to increase traffic fluidity.	Short Term	UP; IO
		T4.2. Incentivize and provide alternatives to work-related private passenger transport (e.g. carpooling, telecommuting, flexible work time, etc.) in connection with T1.	Short and Medium Term	IO; SA; PP
		T4.3. Optimize domestic air travel routes and use appropriate low carbon carriers.	Short and Medium Term	IO; SA; PP
T5	Promoting low-carbon freight transport	T5.1. Establish/upgrade the railway system infrastructure, and shift to electric in the long-run for transporting goods.	Medium and Long Term	ID; HC

	Policies	Action List	Time Frame	Reasons
WASTE MANAGEMENT (WM)				
WM1	Promote a circular waste economy	WM1.1. Enhance the national solid waste policy and strategic framework to develop a circular waste economy taking into account all waste management operations including: reducing waste generation, reuse, sorting at source, collection, transport, storage, recovery (materials and energy), recycling, treatment and environmentally-sound final disposal of waste, closure and subsequent follow-up on waste treatment facilities in violation.	Short and Medium Term	IO; IC; SE; SA; PP ; ID
		WM1.2. Develop the wastewater recovery network coupled with methane recovery for energy uses and composting of sludge.	Medium to Long Term	ID; HC
		WM 1.3 Methane recovery as per related global initiatives.	Medium to Long Term	PP; ID
Industrial Processes & Product Use IPPU (IP)				
IP1	Reducing greenhouse gases from industrial processes	IP1.1. Promoting the use of catalytic converters and other emerging technologies in the production of nitric acid.	Short to Medium Term	IO
		IP1.2. Engaging and incentivizing producers to introduce and use innovative techniques and technologies to reduce carbon dioxide emissions from cement production.	Medium to Long Term	ID; HC; SA
IP2	Promoting ozone and climate-friendly refrigerants	IP2.1. Develop policy framework for phasing down/out HFCs and HCFCs in alignment with the Kigali Agreement with the eventual transition to ozone and climate-friendly refrigerants.	Ongoing	IO; HC; SA; PP
Agriculture, Forestry & other Land Use AFOLU (AF)				
AF1	Promote good agricultural practices and indigenous methods as levers for mitigation	AF1.1. Promoting climate-smart agriculture using an agro-ecology approach.	Ongoing	UP; IO; SA; CB
		AF1.2. Enhancement of agricultural water-efficiency including the use of water dispensing technologies, traditional techniques for capturing, storing and conveying rain water, and plants/livestock that require less water and are more tolerant to heat.	Ongoing	UP; IO; SA; CB

	Policies	Action List	Time Frame	Reasons
Agriculture, Forestry & other Land Use AFOLU (AF)				
AF2	Enhancing restoration and conservation of biodiversity and sustainable land use co-benefits	AF2.1. Enhance afforestation and reforestation programs following an integrated approach to sustainable land use planning.	Ongoing	IO; SE; HC; CB
		AF2.2. Promote the conservation of ecologically sensitive areas (e.g. rangelands and wetlands), and develop appropriate legislation for their protection.	Ongoing	IO; SE; HC; CB
		AF2.3. Promote the restoration of ecologically degraded natural habitats in the coastal and terrestrial areas.	Ongoing	IO; SE; HC; CB
		AF2.4. Adopt the System of Environmental-Economic Accounting – Ecosystem Accounting (SEEA-EA) to carry out natural capital and ecosystem system accounting.	Short Term	IC; SE; PP; CB
		AF2.5. Promote urban green infrastructures (e.g. tree plantation and ecosystem restoration) as part of urban planning.	Short Term	IO; SE; CB
		AF2.6. Protect and promote marine carbon sequestration (i.e. blue carbon), coral reef restoration & development	Medium Term	R&D; IC; CB

3 Enabling Factors

Several enabling factors or drivers of change will be required to implement the adaptation and mitigation policies and actions detailed in Section 2.

3.1. Legal and Institutional Arrangements

As mentioned in the introductory section, Jordan is small country exhibiting a fairly complex, multi-level governance structure. The Climate Change Bylaw No. 79 of 2019 makes provisions for institutional arrangements, mainly at the national level, for carrying out stakeholder coordination related to climate change. It also lists the roles and responsibilities of stakeholders. In order to foster the principles of subsidiarity and inclusiveness (Principle 10) and partnerships (Principle 27), and to better define the roles and responsibilities of stakeholders as per the requirements of the PA, Table 4 proposes policies and actions to improve climate governance in Jordan. Institutional arrangements should allow for stakeholders to be coordinated in two distinct processes, namely: (i) processes related to UNFCCC initiatives (e.g. national communication, biennial update reports and nationally determined contributions) that are under the oversight of the National Climate Change Committee; and (ii) processes related to the formulation of sectoral adaptation and mitigation strategies and action plans. Plans to engage stakeholders in the two processes are likely to be distinct as well.

Table 4. Policies and actions for improved climate governance in Jordan.

	Policy	Action List	Time Frame	Reasons
LEGAL AND INSTITUTIONAL ARRANGEMENTS				
LI1	Improved legal framework for enhanced climate governance	LI1.1. Update the Climate Change Bylaw No. 79 of 2019 to: – stipulate the obligations, roles and responsibilities of institutions / stakeholders. – establish formal sectoral institutional arrangements for mainstreaming climate change in sectoral policies, strategies and action plans; – propose establishment of a Technical Advisory Body to support the National Climate Change Committee (NCCC); – formalize a stakeholder engagement mechanism at and below the Governorate level, as well as means to strengthen the participation of the private sector and vulnerable groups (e.g. children, women, youth, and people living with disabilities or in poverty).	Short Term	IO; IC, SE; UP; PP; CB

	Policy	Action List	Time Frame	Reasons
LEGAL AND INSTITUTIONAL ARRANGEMENTS				
LI1	Improved legal framework for enhanced climate governance	LI1.2. Update the Environment Protection Law no.6 of 2017 and amendments of all other related governmental sectoral policies, legislations, strategies, and action plans to mandate detailed vulnerability assessments to climate change (including climate variability and natural disasters) and accompanying adaptation and mitigation for infrastructure and land use change projects.	Short Term	IO; SE; UP; CB; PP; CB
		LI1.3. Strengthen laws & regulations such as creating legal code for defining the responsibilities of main emitters, introduction of extended producer responsibility, adoption of novel market-based tools to support adaptation and mitigation actions, defining the roles of all stakeholders in monitoring and evaluation of adaptation and mitigation contributions, among others.	Short to Medium Term	IO; SE; UP; CB; PP; CB
		LI1.4. Develop a Code of Corporate Governance for public interest entities to mandate sustainability reporting, including climate change (adaptation and mitigation).	Short Term	IO; SE; IC; PP; CB
LI2	Regulatory change to enshrine climate change	LI2.1. Initiate national dialogue for amending regulations to enshrine the government duty to address issues related to climate change to enhance the wellbeing of all.	Medium and Long Term	IC; SA; SE; PP; CB
		LI2.2. Capacity building of legislators and the judiciary on the implications of enshrining the government duty to address issues related to climate change to enhance the wellbeing of all, including vulnerable groups (see LI1).	Medium and Long term	IC; SA; SE; PP; CB
LI3	Improving stakeholder coordination for climate inclusiveness	LI3.1. Develop detailed Operational Guidelines for supporting institutions to carry out their obligations and responsibilities identified at LI1.1.	Short Term	IO; SE; UP; CB; CB
		LI3.2. Provide technical capacity building of stakeholders to fulfill their respective roles and responsibilities in relation to Operational Guidelines developed at LI3.1 following detailed capacity needs gaps analyses.	Short Term	IO, SE, CB, SE, CB
		LI3.3. Develop Stakeholder Engagement Plan (SEP) for engaging all key stakeholders (including children, women, youth, and vulnerable stakeholders) in dialogues on climate change and for the formulation of sectoral strategies, action plans and projects/programmes.	Short Term	IO; SE; UP; CB; CB

	Policy	Action List	Time Frame	Reasons
LEGAL AND INSTITUTIONAL ARRANGEMENTS				
LI4	Institutional strengthening of public institutions to integrate the function of climate change	LI4.1. Scale up efforts to establish and operationalize Climate Change Units / Directorates in public institutions, most notably line Ministries, particularly in the Ministries of energy, transport, local administration, water, agriculture, as well as, at governorates.	Short and Medium Term	UP; IO; IC; HC; PP; CB
		LI4.2. Human capacity building of Climate Change Units / Directorates following needs gaps analyses.	Short and Medium Term	UP; IO; IC; CB
		LI4.3. Establish a formal advisory body to the NCCC to enhance the science-policy interface based on LI1.1.	Short Term	IO; SE; UP; CB; CB
		LI4.4. Establish a work programme under the aegis of the NCCC that will culminate in the setting up of a formal institutional mechanism for taking the views of all groups in public decision-making related to climate change.	Short and Medium Term	UP; IO; IC; CB
LI5	Institutional strengthening for enhanced regional and international climate dialogues	LI5.1. Establish a work programme under the aegis of the NCCC that will enhance the capacity of Jordan to contribute to regional and international climate dialogues for enhanced climate governance.	Short and Medium Term	UP; IO; IC; CB

3.2. Technology Transfer and Financing

Jordan possesses certain national capabilities to implement the CC Policy 2022-2050, but it is recognized that these will not be sufficient to achieve the long-term policy objective and the policy vision. Table 5 and Table 6 show the policies and actions for Jordan to avail of the provisions made under Article 10 (technology development and transfer) and Article 9 (financing) of Paris Agreement (PA).

Table 5. Policies and Actions for Technology Transfer.

	Policy	Action List	Time Frame	Reasons
TECHNOLOGY DEVELOPMENT AND TRANSFER				
TT1	Developing and updating Technology Action Plans (TAPs)	TT1.1. Identify and prioritize (adaptation and mitigation) technologies including the accumulated traditional technologies for all adaptation and mitigation sectors using a participatory, inclusive multi-stakeholder process.	Short and Medium Term	IO; SE; UP; CB
		TT1.2. Carry out barriers analysis and detail the enabling environment for prioritized technologies.	Short and Medium Term	IO; SE; UP; CB
		TT1.3. Develop Technology Action Plans (TAPs) and use to formulate bankable proposals to attract international climate finance and financing from development partners and to update sectoral strategies and action plans.	Medium Term	IO; SE; UP; CB
		TT1.4. Update TAPs on a regular basis to inform the formulation of higher-level ambition NDCs and the continuing effort to attract climate finance.	Medium and Long Term	IO; SE; UP; CB
TT2	Institutional and human capacity strengthening for TT action planning	TT2.1. Capacity building on the TNA-TAP methodology and tools.	Short Term	IO; IC; SE; CB
		TT2.2. Institutionalization of TNA methodology and tools to develop TAPs through appropriate institutional arrangements.	Short and Medium Term	IO; IC; SE; CB

Table 6. Policies and Actions for Climate Financing.

	Policy	Action List	Time Frame	Reasons
FINANCING				
F1	Institutionalizing direct access and tracking flows of climate finance	F1.1. Develop budget tags and codes for tracking the allocation of climate finance in national budgetary process (including funds related to CC such as the Jordan Renewable Energy and Energy Efficiency Fund (JREEEF), Environment Fund, disaster funds etc …) at all levels.	Short and Medium Term	IO; IC; SE; CB
		F1.2. Establish a National Implementing Entity (NIE) for direct access to multilateral climate funds.[30]	Medium Term	IO; IC; SE; CB
F2	Institutional and human capacity strengthening for accessing international climate finance	F2.1. Develop a Climate Finance Policy and Strategy Framework.	Short Term	UP; IO; IC; SE; PP; CB
		F2.2. Enhance human capacity (public, private, CSO/NGOs, academia) to develop bankable proposals to attract international climate finance from multilateral (e.g. Green Climate Fund) and bilateral sources.	Short and Medium Term	IO; IC; SE; CB
		F2.3. Develop a pipeline of concept notes and proposals to increase preparedness to attract climate finance based on country priorities.	Ongoing	IO; IC; SE; CB
		F2.4. Strengthen donor / development partner coordination to match concept notes and proposals with potential sources of climate finance.	Ongoing	IO; IC; SE; CB
		F2.5. Leverage private sector participation and investments through public-private engagements.	Short and Medium Term	IO; IC; SE; CB

[30] *https://www.greenclimate.fund/document/gcf-brief-direct-access; https://www.adaptation-fund.org/apply-funding/implementing-entities/national-implementing-entity/ - accessed 16 June 2021.*

3.3. Education and Research, Awareness Raising, and Role of Media

Table 7. Policies and Actions for Education and Research, Awareness Raising, and Role of Media.

	Policy	Action List	Time Frame	Reasons
EDUCATION AND RESEARCH (ER)				
ER1	Integrating climate change in educational curricula at all levels	ER1.1. Strengthen the integration of the science of climate change, climate change adaptation and mitigation in primary and secondary school curricula, including adequate pedagogical tools for learning-by-doing and interactive approaches.	Ongoing	IO; IC; SE; CB
		ER1.2. Strengthen outreach of climate change (science, impacts, adaptation, and mitigation) in non-formal education to ensure that vulnerable children and young people (and any other individual) are not left behind.		
		ER1.3. Support the development of undergraduate and postgraduate courses in areas of climate change.	Ongoing	IO; IC; SE; CB
		ER1.4. Review and update / develop vocational training courses for supporting climate change adaptation and mitigation based on needs gaps analyses, in conjunction with the private sector.	Ongoing	IO; IC; SE; CB
		ER1.5. Support the establishment of environmental clubs within schools at all levels to incentivize students to participate in climate action.	Short and Medium Term	IO; IC; SE; PP ; CB
ER2	Enhance the science-policy interface for evidence-based public policy decision-making	ER2.1. Support provided to tertiary institutions for the development of poles of excellence in different areas of climate science, vulnerability assessments, mitigation scenarios analyses and technology development and transfer in coordination with the Higher Council for Science and Technology (HCST) and the Royal Scientific Society (RSS) and not-for-profit organizations (e.g. RSCN) to support the science-policy interface through the Climate Change Research Group (see LI4.3).	Short and Medium Term	IO; IC; SE; HC; PP ; CB

	Policy	Action List	Time Frame	Reasons
EDUCATION AND RESEARCH (ER)				
ER2	Enhance the science-policy interface for evidence-based public policy decision-making	ER2.2. Establish collaborations between local research institutions and regional and international counterparts to strengthen local institutional capabilities in all aspects of climate research.	Short and Medium Term	IO; IC; SE; HC; PP ; CB
		ER2.3. Establish a dedicated funding scheme for prioritizing research on climate change in support of the science-policy interface.	Short and Medium Term	IO; IC; HC; CB
		ER2.4. Encourage tertiary institutions to network with overseas research partners to access international research funding and to bridge gaps in climate research capabilities to enhance the national science-policy interface.	Short and Medium Term	IO; IC; SE; CB
AWARENESS RAISING (AR)				
AR1	Communication strategy on stakeholder outreach	AR1.1. Develop a communication strategy based on the Stakeholder Engagement Plan (SEP) and Women and Youth Action Plan developed at LI3.3 and GY1.2, respectively.	Short Term	IO; IC; SE; CB
		AR1.2. Carry out outreach activities to cover communication and awareness raising on all climate-related issues with stakeholders at all geographical levels of governance.	Short and Medium Term	IO; IC; SE; CB
AR2	Building partnerships for enhancing awareness on climate issues	AR2.1. Build partnerships between public, private, NGOs and CSOs to deliver the most effective and efficient sensitization campaigns at all levels.	Short and Medium Term	IO; IC; SE; CB
		AR2.2. Awareness raising among parliamentarians and legislators to enhance cross-sectoral integration of climate in public policies.	Short Term	IO; IC; SE; CB
CONTRIBUTION OF MEDIA (ME)				
ME1	Enhancing the role of the media as a conduit between decision makers and all stakeholders	ME1.1. Capacity building of journalists and influencers on the science of climate change, national vulnerabilities to the impacts of climate change, climate variability and natural disasters, and the sustainable development benefits of adaptation and mitigation	Short Term	IO; IC; SE; CB
		ME1.2. Establish focal points in traditional media outlets and engage them on a regular basis to communicate on all climate-related initiatives	Short Term	IO; IC; SE; CB

	Policy	Action List	Time Frame	Reasons
CONTRIBUTION OF MEDIA (ME)				
ME1	Enhancing the role of the media as a conduit between decision makers and all stakeholders	ME1.3. Enhance the capacity of government to utilize emerging digital media platforms to carry out large-scale outreach activities related to climate change to reach all stakeholders	Short Term	IO; IC; SE; CB
		ME1.4. Government to ensure that appropriate media and outreach approaches are used to target children, young people and other vulnerable groups that do not have access to traditional media or digital media	Short Term	IO; IC; SE; CB

3.4. Women, Children and Youth Mainstreaming

Women, children, and youth form a significant segment of the population, and they are disproportionately impacted by shocks, including the impacts of climate change, climate variability and disasters. Table 8 lists the policies and actions for mainstreaming gender and youth in climate governance, which are additional to the strengthening of stakeholder inclusiveness (Table 4).

Table 8. Policies and Actions for Women, Children and Youth Mainstreaming.

	Policy	Action List	Time Frame	Reasons
Gender and Youth				
GY1	Women and youth mainstreaming in climate change	GY1.1. Carry out Women, Children and Youth Analysis as part of baseline assessments when formulating sectoral climate strategies and projects/programmes in collaboration with relevant organizations.	Ongoing	UP; IO; IC; SE; CB
		GY1.2. Formulate Women, Children and Youth Action Plan for all sectoral climate strategies and projects/programmes in collaboration with relevant organizations.	Ongoing	UP; IO; IC; SE; CB
GY2	Institutional and human capacity strengthening for gender and youth mainstreaming in climate change	GY2.1. Enhance the human capacity of Ministries and Governorates with specialized focal person(s) dealing with women, children, and youth. Also, to propose best practices for institutional coordination in other institutions such as academia and private sector.	Ongoing	IO; IC; HC
		GY2.2. Capacity building of public and private institutions to carry out Women and Youth Analysis, and to develop Women, Children and Youth Action Plan for climate-related initiatives.	Ongoing	IO; IC; SE

4 Emerging Issues

The theory of change (Fig. 2) is built on several assumptions. These assumptions have been defined using a multi-tier taxonomy and present different levels of uncertainties. Since the Climate Change Policy 2022-2050 provides broad policy orientations only; the multi-tier taxonomy serves to highlight the need for considering several related issues when developing strategies and action plans related to the policy provisions given in the previous sections. The multi-tier taxonomy is detailed in Table 9.

Table 9. Taxonomy of assumptions underlying the Climate Change Policy.

Tier 1 Implicit assumptions	The policies and actions contained in the Climate Change Policy 2022-2050 contain a number of implicit assumptions: 1. Broad political support for its implementation and scaling up across all sectors and geographical levels of governance 2. The policy is not prescriptive to the letter, and it is understood that its implementation will take place using prevailing best practices at the time of implementation in terms of processes, methodologies and tools. For instance, it is understood that planning for adaptation will require vulnerability assessments to be carried out utilizing the most up-to-date results of climate impacts from downscaled climate models. It is also understood that the resolution of downscaling will increase with increasing human and technological capacity. Similarly, mitigation scenarios will be developed using prevailing carbon accounting standards and best practice methodologies and modeling tools 3. Also, the policy is hinged on the adoption of best practices in sustainable land use planning and management that has significant bearing on both adaptation (e.g. minimizing the effects and mitigation) (e.g. land transport, terrestrial sinks)

Tier 2 Emerging issues (known)	The implementation of the policy takes place in a dynamic context and there are a number of known emerging issues that need to be considered, such as: 1. Geopolitical stability is a known threat in the region, and historically, Jordan has experienced several waves of refugee influxes. The relatively high population growth rates in the last decade can be directly linked with the influx of refugees. The implementation of the policy should therefore consider the geopolitical situation, and develop different stochastic scenarios using the population of refugees as a variable. This is why Jordan has a role to play in supporting climate dialogues to strengthen regional climate governance conducive to the achievement of the objectives of the UNFCCC. Also, geopolitical stability is also needed to achieve the Green Corridor project. 2. It is also recognized that there is a need to integrate climate adaptation measures and responses to disaster risks.
Tier 3 Emerging issues (unknown)	The COVID-19 pandemic has revealed two fundamental issues related to policy planning that serve as valuable lessons for climate change policy planning. First, it has shown the extent to which an unexpected and unforeseen sanitary shock can be detrimental to human wellbeing and the economy, albeit exhibiting positive environmental impacts. Second, it has highlighted the extent to which nations are interconnected through the global economy. In light of these, several observations can be made: 1. Implementation of the Climate Change Policy 2022-2050 should use anticipatory approaches to develop scenarios, including worse case ones in order to test the resilience of socio-economic sectors and ecosystem functioning. Therefore, impacts of climate change and other risk factors such as natural disasters should not be restricted to the national territory only but also cover those in Jordan's import and export markets. 2. Since Jordan has high import dependence, its response to climate change, especially climate change mitigation that is highly dependent on imported technologies and fossil fuels, may be determinant on changes taking place in producer markets. Hence, there is a need to continuously scan for technological evolutions in external markets, as well as any disinvestments in the production and supply of fossil fuels as countries change modes of consumption and production in the face of climate change. 3. The transition to a carbon neutral and climate-resilient global economy gives rise to new opportunities in creating new local markets that can support green jobs, while at the same time delivering on all Sustainable Development Goals (SDGs).

5 Monitoring and Evaluation framework and Next Steps

Monitoring and evaluation (M&E) are proposed from two perspectives, namely: (i) actions to achieve the reporting requirements under PA, and (ii) tracking progress in implementing the CC Policy 2022-2050.

5.1. Reporting Requirements under the UNFCCC

With the Paris Agreement (PA) and its Article 13, the Enhanced Transparency Framework (ETF) for action and support was established. The modalities, procedures and guidelines (MPG) for Article 13 provide operational details on how to report on the information on national GHG inventories, tracking of progress of implementation and achievement of NDCs, climate change impacts and adaptation efforts, support provided and received for implementing the PA, and general functioning of the ETF. The policies and actions to achieve these reporting requirements are shown in Table 10, and will take place in conjunction with the relevant legal and institutional interventions in section 3.1. While the focus of the policy is on the requirements under the UNFCCC, the actions are supportive of cooperation and data sharing with other institutions such as the International Renewable Energy Agency (IREANA), the International Energy Agency (IEA) and United Nations Economic and Social Commission for Western Asia (UNESCWA), among others.

Table 10. Policies and actions to meet the reporting requirements under the Paris Agreement.

	Policy	Action List	Time Frame	Reasons
REPORTING REQUIREMENTS (RR) UNDER THE UNFCCC				
RR1	Enhanced Transparency Framework established and operational	RR1.1. Online portal for reporting on the implementation of adaptation and mitigation contributions in NDC, and support received is established building on existing multi-tiered integrated MRV system	Short Term	IO; SE; UP; PP; CB
		RR1.2. Capacity building of institutional stakeholders to use the online portal	Short and Medium Term	IO; SE; CB
		RR1.3. Human and institutional strengthening to produce Biennial Transparency Reports (BTRs)	Medium Term	IO; SE; UP; CB

5.2. Indicators for M&E of the CC Policy

The monitoring and evaluation of the policies and actions suggested in the CC Policy 2022-2050 take into account the economic, social and environmental – i.e. sustainable development - objectives of interventions, which would also contribute to a green economy. The process for the monitoring of progress is contained in an integrated policymaking approach, implying a systemic analysis for the understanding of cross-sectoral impacts of policy interventions in the short, medium and longer term. In this case, climate change interventions should be framed following a policy cycle that typically includes (1) the definition of issues (or agenda setting), (2) policy formulation, (3) decision-making, (4) implementation, and (5) evaluation. This is done by identifying issues and their primary drivers (agenda setting indicators), carrying out a cost-benefit analysis to evaluate policy and investment options (policy formulation indicators), and supporting integrated policy evaluation (policy evaluation indicators), as described below. A descriptive summary of the three types of indicators is given in Table 11, and Table 12 gives the M&E framework for the CC Policy 2022-2050, and that can be used to guide sectoral strategic action planning. The indicators used in Table 12 have been aligned with the National Environmental Indicators of the Ministry of Environment.

Table 11. Three types of indicators in M&E Framework.

Agenda setting indicators	Policy formulation indicators	Policy evaluation indicators
State of the environment and impacts of economic activity. 1. Indicators to identify issues related to the environment - such as water losses and GHG emission levels - resulting from economic activities, as well as from climate change impacts. 2. Indicators selected to best identify the problem and its (at times many and varied) causes.	***Policy cost and reach.*** 1. Indicators to assess the potential cost and performance of various interventions actions. 2. For CC adaptation indicators can support a cost-benefit analysis to evaluate the net investment required to improve climate resilience, as well as the economic savings (i.e. avoided costs and/ or added benefits) accruing over time. 3. For CC mitigation, it could be the abatement cost of CO2, and net savings from avoided energy use.	***Policy impacts on economic, social and environmental progress and overall human well-being.*** 1. Indicators to assess the success of policy interventions. 2. Indicators may include the overall progress of human well-being; improved resilience to climate change; economic gains (i.e. reduced costs from damages); and social advancements (i.e. jobs creation, poverty alleviation, social inclusiveness, women and youth mainstreaming).

Table 12. M&E Framework for CC Policy 2022-2050.

Sector	Problem	Indicator of issue identification	Indicator of policy formulation	Indicator of policy evaluation
Cross-sectoral indicators	1. Socio-economic impacts of climate change and policy-induced interventions	1. Number of persons impacted by climate change disaggregated by women, children, and youth (this indicator will be applied by all sectors)	1. Number and share of children receiving formal and non-formal education on climate change and responses. 2. Influence of children increased in design, planning and monitoring of climate action. 3. Number of young women and men supported in studies/ training on disciplines related to climate risk reduction measures/ environmental management. 4. Number of young women and men supported in climate adaptation and mitigation plans along with national poverty reduction policies and action plans.	1. Share and number of children with improved access to sustainable energy. 2. Share and number of children with decreased exposure to water or food insecurity and health-related hazards. 3. Share and number of children gaining access to adequate resilient infrastructure (water supply, sanitation, flood protection, housing, schools, energy access). 4. Inclusive green jobs created.
Agriculture	1. High vulnerability of agricultural yields due to climate change.	1. Loss of crop yield due to climate variability (ton/ ha/yr) 2. Precipitation variability (%). 3. Aridity Index, Rain concentration index, droughts severity and intensity).	1. Number of capacity building activities on climate resilient agriculture. 2. Investments in climate resilient infrastructure for agriculture (US$/year). 3. Amount of tax exemptions on climate resilient agricultural inputs (US$/year).	1. Increase in agricultural productivity (ton/ha). 2. Reduction in yield variability (%). 3. Number of food secure people (% of population).

Sector	Problem	Indicator of issue identification	Indicator of policy formulation	Indicator of policy evaluation
Agriculture	2. Soil erosion and land degradation	1. Agricultural soil loss or deterioration (ton/ha/yr). 2. Amount of fertilizer/ pesticides used (ton/year). 3. Average nitrate and pesticide concentration in surface and groundwater (mg/l).	1. Number of soil management plans implemented. 2. Proportion of crop area planted under responsible use plans (%). 3. Amount of tax exemptions on organic fertilizers, soil conditioners, and bio-pesticides (US$/year). 4. Investments on urban farming (US$/year)	1. Reduction of soil loss due to erosion (%). 2. Agriculture area under sustainable farming (ha). 3. Access to clean surface and groundwater resources (Quality) (%). 4. Sediment load in the water 5. Increase in land productivity (ton/ha/yr). 6. Carbon stock in soil (ton/ha) 7. Share of urban farming to agriculture GDP share.
	3. Inefficient use of natural pastures and reduced productivity and resilience due to overgrazing.	1. Livestock productivity (kg of meat/ha equivalent) 2. Overgrazing (% of pasture overgrazed) 3. Pasture reduction during drought periods (ha)	1. Area of pastures managed with proper charging (%). 2. Investment in training and dissemination of new technology (US$/year). 3. Number of capacity building programmes implemented on sustainable livestock production.	1. Reduction of GHG emissions per unit of product (tCO_2e/kg of meat). 2. Increases in livestock productivity (kg of meat/ha equivalent). 3. Livestock value added (% of GDP)
Water	1. Inefficient water use in agriculture.	1. Volume of runoff as a proportion of potentially available resources (m^3/ year). 2. Water losses from irrigation (m^3/year). 3. Agriculture water intensity (m^3/ton)	1. Amount of tax exemptions on the import of efficient irrigation systems (US$/year). 2. Amount of subsidies for rainwater harvesting in agriculture (US$/year). 3. Length of water pipes to be replaced (km). 4. Number of projects and initiatives implemented to enhance water use efficiency in water irrigation systems and in-farm irrigation techniques.	1. Provision of irrigation water from rainwater harvesting (%). 2. Share of water secure population (%). 3. Employment in water efficiency sector (person). 4. Water Use Efficiency (average ton/m^3 of water).

Sector	Problem	Indicator of issue identification	Indicator of policy formulation	Indicator of policy evaluation
Water	2. Water scarcity due to climate change effects and use.	1. Mean annual (seasonal) average rainfall (mm). 2. Volume of annual harvested water (MCM) 3. Volume of treated wastewater reused (m3/year). 4. Per capita domestic water consumption (m3/person/year). 5. Estimated losses from extreme events (US$/year).	1. Amount of tax exemption on water efficient technology for industrial, agriculture and residential use (US$/year). 2. Number of harvesting projects including urban areas. 3. Number of wastewater treatment plants established. 4. Investment in desalination plants (US$/year) 5. Non-revenue water loss reduction (%) 6. Investments for enhancing performance and efficiency of water utilities (US$/year). 7. Investments on emergency preparedness, mitigation, and recovery operations from extreme events (US$/year). 8. Enforcement of water laws and regulation to protect surface and groundwater systems 9. Investments on preservation, rehabilitation and restoration of watersheds (US$/year).	1. Water balance (water demand minus water supply). 2. Volume of reused wastewater and desalinated water (m^3/year). 3. Number of waterborne diseases (gender disaggregated) 4. Share of use from transboundary watersheds (m^3/year). 5. Number of Water User Associations. 6. Water bill at all end-users levels. 7. Number of flood and drought early warning systems. 8. Number of rehabilitated and restored watersheds. 9. Surface water and groundwater quantity and quality.
Energy	1. Rising energy costs due to heavy reliance on expensive fossil fuel.	1. Per capita energy bill (US$/person/year). 2. Fossil fuel use (% of total final energy consumption). 3. Fossil fuel subsidies (US$/year).	1. Share of renewables in energy production (%) 2. Amount of incentives to energy efficient appliances (US$/year).	1. Reduced costs of energy imports (US$/year). 2. Emissions from energy generation and consumption (tCO_2/year).

Sector	Problem	Indicator of issue identification	Indicator of policy formulation	Indicator of policy evaluation
Energy	2. Poor access to modern forms of energy in rural and peri urban areas.	1. Rural access to electricity (%) 2. Deforestation for energy purposes (ha/year). 3. Number of reported cases from carbon monoxide poisoning (person/year).	1. Investment in the expansion of national electricity grid (US$/year). 2. Incentives/investments to renewable energy mini-grids in rural areas (US$/year). 3. Number of capacity building programmes on renewable energy jobs in rural areas.	1. Increase in rural access to electricity (%/year). 2. Emissions from deforestation (tCO_2/year). 3. Employment in renewable energy sector (person/year). 4. Number of new business registration in the clean energy sector (number/year).
Transport	1. Un-sustainable access and mobility in land transport	1. Number of commuters using public transport.	1. Investment in transport infrastructure (e.g. bus rapid frequency (BRT), carpooling lanes, park-and-ride etc.).	1. Number of commuters using public transport. 2. GHG emissions from transport sector. 3. Percentage of fuel consumption (in tons per day).
	2. Aggravated transport of goods within the country and the surrounding region.	1. The volume of freight transport per unit of Gross Domestic Product (GDP).	1. Investment in establishing the railway national networks.	1. GHG emissions from transport sector (tCO2e/yr).
	3. Un-affordability of low-carbon modes of passenger transport	1. Number of hybrid and electric vehicles in both public and private transport. 2. Fuel consumption per type at the maritime transport and aviation.	1. Economic and financial incentives (US$/year). 2. Existence of regulatory framework for taxing private vehicles based on carbon emissions. 3. Investment in promote the use of alternative fuels.	1. Number of hybrid and electric (and other low-carbon) vehicles in both public and private transport. 2. GHG emissions from passenger transport and maritime transport and aviation (tCO2e/yr).
	4. Low transport efficiency	1. Number of commuters using private transport. 2. Volume of air travel routes.	1. Incentives for the reduced use of private passenger travel. 2. Investments in low-carbon carriers at domestic air travel routes (US$/year).	1. GHG emissions from domestic and air travel routes (tCO2e/yr)

Sector	Problem	Indicator of issue identification	Indicator of policy formulation	Indicator of policy evaluation
Forestry, Biodiversity, and Marine Environment	1. Insecure agro-biodiversity systems	1. Number of Impacted agro-ecological systems. 2. Number and type of ecosystem services provided.	1. Incentives/investments on conservation of "bee pastures". 2. Share of functional agrobiodiversity (FAB) subsidies in agricultural systems 3. Investments in conservation of environmental values and pest control.	1. Number of conserved environmental values and ecological focus areas. 2. Percentage of area impacted by pest and disease suppression.
	2. Low climate adaptive capacity in ecosystems	1. Number of protected areas and special conservation areas. 2 Percentage of biodiversity losses due to climate change impacts. 3. Percentage of degraded ecosystems. 4. Incidences of zoonotic diseases.	1. Investments in Ecosystem Based Adaptation (EbA) tools at protected and special conservation areas. 2. Investments on ecosystem rehabilitation and restoration, and combatting desertification. 3. Investments on establishing a Corporate Social Responsibility (CSR) plans for NGOs and local communities, and private sector engagements in biodiversity and ecosystem sectors. 4. Investments on developing a national plan for mitigating extreme events disaster risks (US$/year). 5. Investments on conservation measures for climate threatened species and habitats (US$/year). 6. Investments on habitats monitoring and spread of zoonotic infectious diseases (US$/year).	1. Number and area of protected and special conservation areas. 2. Count and distribution of fauna and flora species. 3. Size of rehabilitated and restored areas. 4. Percentage of degraded areas by desertification. 5. Share of NGOs, local communities, and private sector in biodiversity and ecosystem conservations. 6. Number of implemented Ecosystem Based Adaptation (EbA) tools and measures. 7. Number of persons infected by zoonotic diseases.

Sector	Problem	Indicator of issue identification	Indicator of policy formulation	Indicator of policy evaluation
Forestry, Biodiversity, and Marine Environment	3. Weak forestation planning.	1. Percentage of forest areas. 2. Number and frequency of wildfire cases. 3. Rate of deforestation (ha/yr).	1. Investments on forestation projects. 2. Development of forest protection framework. 3. Enforcement of forest protection laws.	1. GHG sink source inventories. 2. Percentage of forest area. 3. Number of rehabilitated forests. 4. Number and frequency of wildfire cases. 5. Rate of deforestation (ha/yr).
Coastal Zones	1. Weak resilience of social, natural and economic systems of coastal areas to climate change impacts. 2. Wasted energy in industrial cooling water.	1. Total losses from climate change impacts (US$/year). 2. Increase in sea level along the coast of the Gulf of Aqaba (cm/yr).	1. Investments to enhance the sustainable use of marine protected areas for climate change adaptation (US$/year). 2. Investments to support resilience of coral reefs to climate change impacts (US$/year). 3. Investment in local marine transportation. 4. Investment in alternative livelihoods to reduce the pressure on the coastal environment. 5. Investment in integrated mariculture and agriculture for establishing inland aquaculture. 6. Investment in desalination and other inland seawater use of the industrial cooling water. 7. Investments to improve monitoring capacities for the state of marine ecosystems (US$/year).	1. The cover area and condition of the coral reefs in Aqaba. 2. Physical and biogeochemical characteristics of sea water. 3. Fish availability and biodiversity. 4. Land-use and EIA status at Aqaba. 5. Number of created livelihoods to relief pressure off the coastal environment. 6. Amount of cooling seawater desalinated m^3 year.[1] 7. Quantity of marine organisms and agricultural products produced from integrated culture. 8. Number of early warning systems in place.

Sector	Problem	Indicator of issue identification	Indicator of policy formulation	Indicator of policy evaluation
Cultural Heritage	1. Poor understanding of the causes underlying the vulnerability of cultural and heritage values to climate change. 2. Potential economic, social, and symbolic loss of the degraded cultural heritage values and assets resulted from climate change.	1. Frequency of flash floods in several cultural and archeological sites. 2. Lack of climate change response plans and measures to climate change impacts on the vulnerable cultural and heritage values, particularly the sites of national and international importance.	1. Investments in the protection and rehabilitation of the important cultural and heritage values. 2. Number of institutions, financing and programs to protect and manage the important cultural and heritage values.	1. Number of climate change responsive measures to lessen detrimental impacts on the important cultural and heritage values. 2. Number of key development sectors integrating traditional knowledge and technologies within their adaptation programs. 3. Number of operational monitoring programs and mapping systems to track the impacts of variable climate change risks and inform the planning and management processes. 4. Number of capacity building programs and coordination mechanisms that contribute to strengthen the governance management system.
Waste	1. Unsustain-able circular waste economy.	1. Amount of produced/ treated/cycled/ reused solid waste (Ton/ year) per source and type.	1. Investments on enhancing the national circular waste economy taking into account all waste management operations (US$/year). 2. Investments on energy production from domestic and animal waste (US$/ year). 3. Investments on sludge and manure composting (US$/year).	1. Energy produced from waste (MW/year). 2. Amount of treated sludge and animal manure composting (Ton/year). 3. GHG emissions from waste sector (tCO_2/ year). 4. Quantity and types of wastes recycled and/or treated for environmentally-sound disposal.

Sector	Problem	Indicator of issue identification	Indicator of policy formulation	Indicator of policy evaluation
Urban	1. Weak urban green infrastructure interventions for climate resilience	1. Number of green buildings per city. 2. Percentage of recreational parks to city size. 3. Percentage of shading elements in walkways and streets. 4. Losses due to extreme events (US$/year).	1. Investments on urban green infrastructure and green building codes. 2. Interventions for climate resilience (US$/year). 3. Investments on Disaster Risk Reduction at urban areas (US$/year). 4. Investments on community participation at local urban level for climate change resilience.	1. Proportion of buildings and infrastructure adhering to climate change or environmental standards. 2. Number of climate change oriented organizations at municipal and neighborhood levels within urban areas. 3. Total annual losses and damage to infrastructure (US$/year)
Health	1. Lack of understanding potential risk on health sector	1. Availability of regional and local health vulnerability assessments especially at rural areas. 2. Inventory of SLCP and their human impacts.	1. Number of studies related to health impacts. 2. Investments on V&A analysis at regional and local scales (US$/year).	1. Number of health impact studies 2. Number and rate of hospitalizations for climate change impacts. 3. Number of illnesses, injuries, and deaths cases by causes.
	2. Weak public awareness about adverse impacts of climate change	1. Number of health care units. 2. Number of public health and climate change education programs.	1. Investments for public awareness on climate change health impacts and protective measures (US$/year).	1. Number of awareness programs. 2. Number of health care units that provide awareness services. 3. Number of illnesses, injuries, and deaths cases by causes.

Sector	Problem	Indicator of issue identification	Indicator of policy formulation	Indicator of policy evaluation
Health	3. Weak climate-informed disease control and surveillance systems	1. Number of illness, injury and death cases from direct and indirect climate change impacts. 2. Existence of effective monitoring and accessible forecasts to the public. 3. Existence of a health information system for climate change related diseases	1. Investments in developing health meteorological stations and early warning units (US$/year). 2. Investments on establishing of rapid electronic exchange network of surveillance data for rapid intervention (US$/year). 3. List of health indicators as related to environmental information. 4. Investments in spatial and temporal health delineation system tools (e.g. GIS or Health Mapper) (US$/year). 5. Investments in establishing emergency rooms (US$/year).	1. Percentage of civilians covered by the air quality monitoring units. 2. Number of health meteorological stations and early warning units. 3. Hospitalization cases related to climate change impacts. 4. Number of illness, injuries and deaths cases by causes.