Hashemite Kingdom of Jordan

Policy fiche: Managing the impact of climate change on agriculture

1. Context of the impact of climate change

Since its ratification of the United Nations Framework Convention on Climate Change (UNFCCC) in 1993 and the Kyoto Protocol, Jordan has embarked on a momentum to organize its national framework to combat the adverse effects of climate change and improve the resilience of the most strategic sectors to these changes in order to maintain and consolidate its development gains and to sustainably preserve its natural resources. During this process, special attention was paid to the economic activities and ecosystems most vulnerable to climate change.

Under the UNFCC, the initial communication was prepared in 1997 and the second one in 2009. Since then, several strategies to adapt sectors to climate change have been developed. In 2013, The National Climate Change Policy of the Hashemite Kingdom of Jordan 2013-2020 was developed and evaluated the current conditions of several sectors that will be affected by climate change and suggested practices and adaptation measures. The sectors included energy, transportation, solid waste and wastewater, land use and forestry, agriculture, water, biodiversity, health, coastal areas and tourism. As a result a special directorate for Climate Change has been established in the Ministry of Environment. After this milestone the third national communication to UNFCC on Climate Change was prepared (2014), Paris Agreement was ratified in 2015, the National Water Strategy for 2016-2025 was adapted and in 2017 was prepared the 1st Biennial Updated Report to UNFCC on Climate Change.

In accordance with the new Paris Agreement, the Government of Jordan declared in its Intended Nationally Determined Contribution (INDC), issued in 2015, its intention to reduce its greenhouse gas emissions by a bulk of 14 % until 2030. This contribution of GHGs reduction will be unconditionally fulfilled at, maximally, 1.5 % by the Country's own means compared to a business as usual scenario level. However, Jordan, conditionally and subject to availability of international financial aid and support to means of implementation, commits to reduce its GHGs emissions by additional, at least, 12.5 % by 2030.

Figure 1. Main milestones and dates of climate change in Hashemite Kingdom of Jordan

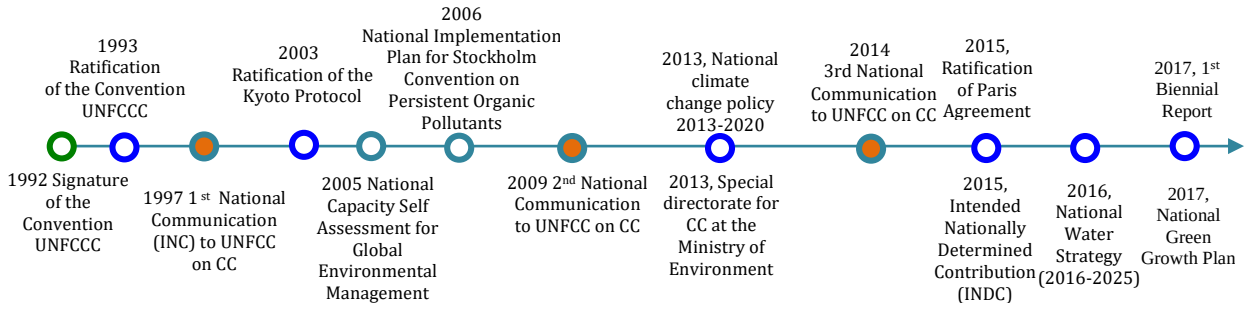

Table 1. "Evaluation board" of the impact of climate change

High impact (high impact, requiring major action and immediate action)		*Negligible impact (the impact is limited but requires follow-up)*	
Medium impact (increasing impact, requiring minor action, monitoring and medium-term action)		*Uncertain impact (not enough evidence and need for further monitoring and analysis)*	

Areas of impact	Currently (2017)		Near future (2020-2030)		Longer term (2030-2050-2100)	
Direct effects on costs Risks and insurance			Extreme weather events (i.e. extreme storms) may threaten cultivations, involving increased insurance costs			

			due to loss of insurability and business interruption costs.			
Climate variability	Historical climate trends since the 1960s include: - Rise in annual maximum temperatures of 0.3°–1.8°C and rise in annual minimum temperature of 0.4°–2.8°C across all regions (minimum temperatures rose at a faster pace than maximum temperatures). - Increase in the average number of heat waves across the country, particularly in the desert. - Increase in the number of consecutive dry days nationwide (highest in the desert, followed by the highlands and then the Jordan Valley). - Decline in annual precipitation by 5–20% across the country, except Ras Muneef in the highlands and Ruwaished in the Badia, where rainfall has increased by 5–10%.		Rise in annual maximum temperature of up to 4.1°C and rise in annual minimum temperature of 2.8°C by 2020 (warming is stronger during the summer). Some models project temperatures to rise evenly across the country while others suggest the increase will be strongest in the eastern and southern regions. - Increase in the frequency of heat waves. - Precipitation projections are highly variable but point to an overall decrease between 15–60 percent from 2011 to 2099		-Rise in annual maximum temperature of up to 5.1°C and rise in annual minimum temperature of 3.8°C by 2030 (warming is stronger during the summer). Some models project temperatures to rise evenly across the country while others suggest the increase will be strongest in the eastern and southern regions. - Increase in the frequency of heat waves. -10-day increase in the number of consecutive dry days from 2040–2070 (increase will be greatest in the southern Aqaba region). - Precipitation projections are highly variable but point to an overall decrease between 15–60 percent from 2011 to 2099.	
Direct effects on demand Water resources	Jordan is one of the most water-constrained countries in the world, with water availability levels far below the standard water poverty threshold of 500 m^3 per capita per year. Water levels per capita were 3600 m^3/year in 1946, but fell to 145 m^3/year by 2008 due to population growth and climate change. These will continue to fall to just 90 m^3/year by 2020 if no substantive action is taken to conserve existing resources and generate additional sources of potable water. This downward trend is alarming given that since 2014, demand for water outpaced supply by as much as 50 percent. Climate change will continue to have significant impacts on water scarcity in Jordan as a result of lower precipitation levels and rising temperatures. Both trends decrease water availability and quality by reducing runoff and creating environments conducive for microorganism and bacterial growth. The realities of supply deficits have put pressure on groundwater aquifers (which provide 70 percent of potable water), where recharge rates have been exceeded as a result of falling precipitation levels and surface water runoff. Transboundary river systems also exacerbate the challenges, as long-standing agreements with Syria and Israel have not been observed, leaving Jordan with less than 10 percent of the total flow of the Upper Jordan and Yarmouk Rivers, potentially causing further destabilization and conflict in the region.		Reduced surface water and groundwater resources and recharge rates Reduced water quality for industrial and household use Constrained agricultural and economic growth Increased regional tensions over water access			
Agriculture Production	Only 10 percent of Jordan's land is considered suitable for agricultural production, and predominantly lies in high rainfall areas of the highlands and the Jordan Valley. Rapid urbanization due to high population growth and domestic and		• Decrease in available soil moisture for crops in the rainfed areas • Increased crop water requirement • Increased crop/weed competition • More frequent drought			

	international population flows are forcing development into these areas. This is pushing production to marginal lands in the Badia region to the east and south, which suffer from drought and soil degradation. Climate change is expected to further stress these already marginal lands. Wheat and barley, the primary staple crops in Jordan, are especially susceptible to changing climate patterns. Barley yields in the Yarmouk Basin are projected to decrease 5–50 percent by 2050 due to reduced rainfall and higher temperatures. As rainfall declines and temperatures rise, Jordan's ability to maintain sustainable production levels of water-intensive exports such as fresh fruits and animal products becomes jeopardized. Invariably, this also forces increased dependence on imported food to meet domestic consumption demands. Although irrigated land accounts for only 33 percent of total cultivated area, the agriculture sector still consumes more than 60 percent of total available water resources.		• Decreased stream flow • Changes in rainfall intensity with more possible floods • Shortened growing season • Reduction in yield of rainfed and irrigated crops
Sea level rise and Coastal erosion			• Changes in coastal and marine systems, species and ecosystem services due to sea level rise, global warming and ocean acidification, with particular impacts on coral reefs and associated species
Vector borne-diseases			• Increased food insecurity and malnutrition
Energy	The energy sector was responsible for 73 percent of emissions. The waste, industrial processes and agriculture sector contributed 13, 9 and 4 percent respectively.		
Biodiversity loss			• Land degradation due to extreme weather events, natural hazards, and soil erosion that causes loss of soil fertility and agricultural productivity • Changes in water quality and quantity in inland freshwaters • Degradation of vegetation in watersheds due to climate change • Changes in terrestrial, inland wetland and coastal systems, their species and ecosystem services, due to changes in rainfall regimes and rising temperatures • Changes in growth rates, reproduction and geographic ranges of species and phenology of plants due to climatic changes
Infrastructural issues	• Increased flooding risk (plus mudslides and rockslides); damage to cultivations if protective structures not built.		• Coastal flooding and inundation during high sea level conditions
Greenhouse Gas (GHG) Emissions	In 2011 Jordan emitted 27 million metric tons of carbon dioxide equivalent (MtCO2e). Jordan's total greenhouse gas (GHG) emissions grew 59 percent from 1990 - 2011. In the same time period, gross domestic product (GDP) grew by 212 percent. Jordan's overall energy intensity of GDP is higher than most Middle East and North Africa countries.		• In 2013, Jordan developed its National Climate Change Policy 2013 - 2020. The main long-term objective of the policy is to achieve a proactive, climate risk-resilient country and remain a low carbon but growing economy. Jordan's Intended Nationally Determined Contribution states that Jordan aims to unconditionally reduce its GHG emissions by 1.5 percent by 2030 compared to a business as usual scenario.
Fisheries			Higher rate of livestock illness and death
Broader indirect effects Ecosystems			Changes in coastal and marine systems, species and ecosystem services due to sea level rise, global warming and ocean acidification, with particular impacts on coral reefs and associated species
Public Health	Limited access to clean water as a result of climate change is among the greatest threats to human health. Reduced rainfall levels, and drought in the most severe cases, reduce the replenishment rates of surface and groundwater systems, leading to lower water availability for human consumption. In response to concerns about water resources, the Jordanian government proposes to increase the use		Increased incidence of food-borne diseases (Salmonella and Shigella) through crop contamination Increased incidence of waterborne diseases (typhoid fever, cholera, Hepatitis A and E, giardiasis, bilharzia)

	of treated wastewater to supplement irrigation rather than rely on potable water. This solution is not without its risks, as poorly treated water can increase the risk of pathogen transmission, such as those carrying diarrheal disease and cholera. The reduced availability of water forces communities to resort to marginal or compromised reserves for household and agricultural use, increasing the risk from waterborne diseases. Declining agricultural production of Jordan's primary staple crops raises concerns about food security and malnutrition, particularly because Jordan already imports over 80 percent of its domestic food requirements. Access to affordable, nutritious foods will be out of reach for many communities living in Jordan, particularly displaced and other vulnerable populations, as a result of rising food prices.			
Coastal Zone			Changes in coastal and marine systems, species and ecosystem services due to sea level rise, global warming and ocean acidification, with particular impacts on coral reefs and associated species	
Livestock	Livestock products provide food and income for more than 250,000 Jordanians and comprise 58 percent of agricultural GDP revenue. Cattle and poultry rearing are primarily concentrated in the Badia, with some sheep and goat herding practiced in the highlands. Herd size is highly dependent on access to water and pastureland, and hence at risk to climate stressors. Declining rainfall levels and rising temperatures have reduced the availability of drinking water and the fertility of pasturelands for grazing. Barley yields, traditionally used as the dominant fodder for sheep, goats and other small ruminants, have fallen due to higher temperatures and rainfall variability. This decline in grazing lands has led to a shortage of feed by as much as 77 percent, causing imports to rise.		Loss of income and nutrition due to decline in livestock herds	

2. Policy options to address such impacts

How do the measures identified intend to address each specific impact? What outputs (documents) and outcomes (actions) are foreseen and by when?

Strategic Documents	Year & Agency	Objectives and consistency	How the approved measures will treat the different impacts
National Implementation Plan for Stockholm Convention on Persistent Organic Pollutants (POPs)	2006/MoE	• Prepare the ground for implementation of the Stockholm Convention • Assist Jordan in meeting its reporting and other obligations under the convention • Strengthen Jordan's national capacity to manage POPs and chemicals generally	• Enforce the available legislations, will result in mitigating the negative impacts of some practices • Enforce and enhance implementation of healthcare waste management regulation • Link the releases with the public health issues • Enhance and support reneable energy projects, rationalizing the energy use and encouraging the production and the use of clean fuel • Institutional and Regulatory Strengthening Measures • Measures to reduce or Eliminate Emission Production and Use
National climate change policy 2013-2020	2013/MoE	•To build the adaptive capacity of communities and institutions in Jordan, with consideration for gender and addressing the needs of vulnerable groups, to increase the resilience of natural ecosystems and water as well as agricultural resources to climate change, and to optimize •The national priorities and the pillars of	• Jordan takes a pro-active approach in exploring and accessing international funding for adaptation. • In parallel, the mobilization of national resources, including the national budget, to be strengthened. This includes the integration of climate change components in budget allocation. MoPIC to further develop its new approach for social and

		the Climate Change Policy are adaptation to climate change and mitigation of greenhouse emissions, with an emphasis on adaptation as the imperative track.	environmental accounting as a tool for supporting project selection and budget allocation; • Proposals for the Adaptation Fund to be prepared by specific sectors, and coordinated by the NCCC. Such proposals will also serve to gain experience with submission and evaluation of adaptation proposals for financing; • The National Adaptation Plan (to be developed) will further elaborate the strategies for financing adaptation in Jordan; and • The potential for Jordan to participate in the REDD+ (Emissions from Deforestation and Forest Degradation) system for afforestation to be explored
Jordan's Intended Nationally Determined Contribution (INDC)	GoJ 2015	• Highlighting Jordan's national commitment towards reducing greenhouse emissions at the national level, including mitigation and adaptation actions, to promote resilience of the national economy, society and natural systems to CC. • Outline of envisaged implementation means	Proposal of a number of targets (rather concrete) and actions (of general scope): a) Adaptation targets: establishes major initiatives, focusing on the water sector (National Water Sector Strategy, 2016), (versus) Promotion of CC adaptation, also focusing on vulnerable sectors such as agriculture, infrastructures and public health. b) Mitigation targets: (unconditional, without international support; and conditional, with international support). • Covering the sectors of energy, industrial processes and other products use, agriculture, forestry and land-use change, and waste.
National Water Strategy (2016-2025)	2016/Ministry of Water and Irrigation	• Economic efficiency in water use • Social equity • Environmental and ecological sustainability	• Because of the increasing scarcity of water and financial resources, the finite and vulnerable nature of water as a resource and the increasing demands upon it, water will be used with maximum possible efficiency. • All people to have access to water of adequate quantity and quality for sustaining human wellbeing will be recognized. • Use of resources will be managed in a way that does not undermine the life-support system so as not to compromise its use by future generations.
1st Biennial Report of Hashemite Kingdom of Jordan- United Nations Framework Convention on Climate Change	2017/MoE (supported by GEF,Royal Scientific Society,UNDP)	•To assist Jordan in the efforts of integrating climate change consideration into the national and development policies and to continue to build on the institutional and technical capacity strengthening process in the areas of Climate Change and National Communications reporting	• Updating the national circumstances and institutional arrangements relevant to the preparation of the national communications and biennial update reports. • Prepared GHG inventories for the years 2010 and 2012 using the UNFCCC 2006 guidelines and software. • Updating the mitigation actions and their impacts, including associated methodologies and assumptions, and the progress of implementation (using LEAP software). • Identifying constraints and gaps; related financial, technology and capacity building needs assessed; and recommendation for addressing the needs. • Support the establishment of a domestic Measurement, Reporting and Verification (MRV) arrangements.
National Green Growth Plan (NGGP)	2017/MoE (supported by GGGI	•The overall objectives of this project are to develop a national green growth strategy, with supporting action plans that enhance existing data deficiencies, action-plan recommendations, stakeholder engagement, and sharing of expertise	• Identifying green growth opportunities and Green Key Performance Indicators to be included in the NGGP • Designing a cross-sector green growth policy framework and implementation roadmap • Facilitating institutional and stakeholder engagement to provide a platform that will

			attract long-term financing • Facilitating knowledge-sharing activities in support of sector strategies

Elaboration of the policies and measures and advancements

The Ministry of Environment (MoE) is the focal point to the UNFCCC, and has been participating in international climate change discussions as a state committed to contribute to the global efforts to reduce GHG emissions. Financially supported by GEF, and assisted in management by the UNDP, the MoE has executed work regarding the completion of the national communication reports (1997, 2009 and 2014) and INDC, as well as Biennial Update Report (2017). The MoE has also established multi-stakeholder structures and bodies (e.g. National Council for the Environment) to involve relevant stakeholders into the national CC strategy and in 2013 established a special directorate for CC in the Ministry

What are the main steps followed and what is the stage of the process?

Strategic Documents	Leader	Process	Main actors associated in the process
National Implementation Plan for Stockholm Convention on Persistent Organic Pollutants (POPs)	MoE	Was prepared in the form of UNEP's Project No. "GF/2732-02-4495LRev.01" that is entitled "Enabling Activities for the Development of a National Plan for Implementation of the Stockholm Convention on POPs"	Sectoral stakeholders (Most of the Ministries engaged)
The National Climate Change Policy (NCCP) of the Hashemite Kingdom of Jordan 2013-2020	2013 Ministry of Environment Supported by Global Environment Facility (GEF) and the United Nations Development Programme (UNDP)	National Committee on Climate Change has voted, in June 2012 to develop a national climate change policy (17 votes against 2). Process is based on multistakeholders consultation (large participation) Negotiator: MoEnv Focal point. Advocate: Process coordinator. Planner: national consultant Facilitator/ compromiser international consultant 10 thematic groups consultations (each with 10-15 members). 01 large kick-off meeting, 01 verification workshop and 03 drafts edited by all stakeholders.	The policy was a result of an extensive multi-stakeholder dialogue process that involved all active organizations from various sectors in Jordan. The policy was drafted to accommodate all national climate change priorities for action and to provide a highly flexible policy reference point upon which further strategies and sectoral policies can be based.
Third National communication of CC (TNC) (UNFCCC)	2014 Ministry of Environment Supported by UNDP & GEF, IUCN.	The process of developing the TNC report has involved all national stakeholders and experts in a two-year effort supported by GEF and UNDP and using the best available guidelines. The TNC was produced through the use of national expertise, with international support in the area of climate projection downscaling. The capacity building components of the TNC have helped to increase national capacity to produce national reports in a sustainable manner and with the best scientific quality. The knowledge created and generated within the TNC process will drive further research and enhance the information base for all stakeholders for years to come.	The process of preparing the TNC report included the participation of tens of national institutions and hundreds of experts, professionals, researchers, activists and other members of the CC community in Jordan. Data availability and sources of information were the key factor for preparing the TNC, in particular the Ministry of Water and Irrigation and the Jordan Meteorology Department for providing the project with comprehensive historical data of climate indices. Special thanks are also extended to the members of the National Committee for CC which has provided the project with all needed information and documents. The cooperative feedback from national institutions involved in the project as sources of GHG emission data. The project has benefited from the highly skilled technical support provided by the national consultant organizations working in the Mitigation and Adaptation sectors, in particular the Royal Scientific Society and the IUCN Regional office for West Asia.
National Strategy and	Ministry of	• Leapfrogging to socially inclusive	Lake in consideration regional Action

Action Plan for Sustainable Consumption and Production 2016 – 2025	Environment. 2016 supported[1] by SCP RAC, UNIDO, MAP/UNEP	Sustainable Consumption and Production practices preserving the environment; • Integrating the natural capital and the environment in the core business of Mediterranean companies • Creating a critical mass of citizens for SCP	Plan: as most Tourism activities in the country are taking place on the coastal areas of the City of Aqaba. This SCP NAP is in-line with provisions of the ICZM Protocol in particular its Article 9, which identifies tourism, sporting and recreational activities as a key economic activity in the framework of the Protocol.
National Water Strategy (2016-2025)	Ministry of Water and Irrigation	This strategy builds on the previous strategic documents which helped to shape the management of the water sector in Jordan over the past 20 years. Investment program and action plan was developed for the years 1997-2010 and updated in 2002 to extend until 2011. This strategy is in alignment with the royal initiative for economic change in all sectors that was formulated in the nationally adopted document" Jordan 2025, A National Vision and Strategy" in 2015.	The strategy included provisions for climate change, water-energy-food nexus, and focus on water economics and financing, sustainability of overexploited groundwater resources and the adoption of the new technologies and techniques available including Decentralized Wastewater management, increased needs for utilization of surface water in municipal supply, reuse of treated wastewater. It incorporate more decentralization, commercialization and consolidation of water and wastewater services as well as increasing private sector participation, the changes in legislation and it is in line with the new strategies adopted in other sectors including National Energy Strategy 2007-2020 adopted by the Royal Energy Commission, "Agriculture Document of 2009" issued by the Ministry of Agriculture and environmental policy and plan of action developed by the Ministry of Environment, Strategy documents for health, education and municipal affairs also reflect synergies and partnership with the water sector and the new updates of water wastewater management master plans, solid waste management and the newly approved reform legislation including the decentralization law.
INDC	2015	Large consultation process among technical interested parties	Energy, transport, waste, environment

Which actors were involved, how and at what stage?

- Coordination and conduction of work regarding climate change is in charge of the Jordan Ministry of the Environment. This responsibility also concerns the implementation of the UNFCCC guidelines and requests, i.e. completion of the national communication reports and biennial reports (until now, 1997, 2009, 2014) and the Biennial Report (2017).
- The Ministry of Environment is the main national coordinator for climate change and the UNFCCC focal point. The Ministry chairs the National Council for the Environment (NCE). The NCE is mandated to approve environmental policies and strategies and integrate environmental concept, including climate change issues, into national development plans.
- The National Committee on Climate Change is mandated to monitor the progress in the implementation of the Climate Change Policy on the national level and thus the INDC. A large share of the objectives of the Policy will be implemented through sector strategies under the responsibility of the sector's ministries (energy, water, agriculture, health, and others).
- The Government of Jordan committed to developing a National Green Growth Plan (NGGP) that is in line with national objectives of economic, social and environmental performance. GGGI partnered with the Ministry of Environment (MoENV) and the federal Ministry for the Environment of Germany to support the development of the NGGP.

3. Cross-analysis: policy options and climate impacts

[1] SwitchMed Programme is funded by the European Union

The analysis of the relevance and coherence of Hashemite Kingdom of Jordan's action to fight against climate change is based on two strategic documents, the National Climate Change Policy 2013-2020 and the National Water Strategy (2016-2025).

Table 2. Agriculture and climate change "cross analysis sheet"

Fully considered		*Weakly considered*	
Consider the key components		*Do not consider or no specific knowledge*	

Areas of impact	National Climate Change Policy 2013-2020		National Water Strategy (2016-2025)	
risks and insurance			• Introduction of insurance services for climate-related damage in agriculture, with a particular focus on small farmers	
Climate variability	• Consider climate variability as an essential basis of the CC specific adaptation strategy.. • Appointment of an interministerial National Climate Council to improve the coordination of measures for adaptation to climate change		• Consider climate variability in spatial and temporal planning in development • Promotion of interdisciplinary climate research and development of appropriate training programmes	
Water Resources	• Incentives for water conservation, reuse of treated wastewater and rainwater harvesting • New national development plan taking into account the CC • National and Regional Natural Resources Councils • Transformation of the right of ownership of water in right of use • Modifications of existing works, subject to authorization and perimeter of prohibition. •		• Strengthen the water saving policy • Reuse of treated wastewater and rainwater harvesting • Development of a climate label for agricultural products which are particularly resilient to the impacts of climate change	
Agriculture Production	• Better enforcement of existing water and agricultural ordinances		Increased crop water requirement	
Sea level rise and Coastal erosion	Changes in coastal and marine systems, species and ecosystem services due to sea level rise, global warming and ocean acidification, with particular impacts on coral reefs and associated species		• Assistance with the restructuring of farms that are affected by climate change	
Vector-borne diseases	• Degradation of water and coastal resources, flooding of land with consequences on socio-economic activities (agriculture, tourism, town planning, port infrastructures, etc.), health risks linked to the emergence of certain vector-borne diseases.			
Energy	• Regulation for opening of the national electricity grid to the production of renewable energy by the private sector • Territory energy / climate plan • Urban displacement patterns • Rail transport to inland areas • National GHG reduction quota system (companies / regions)		• Reduce the vulnerability of agriculture to energy prices, to the "carbon constraint" by limiting its dependence on fossil fuels and reducing its CO2 emissions. • Development of renewables energy production	
Biodiversity loss	• National Council (CNRN) & Regional Councils for Natural Resources (CRRN) • Agricultural water pricing system reflecting the scarcity of the resource • Incentives for the development of low-impact export crops		• Reduce the vulnerability of agriculture by limiting its dependence on resources and fertilizers likely to deteriorate and by valuing less vulnerable resources;	
Infrastructure problems	• Consider vulnerability and adaptation in the regionalization of Jordan • CC taken into account in the National Plan of Development and Urban Development Plans • Buildings and infrastructure take climate risks into account (do not impose prohibitive additional costs).		Review urban development	
Greenhouse Gas (GHG) Emissions	• Achieve a proactive, climate risk-resilient country and remain a low carbon but growing economy		Achieve a proactive, climate risk-resilient country and remain a low carbon but growing economy	
Fisheries	• Fishing and fisheries is an additional 'highly vulnerable' issue in Pordan			
Ecosystems	• Broader-based collection of climate and water resource data to improve the quality of forecasting			
public health			Increased incidence of waterborne diseases (typhoid fever, cholera, Hepatitis A and E, giardiasis, bilharzia)	
Coastal Zone	• Integration of CC Requirements into Urban			

	Planning Plans			
Livestock	• Higher temperatures have also increased the incidence of livestock diseases and parasitic infestations such as toxoplasmosis and brucellosis. As livestock are the second largest export by both volume and value, any impacts on the sector have a significant effect on the economy as a whole		Maintain surface water systems and pastureland for drinking water and grazing Reduce the vulnerability of agriculture by limiting its dependence on resources and fertilizers likely to deteriorate and by valuing less vulnerable resources to minimize rates of livestock illness and death	
Decline of landscapes	• New national development plan taking into account the CC •		Reduce the vulnerability of agriculture by limiting its dependence on resources and fertilizers likely to deteriorate and by valuing less vulnerable resources;	

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