



ANNEX 6: ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

7 July, 2020

**BUILDING RESILIENCE TO COPE WITH CLIMATE CHANGE IN JORDAN THROUGH IMPROVING WATER
USE EFFICIENCY IN THE AGRICULTURE SECTOR (BRCCJ)**

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LIST OF ACRONYMS

AE	Accredited Entity
BH	Budget Holder
BRCCJ	Building Resilience to Cope with Climate Change in Jordan
CADRI	Capacity for Disaster Reduction Initiative (CADRI)
CC	Climate Change
CCA	Climate Change Adaptation
CCCC	Coordination Commission on Climate Change
CSO	Civil Society Organizations
CTA	Chief Technical Adviser
CWW	Climate Wise Women
DRR	Disaster Risk Reduction
DSSAT	Decision Support System for Agrotechnology Transfer
EE	Executing Entity
ESA	Environmental and Social Analysis
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Safeguards
FAO	Food and Agriculture Organization of the UN
FFS	Farmer Field Schools
FNC	Fourth National Communication
GAP	Gender Action Plan
GCF	Green Climate Fund
GDP	Gross Domestic Product
GDI	Gender Development Index
GEF	Global Environment Facility
GGI	Global Green Growth Institute
GHG	Greenhouse Gas Emissions
GII	Gender Inequality Index
GIZ	<i>Deutsche Gesellschaft für Internationale Zusammenarbeit</i>
GPS	Global Positioning System
HDI	Human Development Index
HH	Households
HU	Hashemite University
ICARDA	International Centre for Agriculture in the Dry Lands
ICT4CA	Information Communication Technology for Climate Adaptation
IFAD	International Fund for Agricultural Development
ILO	International Labour Organization
INDC	Intended Nationally Determined Contribution
JGBC	Jordan Green Building Council
JOHUD	Jordan Hashemite Fund for Human Development
JRD	Jordan River Foundation
JMD	Jordan Metrological Department
JUST	Jordan University of Science and Technology
JVA	Jordan Valley Authority

JWA	Jordan Water Authority
M&E	Monitoring and Evaluation
MCM	million cubic meter
MOA	Ministry of Agriculture
MoE	Ministry of Environment
MoPIC	Ministry of Planning and International Cooperation
MoU	Memorandum of Understanding
MPI	Multidimensional Poverty Index
MWI	Ministry of Water and Irrigation
NAF	National Aid Fund
NAMA	National Appropriate Mitigation Actions
NAP	National Adaptation Plan
NARC	National Agricultural Research Centre
NCCC	National Climate Change Committee
NDA	National Designated Authority
NGO	Non-governmental Organization
ND-GAIN	Notre Dame Global Adaptation Initiative
NRW	Non-Revenue Water
NPV	Net Present Values
NRM	Natural Resource Management
PMF	Performance Management Framework
PMU	Project Management Unit
RCP	Representative Concentration Pathways
RNE	Regional Office for Near East
RSS	Royal Scientific Society of Jordan
RWH	Rainwater Harvesting
SDG	Sustainable Development Goals
SNC	Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC)
TA	Technical assistance
TNC	Third National Communication to the United Nations Framework Convention on Climate Change (UNFCCC)
TORs	Terms of Reference
TWG-A	Technical Working Group - Adaptation
UN	United Nations
UNCCD	UN Convention to Combat Desertification
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNFCCC	UN Framework Convention on Climate Change
USD	United States dollar
WUE	Water Use Efficiency
WSP	Waste Stabilization Ponds
WSPL	Water Sector Policy Loan
WW	Waste water
WWTP	Waste Water Treatment Plants

EXECUTIVE SUMMARY

One of the most water scarce countries in the world, Jordan is facing severe climate change risks: climate change has exacerbated water scarcity in the country, impacting both rural and urban household safety and health, livelihoods, and sustainable development. Jordan's vulnerability to climate risks has been aggravated by more erratic rainfall patterns, increased temperatures and an unprecedented population increase. Some country sectors are particularly vulnerable to climate risks, such as agriculture; 61 percent of the cultivated land is rainfed. Given the reported exposure, vulnerability and adaptation deficit, four Governorates in the Dead Sea Basin (Karak, Madaba, Talifah and Ma'an) have been selected for project interventions. The project will support the objectives of Jordan's climate change policy (2013-2020) by building the adaptive capacity of communities and institutions, addressing the needs of vulnerable groups, and increase the resilience of water management systems as well as that of the agricultural sector to climate change.

The "Building resilience to cope with climate change in Jordan through improving water use efficiency in the agriculture sector (BRCCJ)" **Category B project will ensure that this Environmental and Social Management Framework (ESMF) is adhered to, and its sections used as guidance for the preparation of Environmental and Social Management Plans (ESMPs).** In accordance with Jordan's Environmental Impact Assessment Regulation No. 37 of 2005, BRCCJ activities do not fall under Annex 2 or Annex 3 projects. This ESMF constitutes the initial environmental impact assessment as per Annex 1, and notes that BRCCJ project sub-activities will undertake - once specific target activity areas have been identified, and activities fully defined - further environmental and social impact assessments, where FAO and/or national environmental impact assessment standards/regulation will be followed, whichever is most stringent. **This ESMF identifies the ESS policy triggers for the project, the potential environmental and social impacts of project activities, and measures to mitigate the identified risks.**

FAO will establish a Project Management Unit (PMU) within the Ministry of Environment. **An Environmental and Social Safeguards (ESS) Specialist will be hired, within the PMU,** for the duration of the project. A total budget of USD 175,000 has been allocated for the salary of this person. The ESS Specialist will be responsible for ensuring overall compliance with this ESMF, including presenting and explaining the ESMF (including grievance redress) to all stakeholders during consultations, and the overall oversight of mitigation for any medium-risk activities using ESMPs developed during implementation. The ESS Specialist will receive support from the project's Gender and Social Development Specialist and Gender and Climate Change Adaptation (CCA) Specialist. The ESS Specialist will also work closely with the Monitoring and Evaluation (M&E) unit, and the Gender and Social Development Specialist, on matters related to reporting for the ESS and stakeholder engagement aspects of the project. **Major elements of the workplan** for the implementation of this ESMF include capacity building of project staff and implementation partners, ESS screening and assessment, stakeholder engagement, Gender Action Plan, and monitoring and reporting. **Project costs of relevant staff** are below.

Costs description	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	USD total costs
ESS safeguard specialist	25,000	25,000	25,000	25,000	25,000	25,000	25,000	175,000
Social Inclusion and Gender Specialist	25,000	25,000	25,000	25,000	25,000	25,000	25,000	175,000
Expert on Gender and Climate Change Adaptation Specialist	45,000	0	0	0	0	0	0	45,000
Allowances Gender and Climate Change Adaptation Specialist	10,800	0	0	0	0	0	0	10,800
Allowances of ES safeguard specialist and others	10,962	10,962	10,962	10,962	10,962	10,962	10,962	76,734
FAO technical assistance	0	20,000	20,000	20,000	20,000	20,000	0	100,000
FAO technical assistance to the PMU	10,714	10,714	10,714	10,714	10,714	10,714	10,714	75,000
TOTAL	127,476	91,676	91,676	91,676	91,676	91,676	71,676	657,534

Positive impacts of the project will be efficient water use, more efficient and effective water harvesting and the use of non-conventional water sources, building adaptive capacity of farming households, and economic diversification. Rainwater harvesting (RWH) has long-term impacts on local water resources by reducing demands for surface and groundwater withdrawals, contributing to the recharge of aquifers, and preventing floods and soil erosion. It also protects the integrity of local water resources by reducing non-point source pollution. Advantages of including RWH in national water supply plans is that it offers an alternative and sustainable water source which saves water and energy; RWH structures are relatively easy to maintain, and reduce water bill costs as the quality of rain water can be used as a primary source for specific uses. Rooftop RWH structures provide a source of water for areas that are otherwise poorly served. The installation of water savings devices can have significant water saving results of up to 30 percent. Greater storage and use of reclaimed wastewater (WW) are expected to generate ecological benefits by reducing the volume that is discharged to rivers, increase awareness of the water cycle and fostering an ethic of water conservation. With respect to ecosystem health, the reuse of treated WW decreases the use of scarce freshwater for irrigation, increasing water supply for aquatic ecosystems. It decreases unsafe use of WW for irrigation and contributes to decreased incidence of environmental pollution. Irrigation using treated WW can potentially reduce the need of fertilizer. Institutions and communities will be supported in the development and uptake of climate resilient water systems by developing climate resilient landscape investment plans. Climate smart agricultural practices will enable farmers, communities and water users – with a focus on women - to adapt to climate change. Irrigation technology, RWH and soil management, domestic use of water, organization and management of the dissemination of key technologies, budgeting and business plan development are included in training activities.

Potential negative impacts are mitigatable, and are mainly related to construction works for rooftop RWH structures, and storage and distribution infrastructure for the reuse of reclaimed water from Waste Water Treatment Plants (WWTP). These impacts can be of physical nature (involving design and construction practices). Other potential impacts during construction works are related to Operational Health and Safety Risks (OHSR), and human health (e.g. construction material used). Examples of social risks could be related to non-engagement of stakeholders, and exclusion of some farmers resulting from development of a strategy for subsidizing the use of drought-tolerant (locally climate-adapted) seeds. Pesticide use is not envisaged, and Indigenous Peoples are not present in the project area; both these are, however, accounted for in the ESS mitigation plan of this ESMF. **FAO Safeguards that are applicable for BRCCJ** are presented below.

FAO Safeguard	Applie s	Justification
ESS1: Natural Resource Management	Yes	This Safeguard was triggered because of water related activities. Water harvesting structures will be built at the household level, and on public buildings. Irrigation schemes will be improved. The project provides supplemental water to existing irrigation schemes, whose size is likely to be equal or slightly greater than 20 hectares. Irrigation schemes may possibly be expanded., but this will <i>not</i> involve fresh or groundwater extraction; interventions are linked only to reclaimed water. The project will use wastewater: a priority of GoJ, activities are in line with national standards. Wastewater for agricultural purposes, however, will not be taken from industrial sources, and will be used on non-direct consumption crops (i.e. fodder and tree crops).

ESS2: Biodiversity, Ecosystems and Natural Habitats	No	Not applicable.
ESS3: Plant Genetic Resources for Food and Agriculture	Yes	Seed will be provided; these are drought-resistant crop varieties that have historically been present in Jordan but are now in disuse. They have since been tested through NARC research, and patented (MOA).
ESS4: Animal - Livestock and Aquatic - Genetic Resources for Food and Agriculture	No	Not applicable.
ESS5: Pest and Pesticide Management	No	The project will not lead to increased use of pesticides through intensification or expansion of production. Should, however, this occur, the project already works through FFS, and IPM practices would be promoted. ¹
ESS6: Involuntary Resettlement and Displacement	No	Not applicable.
ESS7: Decent Work	Yes	The project operates in target areas with high incidences of poverty – these persons are project beneficiaries. It also operates in situations where major gender inequality in the labour market prevails; inclusion of women (and also youth) is a major project aspect and the Gender Action Plan addresses this. Workers will be employed - in line with national legislation and/or UN/FAO regulation, whichever is most stringent. Training will be provided on operations, and Operational Hazards and Safety Risks.
ESS8: Gender Equality	No	Gender equity will be addressed in project design/activities and the Gender Action Plan.
ESS9: Indigenous Peoples and Cultural Heritage	No	Not applicable. This was confirmed by FAO's Indigenous Peoples unit who informed that it is unlikely that the target governorates host indigenous peoples; It is considered that the project activities will not affect indigenous peoples. Prior to implementing field level activities, a review will be undertaken to confirm that. Should it be found that indigenous peoples are affected, the process of Free, Prior and Informed Consent will be applied.

At the time the project was first conceived, a range of activities were put forward, and project areas were not concretely identified. During the course of project elaboration, **key stakeholders, local communities and government agencies dealing with the water and agriculture sectors in Jordan were consulted in workshops, detailed meetings and field visits.** During workshops, feedback was received on national priorities including gender equality and empowering women, MOA research with regards to drought-tolerant seeds, and the use of treated wastewater from existing wastewater treatment plants. The range of the project area was considered an issue to be discussed; the project area was then scaled down from three to one site (Dead Sea Basin). Other key risks and impacts identified concerned streamlining activities with national priorities, in particular the Jordanian National Adaptation Plan. It was decided that the focus

¹ If IPM and/or PMP will be required, FAO will use the various methodologies developed in the past years and the [best practices](#) developed in over 20 years of presence in [Jordan](#).

of activities would be only on adaptation, and this was reflected in the design of project components and activities. With regards to the construction and rehabilitation of water springs and water ponds – while these were included in the initial proposal, following consultations, it was decided to omit these activities because of risks related to the lack of information about their dimensioning, feasibility and impact on surrounding environments and communities. As a precondition for including water infrastructure activities, the MWI provided additional technical information in order to further analyse water infrastructure activities and ensure compliance with FAO and GCF safeguards. Such information was received and project activities reflect this feedback. As project preparation evolved to include this feedback, revised activities were presented at meetings, for validation.

During project implementation, consultations will be held with the involved stakeholders when the sub-activities could include impacts that affect the natural resources that sustain the agricultural production of the local population, the generation of income and the livelihoods of the people. Consultations with stakeholders during project implementation will therefore take place yearly, at the time of the preparation of Annual Work Plan and Budget (AWPB) – i.e. at the beginning of each of the eight project Fiscal Years (FY). The AWPB will be presented by the PMU and reviewed by all stakeholders, including at the national, Governorates, Municipality, and community levels. During these stakeholder engagement consultations, the ESFM – including the Grievance Redress Mechanism (GRM), but also the Gender Action Plan (GAP) - will be shared with stakeholders, and explained.

1. INTRODUCTION

The Hashemite Kingdom of Jordan is one of the most water scarce countries in the world. Water scarcity is driven primarily by the arid to semi-arid climatic regime as 92 percent of the country receives average precipitation of less than 200 mm/year² - but also by the unprecedented population increase resulting from natural growth and refugee influx.³ The water sector is considered to be extremely vulnerable to climate change and the scarcity of the resource is considered to be one of the significant barriers for the sustainable development of the Kingdom⁴. In the Dead Sea Basin, which is the location of the project area, precipitation decreased by up to 20 percent from 1901-2010 (ICARDA simulations)⁵.

Overall vulnerability of the water sector is considered very high due to high sensitivity and exposure and low adaptation capacities, **with the following main factors leading to negative impacts:** reduced precipitation; increase in irregularity of seasonal rainfall; increased intensity of droughts during which reservoirs are not refilled, groundwater is not recharged, and rain-fed agriculture suffers damages; increased severity of flood events during which water and other infrastructure experiences overflows and damages; higher irrigation water demand because of higher evaporation due to increased temperature; and expected increased abstraction of water flows from upstream neighbouring countries that cover additional needs caused by climate change.⁶

Standardized precipitation indexes indicate that **Jordan will experience more drought events especially in winter and spring.**⁷ Climate change-related reduced precipitation; increased water demand of crops in response to rising temperatures; shorter growing season; and degradation of arable land are projected to have major adverse **impacts on productivity**. The rural poor, due to their high dependence on agriculture production, are and will be the most vulnerable to projected changes in climate.

Renewable water recharge and water scarcity will be exacerbated by climate change: reduced precipitation levels, temperature increase, drought/dry days and projected evaporation and the delivery of rainfall in shorter and more intense periods are likely to be the cause of main climate hazards in the country. It is estimated that around 65 percent of the renewable water resource of the country comes from surface water sources and run-off stored in Wadis. The Dead Sea Basin (one of the major sources of groundwater and surface run-off in Jordan) covers four of the 15 sub-basins in the country. Already groundwater in the six main basins is declining at an average rate of approximately one metre/year.⁸

² The Hashemite Kingdom of Jordan. *National Water Strategy (2016-2025)*, Ministry of Water and Irrigation.

[http://www.mwi.gov.jo/sites/en-us/Hot%20Issues/Strategic%20Documents%20of%20The%20Water%20Sector/National%20Water%20Strategy%20\(2016-2025\)-25.2.2016.pdf](http://www.mwi.gov.jo/sites/en-us/Hot%20Issues/Strategic%20Documents%20of%20The%20Water%20Sector/National%20Water%20Strategy%20(2016-2025)-25.2.2016.pdf)

³ Salman, Maher *et al.* An Assessment of Policies, institutions and regulations for water harvesting, solar energy and ground water in Jordan. *In* a review and gap analysis. FAO. 2018. <http://www.fao.org/3/i8601en/i8601EN.pdf>

⁴ Government of Jordan. 2009. Jordan's Second National Communication to the UN-Framework Convention on Climate Change. <https://unfccc.int/resource/docs/natc/jornc2.pdf>

⁵ Ministry of Foreign Affairs of the Netherlands. 2018. Climate Change Profile Jordan.

https://reliefweb.int/sites/reliefweb.int/files/resources/Jordan_2.pdf

⁶ The Hashemite Kingdom of Jordan. 2014. Jordan's Third National Communication on Climate Change. The United Nations Framework Convention on Climate Change (UNFCCC). GEF and UNDP. The Deposit Number at the National Library (2014/11/5178)

⁷ *Ibid.*

⁸ Groundwater-Level Trends and Forecasts, and Salinity Trends, in the Azraq, Dead Sea, Hammad, Jordan Side Valleys, Yarmouk, and Zarqa Groundwater Basins, Jordan. <https://pubs.usgs.gov/of/2013/1061/support/ofr2013-1061.pdf>.

The key barriers that impede adaptation in the face of climate change include: the scarcity of infrastructure that can help to harvest water more efficiently; lack of storage and networks that can assist in the more efficient use of reclaimed waste water; and the lack of capacity of the Ministry of Water and Irrigation (MWI) to properly assess the technical, economic and social feasibility of investments at the landscape level.

At the household level, key barriers are the: lack of proper awareness about the impact of climate change; lack of knowledge about innovations, technologies and practices that can help households to better adapt to the change; limited acknowledgement and understanding of the key role that women can play in helping households to adapt to change; the lack of capacity of the National Center for Agricultural Research and Extension (NCARE) in disseminating research results, and of the Ministry of Agriculture (MoA) in delivering messages to the farming community; and limited engagement of the private sector in stocking and supplying adaptive inputs and technologies.

At the policy level, there are several factors that impede policy formulation and implementation. These include a mismatch between: hydrological and administrative boundaries, sectoral fragmentation, and differing rationales creating obstacles for adopting convergent targets.⁹

In summary, **three key constraints were identified which inhibit country capacity to deal with climate change.** These are related to: (i) the lack of climate proofing of water infrastructure and limited capacity of local level systems of water governance to address climate change; (ii) limited capacity of vulnerable households to cope with climate risks especially farming households; and (iii) limited capacity at the national level for planning, regulation and enforcement of policy measures, and lack of institutionalization and awareness of practices and measures for enhanced adaptation to climate change.

In order to address these constraints, in 2017 and upon agreement of the Government of the Hashemite Kingdom of Jordan, **FAO began the process of developing a proposal for the project “Building resilience to cope with climate change in Jordan through improving water use efficiency in the agriculture sector (BRCCJ)”.**

The project will be implemented in four Governorates in the Dead Sea Basin, in areas most vulnerable to climate change: Madaba, Karak, Tafilah and Ma'an. These Governorates have 152,000 households with a total population of 840,900 and cover an area of 9,839 km² which forms 72% of the Dead Sea Basin Area.

The goal of the BRCCJ project is to support the objectives of Jordan's climate change policy (2013-2020) by building the adaptive capacity of communities and institutions, addressing the needs of vulnerable groups, increase the resilience of water management systems as well as the agricultural sector to climate change. The project is aligned with the country's Green Growth Plan (2017) which stresses the importance of building rural resilience by diversifying incomes, ensuring resource availability and reducing environmental impacts. Prioritized adaptation measures for the agriculture sector identified in the National Adaptation Plan (2020) have been included in the project proposal.

The project has three interrelated components which will work synergistically and enhance the impact of project investments. The components are designed to deal with the lack of **infrastructure**, limited capacity of **households** and weak **institutional** capacity:

⁹ FAO. 2018. *An assessment of Policies, Institutions, Policies and regulations for Water Harvesting, Solar Energy and Ground Water in Jordan*.

Component 1: Climate Resilient Water Systems.
Component 2: Climate Change resilience for Enhanced Livelihoods and Food Security.
Component 3: Scaling-up Climate Adaptation.

The BRCCJ theory of change. Jordan is facing severe climate change risks and business as usual can no longer suffice in addressing the challenges the country faces to its development and growth. Climate change has exacerbated the water scarcity in the country which impacts both rural and urban households and can negatively impact their safety and health, livelihoods, and sustainable development in the country. The agriculture sector is currently reported to consume about 51% of the total water in the country with the domestic sector consuming 45%¹⁰. Current water use for all purposes far exceeds renewable supply. The annual share of water resources in Jordan has been reduced to 93 cubic metres per person¹¹. The deficit is covered by the unsustainable practice of over extraction from highland aquifers, resulting in lowering water tables and declining water quality. It is projected that Jordan's growing population combined with the influx of refugees will cause a further decline in per capita water availability.

The key barriers that impede adaptation in the face of climate change include the scarcity of infrastructure that can help to harvest water more efficiently, lack of storage and networks that can assist in the more efficient use of reclaimed waste water and the lack of capacity of the MWI to properly assess the technical, economic and social feasibility of investments at the landscape level. The theory of change of the BRCCJ project is premised on the assumption that there are three key pathways that can help the country address climate change risks: (i) Investments in infrastructure and technical capacity for planning at the hydrological basin for more strategic investments; (ii) Investing in sustaining the livelihoods of the most vulnerable households; and (iii) Long-term change requires policy reform, mainstreaming paradigm shifts in the planning and budgeting processes of national and local institutions and engagement with citizens, civil society organizations and the private sector.

BRCCJ is part of a larger, global picture, in that results of the project feed into global processes including the UN Framework Convention on Climate Change (UNFCCC) and its related agreements/processes and achieving the Sustainable Development Goals (the UN 2030 Agenda for Sustainable Development (2030 Agenda) and its 17 Sustainable Development Goals - SDGs). The proposed project is aligned with Jordan's Climate Change Adaptation (CCA) commitments, priorities and identified adaptation actions for water and agriculture, including the National Climate Change Policy (2013), the Nationally Determined Contribution (NDC), the Technology Needs Assessment (TNA), the National Water Strategy 2016-2025 and the Royal Initiative for Economic Change "Jordan 2025 - A National Vision and Strategy". The project is aligned with the adaptation measures and programs identified in the NDC and TNA for groundwater protection, surface water development, demand management for agriculture and water resources monitoring. National stakeholders have been engaged in the process of developing the concept note. The concept note is accompanied by a Letter of No-Objection from the NDA showing country ownership.

The Project has been classified as a **moderate risk (Category B) by the Food and Agriculture Organization of the United Nations (FAO)** in compliance with FAO's Environmental and Social Management Guidelines and considering the GCF's Environmental and Social Safeguards. The project's risk assessment was conducted using FAO's Environmental and Social Screening Form (Annex 3), which identifies areas of risk

¹⁰ Ministry of Irrigation. December, 2019.

¹¹ Ministry of Irrigation. December, 2019.

and, based on the risk screening responses, resulted in the moderate-risk categorization. Due diligence for addressing identified risks is carried out through the Environmental and Social Management Framework (ESMF, this document) which guides project implementing agencies and stakeholders on environmental and social assessment, mitigation of impacts, and monitoring and reporting procedures during project implementation. The ESMF will be adopted by the NDA, Executing Entity, and any sub-contractors. Any sub-contractors will include reference to this ESMF and the need to abide by the protocols and actions listed herein. Relevant project partners will be provided with required Environmental and Social Safeguards (ESS) training prior to undertaking project-related activities.

The preparation process of this ESMF contributed to project formulation by identifying, *a priori*, “do-able” – or not – activities and provided suggestions for improvements in project activity design. This ESMF ensures that environmental and social management is integrated into the development cycle of individual sub-projects. Since exact sub-projects and target areas are not determined at the onset of project but will be decided during project implementation based on demand and consultations with the concerned communities, the ESMF is the appropriate instrument under FAO’s Environmental and Social Safeguards Policy. The ESMF serves as a practical tool to guide identification and mitigation of potential negative environmental and social impacts of proposed projects and serve as a platform for consultations with stakeholders and potential project beneficiaries.

Specifically, the **objectives of this ESMF** are to:

- Assess the potential environmental and social impacts of the proposed project, whether positive or negative, and propose mitigation measures which will effectively address these impacts;
- Establish clear procedures for the environmental and social planning, review, approval, and implementation of sub-activities to be financed under the project;
- Specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to sub-activities;
- Consider different alternatives, options, and relevant mitigation measures during project preparation and implementation;
- Determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESMF;
- Address mechanisms for public consultation and disclosure of project documents as well as redress of possible grievances; and
- Establish the project funding required to implement the ESMF requirements and to provide practical resources for implementing the ESMF.

2. PROJECT DESCRIPTION

2.1 PROJECT OBJECTIVES

The objective of the project is to support the objectives of the Hashemite Kingdom of Jordan’s climate change policy (2013-2020) by building the adaptive capacity of communities and institutions in Jordan, addressing the needs of vulnerable groups, increase the resilience of water management systems as well as agricultural resources to climate change.

Climate impacts can undermine progress that has been made in poverty reduction and adversely impact food security and economic growth in vulnerable rural areas in Jordan.¹² The poor in rural areas in Jordan are expected to face the most severe consequences of climate change through disruption of livelihood options that depend on natural resource management. The expected impacts of climate change, particularly reduced agricultural productivity and water availability threatens livelihoods and keeps vulnerable people insecure. Poor families and households are the most vulnerable group to the impacts of climate change¹³ and the project has the potential to make them more resilient in facing the negative impacts of climate change. The project has the potential to achieve several fund-level impacts such as increased resilience and enhanced livelihoods for around 50,000 of the most vulnerable people, increased resilience food security for 5,000 households and increased resilience of infrastructure for 7,850 households and 400 public buildings. The project is expected to benefit approximately 212,416 people of which 47 percent will be direct women beneficiaries. The project will impact people directly in the project area and indirectly through its engagement at the national level through dissemination of information through smart applications and its work with policy and regulatory reform. In the project area, the project is expected to benefit about 10 percent of the target population in the selected Governorates in the Dead Sea Basin and 2 percent of Jordan's total population.

2.2 PROJECT COMPONENTS

In addition to Project Management, BRCCJ has three components and related activities (Table 1), and while each have their own specific outcomes, all three interrelated components will work synergistically to enhance the impact of project investments:

Component 1: Climate Resilient Water Systems.

Component 1 is designed to address the acute water scarcity in the Dead Sea Basin which has been aggravated by climate change. The **expected outcome** from the component is **enhanced water availability to address climate change risks**.

Current sources of water supply are limited and cause further water imbalance in the project locations and further downstream. In keeping with the Government's plans for a paradigm shift in how water is used and managed, the project will invest in innovative water solutions in the project area and use that as an entry point for initiating awareness and orientation about water conservation measures. It is estimated that 45 percent of the water is used for domestic purposes.¹⁴ Many households which are connected to the piped water supply for domestic use only get water once a week which further exacerbates water scarcity due to weather changes. While there is potential for investing in water structures that can help to recharge the aquifers, prevent floods and soil erosion, there is inadequate technical capacity to develop comprehensive landscape level investment plans to build the resilience of the hydrological systems. The set of interventions has been selected because of their potential for delivering high-impact within the comparative advantage of the Accredited Entity (AE) and for its potential to provide immediate and long-term protection against climate risks in the project area.

Activities for achieving **Output 1** refer to the installation of rooftop rainwater harvesting structures and water saving devices for households (HH) and public buildings. These activities aim to build climate

¹² National Adaptation Plan to Climate Change in Jordan. MoE. February 2020.

¹³ *Ibid*.

¹⁴ MWI. 2015. *Jordan Water Sector. Facts and Figures*. http://www.mwi.gov.jo/sites/ar-jo/Documents/Jordan%20Water%20Sector%20Facts%20and%20%20Figures%202015.pdf?Mobile=1&Source=%2Fsites%2Far-jo%2F_layouts%2Fmobile%2Fview%2Easpx%3FList%3D135e67a8%2D72f3%2D4957%2D9cae%2D328f5c191909%26View%3D0bea4b62%2D782d%2D4e8c%2D9c8e%2D581049637479%26CurrentPage%3D1

resilience through improved access to water and efficient water use at the household level and in selected public buildings such as schools, mosques, municipalities for wider dissemination and awareness of the technology at the local community level. It is expected that 400 public buildings and 7 850 households will be fitted with the roof top water harvesting structures. The households which benefit from the investment will be expected to contribute part of the costs based on criteria that favours women-headed households, refugee and poor households, those reliant solely on agriculture, HHs with a person with disability and more than six dependents. Women will be consulted on designing water outlets as the primary users of domestic water.

For **Output 2**, regulation, storage and distribution of hydraulic structures will be built to maximize use of reclaimed water from the Wastewater Treatment Plants in Madaba, Karak, and Tafilah. This will enhance climate resilience at the farm level by providing additional water to grow crops in accordance with Jordan's Water Substitution and Reuse Policy (2016) and will reduce the impacts of wastewater treatment effluents on the ecosystem. MWI has certified its commitment to undertake the operation and maintenance of the storage and distribution infrastructure that will be built to maximize the use of the reclaimed water.

There is need for investments in infrastructure investments for recharge of the aquifers in the Dead Sea Basin and the need for flood protection works. However, there is lack of proper technical, social and environmental assessments by the MWI. Therefore, the project will invest in the preparation of Landscape Resilience Investment Plans in the project area. Activities under **Output 3** will prioritize climate resilience investments at the landscape level in the four target governorates. Strong technical capacity will be procured through the project for development of portfolio of investments that are technically, economically and socially assessed. These plans will be used by the Government to make the investments from its own resources in the future or secure additional financing from other agencies. The key output expected will be a dossier that contains Landscape Resilience Investment Plans and strengthened capacity of the MWI in preparing similar plans for the future.

Component 2: Climate Change Resilience for Enhanced Livelihoods and Food Security.

This component has four major outputs, within three sub-components; (i) Enhanced capacity of households to deal with climate change; and (ii) strengthening of a system of E-extension for wider dissemination; and (iii) establishing a cadre of climate wise women change agents for climate adaptation. The **expected outcome** from this component is ***enhanced capacity of households to deal with climate change***.

The **first** sub-component is intended to strengthen the capacity of farming households to better adapt to climate change. Through a Farmer Field School (FFS) approach, the project will train people in water use efficiency at the on-farm level, introduce techniques and seed varieties which are much more drought tolerant and water. The project will also sponsor field days and workshops to scale up tested techniques and practices. The project will encourage women to attend mixed-gender FFS and will also organize women-only FFS. The Lead Farmers are expected to engage additional farmers in further dissemination of successful techniques and practices to other farmers. The private sector will be engaged throughout the process as they will be the ones expected to provide the improved technologies and inputs to farmers on a sustained basis. It is envisaged that by year 7, 6 000 farmers trained in climate resilient production practices through FFS (4 050) and field days (1 950).

The **second** sub-component will focus on strengthening a system of E-Extension. The project will further strengthen and consolidate the efforts of the Ministry of Agriculture (MoA) and the Ministry of

Environment in disseminating information on climate change adaptation and weather forecasts through the model of e-extension which they have put in place. The National Agricultural Research Center (NARC) is also investing in developing a system for propagating tested research through the use of smart applications. Tailored extension messages on climate adaptation measures and weather forecasts which provide actionable information will be broadcast through this mechanism. This is all the more important given the limited outreach of the traditional extension approach. It is expected that by year 7, at least 30% of the farming households in the country, or 30 000 farming households, are reached through the e-extension system.

The **third** sub-component will train a cadre of women as change agents for climate adaptation. By year 3, 400 women will be trained as Change Agents for Climate Adaptation. Building on the success of the award-winning GiZ Water Wise Women initiative in Jordan, the project will create a cadre of 400 young women as agents of change for climate adaptive practices from the rural areas in the four target Governorates. These young women will be advocates and repositories of knowledge and technical guidance and support on climate change adaptation, anchored in rural communities. The women will be trained and certified through a customized sixteen-week course delivered over the course of a year in state-of-the-art techniques for climate adaptive agriculture, agri-business planning and development and use of social media for climate change adaptation advocacy. The presence of these young women in the rural communities will bring practical knowledge and sustained support for climate adaptive agriculture to the doorstep and optimize, especially for women and youth, the benefits of project interventions. At the national level, it will highlight women's role as change agents in Climate Change in Jordan and provide the government with informed, community-based interlocutors for mainstreaming gender in climate change. Additionally, by year 7, 15 000 persons will be sensitized on climate adaptive measures, by conducting community dialogues for gender sensitive climate adaptation measures and organizing multi-stakeholder climate-wise women forums.

Component 3: Scaling-up climate adaptation to enhance mainstreaming and adoption of climate change adaptation practices.

This component will be instrumental to scale up impacts, ensure long term sustainability of identified climate change adaptation strategies and guarantee national ownership of the identified transformative path. It is designed to undertake investments at the national level in strengthening the capacity of the various agencies involved with identifying strategies and systems for improved response to climate change with respect to coordination arrangements, standard operating procedures among the various stakeholders, policy formulation and regulation, establishing early warning systems and response plans and improved information on climate change and building the capacity of key decision-makers at the highest level for informed decision-making. The main *expected outcome of this component is mainstreaming of gender sensitive resilience tools and practices to adapt to water scarcity in the national policy, educational, administrative and social frameworks*. There are three outputs that are expected under this component, which include: (i) by Year 6, specific policy and regulatory bottlenecks are identified and reforms initiated; (ii) by Year 6 at least 6 national curricula of vocational schools (masonry, plumbers and agriculture) and of specialized universities (agriculture, architecture, water engineering) are updated to include climate smart agriculture, water efficiency and precision agriculture; and (iii) By Year 7 at least 6 440 persons (4 governorates, 16 provinces, 324 municipalities) and private sector engaged in climate change adaptation practices.

Table 1. BRCCJ project components.

Components and Outputs	Activities description
Climate Resilient Water Systems	
Output 1.1.1 By year 7 at least 8250 buildings retrofitted with water harvesting structures.	<p>1.1.1.1 Provide Technical Assistance and oversight for water resilient systems.</p> <p>1.1.1.2 Selection of public buildings and awareness on water conservation schools and municipal officials.</p> <p>1.1.1.3 Construction of rooftop rainwater harvesting system in public buildings.</p> <p>1.1.1.4 Select beneficiaries, provide orientation on water conservation to households.</p> <p>1.1.1.5 Construction of rooftop rainwater harvesting system in households.</p> <p>1.1.1.6 Independent Impact assessment for Component 1.</p>
Output 1.1.2 By year 7, reuse of reclaimed water from 3 Waste Water Treatment Plants (WWTP) is optimized.	<p>1.1.2.1 Build storage and distribution infrastructure to maximize reuse of reclaimed water from existing WWTPs.</p> <p>1.1.2.2 Technical Assistance to MWI and Ministry of Health to assure compliance with environmental standards.</p> <p>1.1.2.3 Technical Assistance to promote demand and safe reuse of reclaimed water, including building local capacity of farmers and Water User Associations.</p>
Output 1.1.3 By year 4, Landscape Resilience Investment Plan for part of the Dead Sea Basin.	<p>1.1.3.1 Establish plan objectives and criteria.</p> <p>1.1.3.2 Execute technical, economic, environmental and social feasibility studies for the development of Landscape Resilience Investment Plans.</p> <p>1.1.3.3 Disseminate and validate Investment Plan.</p>
Climate Change Resilience for Enhanced Livelihoods and Food Security	
Output 2.1.1 By year 7, 6,000 Farmers trained in climate resilient production practices through FFS (4050) and field days (1950).	<p>2.1.1.1 Provide Technical Assistance and oversight for climate change adaptation.</p> <p>2.1.1.2 Design appropriate modules for Climate Smart FFS.</p> <p>2.1.1.3 Training a team of Master Trainers/Facilitators.</p> <p>2.1.1.4 Identify target groups in project area.</p> <p>2.1.1.5 Scaling-up FAO mobile geo-referenced monitoring application of adoption rates.</p> <p>2.1.1.6 Conduct Climate Smart FFS.</p> <p>2.1.1.7 Field demonstration of tested climate-adaptive innovation and practices.</p> <p>2.1.1.8 Independent Impact assessment for C2.</p>
Output 2.1.2 By year 7, 30 000 Farmers reached through e-extension.	<p>2.1.2.1 Developing climate-smart IT solutions for smart devices.</p> <p>2.1.2.2 Disseminating climate smart-solutions and weather forecast through smart devices.</p>

Output 2.1.3 By year 3, 400 Women trained as Change Agents for Climate Adaptation.	2.1.3.1 Technical assistance in climate adaptive agriculture. 2.1.3.2 Development of training manuals and certification requirements. 2.1.3.3 Scholarship for young trainers. 2.1.3.4 Competitive selection of candidates for climate wise-women. 2.1.3.5 Trainings developed for climate wise-women.
Output 2.1.4 By year 7, 15.000 Persons sensitized for climate adaptive measures	2.1.4.1 Conducting community dialogues for gender sensitive climate adaptation measures. 2.1.4.2 Organizing multi-stakeholder climate-wise women forums.
Scaling-up climate adaptation to enhance mainstreaming and adoption of climate change adaptation practices	
Output 3.1.1. By year 6, specific policy and regulatory bottlenecks are identified and reforms initiated.	3.1.1.1 Technical assistance to the Ministry of Environment, the Ministry of Agriculture and the Ministry of Water and Irrigation to initiate the process of policy reform. 3.1.1.2 Technical Assistance to support the MWI in enhancing the quality of effluent to enlarge the possible farming options and upgrade the related policy framework.
Output 3.1.2 By year 6 at least 6 national curricula of vocational schools (masonry, plumbers and agriculture) and of specialized universities (agriculture, architecture, water engineering) are updated to include climate smart agriculture, water efficiency and precision agriculture.	3.1.2.1 Technical Assistance to the Ministry of Education and main universities to update the national curricula. 3.1.2.2 Training for teachers and professors to enable the teaching and practice of the new curricula.
Output 3.1.3 By year 7 at least 6440 persons (4 governorates, 16 provinces, 324 municipalities) and private sector engaged in climate change adaptation practices.	3.1.3.1 Local engagement and dissemination process. 3.1.3.2 Technical Assistance to enhance local administration's and private sector actors' capacities to comply with the national green construction and water saving policy frameworks. 3.1.3.3 Technical assistance and training to local institutions and civil society organizations.

2.3 TARGET AREAS AND ELIGIBILITY CRITERIA

The project targets the agricultural areas in the Dead Sea Basin. The project will be implemented in selected Governorates located in part of the Dead Sea Basin (Figure 1) which includes areas most vulnerable to climate change. The four Governorates where the project will be implemented are: Madaba, Karak, Tafilah and Ma'an. Table 2 provides more detailed information.

Figure 1. BRCCJ Target Areas.

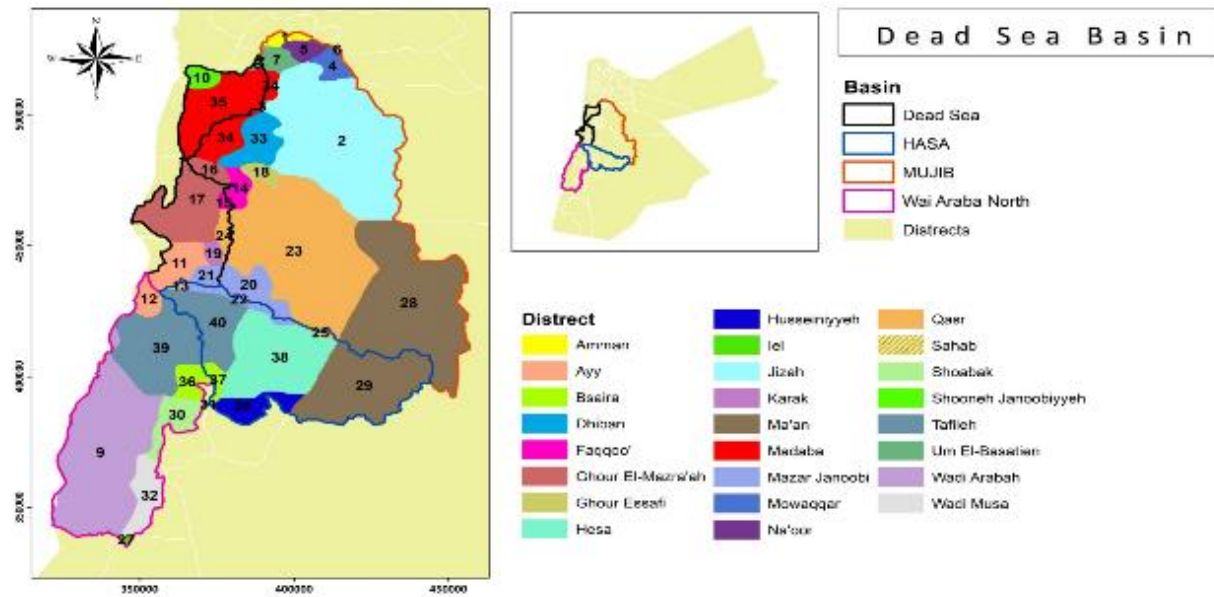


Table 2. Distrbution of the Dead Sea Basin on the district level.

Source: Department of Statistics (2019) (ref. Figure 2).

No.	Governerate	District	Total district area (km ²)	Basin name	Total basin area (km ²)	Area of the district (km ²) located in the target area	District Area % located in each basin	Total pop'n of the district	Pop'n of the district living in the target area
1	Karak	Ayy	415	D.S.R.S.W	1,549	219	14.11	9,010	4,750
2	Karak	Ayy	415	W. Araba North	2,930	99	3.37	9,010	2,143
3	Karak	Ayy	415	Hasa	2,530	12	0.49	9,010	269
4	Karak	Faqqoo'	123	Mujib	6,584	100	1.52	18,580	15,144
5	Karak	Faqqoo'	123	D.S.R.S.W	1,549	23	1.46	18,580	3,436
6	Karak	Ghour El-Mazra'ah	790	Mujib	6,584	81	1.23	23,610	2,423
7	Karak	Ghour El-Mazra'ah	790	D.S.R.S.W	1,549	532	34.37	23,610	15,905
8	Karak	Ghour Essafi	72	Mujib	6,584	72	1.10	30,181	30,181
9	Karak	Karak	49	D.S.R.S.W	1,549	49	3.14	112,060	112,060
10	Karak	Mazar Janoobi	395	Mujib	6,584	229	3.47	105,150	60,836
11	Karak	Mazar Janoobi	395	D.S.R.S.W	1,549	69	4.44	105,150	18,319
12	Karak	Mazar Janoobi	395	Hasa	2,530	98	3.86	105,150	25,995
13	Karak	Qasr	1,956	Mujib	6,584	1,867	28.36	32,510	31,032
14	Karak	Qasr	1,956	D.S.R.S.W	1,549	69	4.47	32,510	1,150
15	Karak	Qasr	1,956	Hasa	2,530	20	0.78	32,510	328
16	Ma'an	Husseiniyyeh	569	Hasa	2,530	190	7.52	19,180	6,414
17	Ma'an	Lel	622	W. Araba North	2,930	10	0.35	16,750	278
18	Ma'an	Ma'an	30,601	Mujib	6,584	1,633	24.80	97,050	5,178
19	Ma'an	Ma'an	30,601	Hasa	2,530	900	35.58	97,050	2,854
20	Ma'an	Shoabak	428	W. Araba North	2,930	207	7.06	21,350	10,307
21	Ma'an	Shoabak	428	Hasa	2,530	0	0.00	21,350	5
22	Ma'an	Wadi Musa	456	W. Araba North	2,930	232	7.92	12,961	6,589
23	Madaba	Dhiban	256	Mujib	6,584	256	3.89	40,270	40,270
24	Madaba	Madaba	937	Mujib	6,584	232	3.52	168,930	41,846

25	Madaba	Madaba	937	D.S.R.S.W	1,549	496	32.00	168,930	89,377
26	Tafilah	Bsaira	209	W. Araba North	2,930	126	4.32	27,920	16,919
27	Tafilah	Bsaira	209	Hasa	2,530	58	2.31	27,920	7,817
28	Tafilah	Hesa	838	Hasa	2,530	838	33.15	11,330	11,330
29	Tafilah	Tafileh	1,123	W. Araba North	2,930	709	24.21	67,250	42,491
30	Tafilah	Tafileh	1,123	Hasa	2,530	413	16.31	67,250	24,720

The definition of the project location was based on consultations with stakeholders during the project identification and preparation cycle. National consultations with the participation of stakeholders (including the National Designated Authority (NDA); relevant ministries, including the Ministries of Agriculture, and Water and Irrigation; and the National Agriculture Research Center (NARC)) provided the analysis of current priorities in the agricultural sector and livelihoods within climate change settings.

The selection of project target areas was guided by climate change challenges and related vulnerabilities, the presence of a significant number of poverty pockets, potential for site-specific Climate Change Adaptation (CCA) interventions, and complementarity with other projects (e.g. Adaptation Fund in the Jordan River Valley). More specifically, based on objectively verified data, target areas were selected according to the following criteria:

- a) Included in the Dead Sea basin.
- b) Climate change exposure.
- c) Presence of large¹⁵ rural communities.
- d) Vulnerability of communities and livelihoods¹⁶.
- e) Persistent water scarcity.

The project is expected to benefit approximately 212,416 people of which 47 percent will be direct women beneficiaries. The project will impact people directly in the project area and indirectly through its engagement at the national level through dissemination of information through smart applications and its work with policy and regulatory reform. In the project area, the project is expected to benefit about 10 percent of the target population in four selected Governorates in the Dead Sea Basin and 2.1 percent of Jordan's total population.

2.4 PROJECT GOVERNANCE AND MANAGEMENT

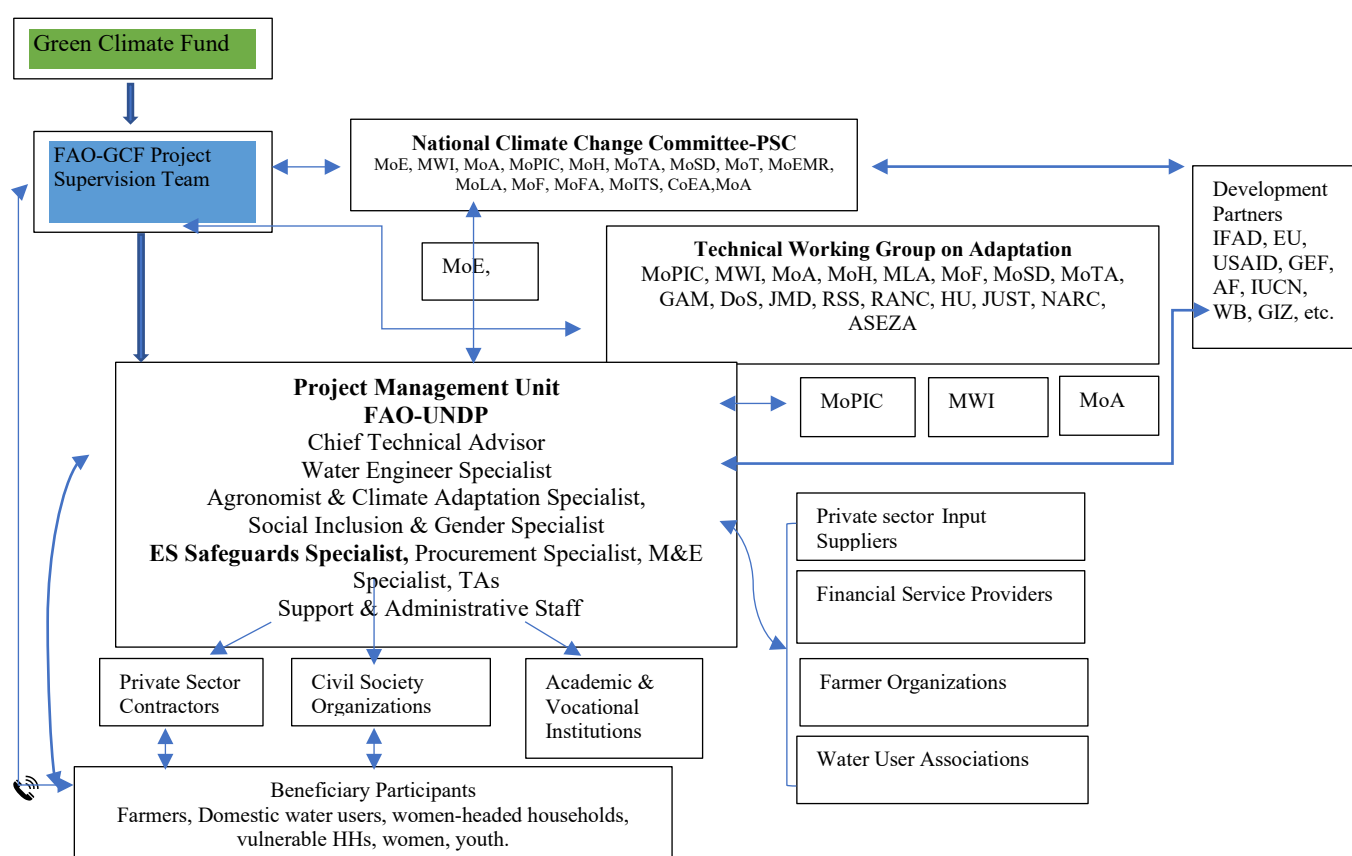
At the level of strategic guidance and oversight, the National Climate Change Committee (NCCC) will act as the project Steering Committee. The NCCC consists of key Ministries including, among others, the Ministry of Environment (MoE), the Ministry of Water and Irrigation (MWI), the Ministry of Agriculture (MOA), the Ministry of Planning and International Cooperation (MoPIC), Ministry of Health (MoH), and the Ministry of Education (MoE). The Ministries are represented in the NCCC at the level of the Secretary General and meet on a quarterly basis. The NCCC ensures multi-sector coordination of all activities in Hashemite Kingdom related to climate change. The Commission is already operational and has a mandate to coordinate climate change activities across sectors and projects. It is expected that the NCCC will play a key role in the initiation of the policy reform agenda by ensuring coordination among institutional

¹⁵ Compared to the average rural population of the country (10%)

¹⁶ Based on the criteria identified by the Third National Communication on Climate Change to the UNFCCC (2015) and the National Adaptation Plan (2020).

stakeholders and facilitating policy dialogue. A Technical Working Group (TWG) on adaptation has also been constituted by The Government of Jordan with 17 institutional members¹⁷. In addition to some of those listed above, the TWG includes the Department of Statistics, the Jordan Metrological Department (JMD), the Royal Scientific Society, the Royal Academy for Nature Conservation, the Hashemite University (HU), the Jordan University of Science and Technology (JUST) and the National Agricultural Research Center (NARC). The TWG will support the coordination among institutional stakeholders and will support mainstreaming of practices and technologies across central and local institutions. Additionally, the TWG will be used for effective technical coordination and support as some of the members of the TWG such as Jordan Metrological Department (JMD), NARC, Jordan University of Science and Technology (JUST) are also expected to play an important role in implementation. The organizational structure of the project is illustrated in Figure 2, below.

Figure 2. Project Organizational Structure.



¹⁷ MoPIC, MWI, MoA, MoH, MLA, MoF, MoSD, MoTA, GAM, DoS, JMD, RSS, RANC, HU, JUST, NARC, ASEZA.

3. ENVIRONMENTAL AND SOCIAL BASELINE¹⁸

3.1 GEOGRAPHICAL CONTEXT

Jordan is a relatively small (89,342 km²)¹⁹, semi-arid country in the Middle East, bordered by Syria to the north, Iraq to the east, Saudi Arabia to the east and south, and Israel and the West Bank to the west. The Dead Sea located along its western borders, and the country has a 26km coastline along the Red Sea at the south-west. The climate of Jordan is mostly arid desert with a relatively short rainy season between November and April. The topography of the country is highly contrasting; from more than 400 meters below sea level at the Dead Sea to 1,854 meter above sea level (asl) at the southernmost boundary in Um Addami Mountain.

There are four main bio-geographical regions in Jordan²⁰:

Mediterranean: Limited to the highlands, the Mediterranean region extends from Irbid in the north to Ras Al-Naqab in the south, with some isolated representation in the mountains of Wadi Rum. The altitude ranges from 700 to 1850 m above sea level. Annual rainfall ranges from 300 to 600 mm. Minimum annual temperature ranges from 5 to 10° C and mean annual maximums range from 20 to 30° C. Soil is dominated by the red Mediterranean soil (terra rosa) and the yellow Mediterranean soil (rendzina). This region comprises the most fertile part of the Kingdom and hosts 90 percent of the total population.

Irano-Turanian: This region is a narrow strip of variable width that surrounds the entire Mediterranean ecozone except in the north. A characteristic of this region is that it is treeless; vegetation is primarily constituted of small shrubs and bushes such as *Artemisia herba-alba* and *Anabasis syriaca*. Altitudes range from 500 to 700 m, and annual precipitation ranges from 150 to 300° mm. Mean annual minimum temperatures range from 5 to 2° C, and the mean annual maximum ranges from 15 to 25° C. Soils are mostly calcareous or transported by wind. The vegetation is dominated by chamaephytes.

Saharo-Arabian: This is the eastern desert or Badia and is the largest part of Jordan encompassing, making up approximately 80 percent of the total area. The Saharo-Arabian region is flat except for a few hills or small mountains, the result of volcanic eruptions. Altitudes range between 500 and 700 m. Average annual precipitation from 50 to 200 mm; mean annual minimum temperatures range from 15 to 2° C and the mean annual maximum ranges from 25 to 40° C. Soil is mostly poor: either clay, hamada, saline, sandy or calcareous. Vegetation is dominated by small shrubs and small annuals in the wadi beds.

Sudanian: Starting from the northern part of the Dead Sea, the Sudanian region ends at the tip of the Gulf of Aqaba in the south along the Dead Sea depression and Wadi Araba. The most important characteristic of this region is the altitude, considered to be the lowest point on earth (410 m below sea level near the Dead Sea). Annual rainfall ranges from 50 to 100 mm; mean annual minimum temperatures range from 10 to 29° C, and mean annual maximum temperatures range from 20 to 35° C. Soils are mostly alluvial, saline, sandy and granitic. The only inland sand dunes are found in this region. The vegetation is characterized by tropical trees such as *Acacia* spp. and *Ziziphus spina-christi*, in addition to some shrubs and annual herbs.

¹⁸ A significant amount of information for this chapter has been extracted from two Working Papers that form art of the Full Funding Proposal: (i) Climate Change and Environment in Jordan; and (ii) Water Sector Background Paper. Wherever possible, information at project district level is provided.

¹⁹ CIA The World Factbook. <https://www.cia.gov/library/publications/the-world-factbook/geos/jo.html>

²⁰ Hashemite Kingdom of Jordan. 2015. National Biodiversity and Action Plan 2015-2020.

The climate of Dead Sea Basin varies between the Mediterranean in the western and northern basin area, and semi-arid in the eastern and southern basin area. The Mediterranean climate is characterized by dry hot summers and rainy-mild winters; the semi-arid climate by dry, hot and dusty summers and cold winters with less than 50 mm per year. Low relative humidity is a result of high evaporation rates during the summer months. In the spring and autumn months, the Dead Sea Basin is exposed to dust storms that occur mainly in the southern and eastern areas of the basin. Rain starts in October and lasts until May, but most precipitation falls in January.

The main sub-basin is the Mujib basin that encompasses two main catchments - the Wadi Mujib and the Wadi Wala - and comprises an area of 6,727 km² of mainly plateau land to the east of the Dead Sea. The altitude level of the plateau ranges between approximately 700 and 1000m asl and drops to approx. 400m below sea level when entering the Dead Sea. The climate varies between Mediterranean in the western and northern areas to arid to semi-arid in the rest of the region²¹ and follows the same patterns as the national climate. Average rainfall can vary significantly and ranges from 300 mm in the eastern part of the basin to below 50 mm in the western part²².

Due to the variable topographic features of Jordan, the distribution of rainfall varies considerably with location. Rainfall amounts vary from 192 mm in the Dead Sea Side Wadis basin to less than 131 mm in the Mujib basin. The long-term average of rainfall which falls on the Dead Sea Basin is approximately 1911MCM/year. Approximately 92.5 percent of the rainfall evaporates back to the atmosphere, the rest flows in rivers and wadis as flood flows and recharges groundwater. Groundwater recharge amounts to approximately 5.5 percent of the total rainfall volume. Surface water amounts to approximately 2 percent of total rainfall volume²³.

3.1.1 Basic characteristics of target areas.

The Governorate of Madaba is located in the Central Region and southwest of Amman. Its surface is 940 km² (1.1 percent of the total country area), with 204,300 inhabitants (2 percent of the total population), making it the 3rd smallest and the 5th least populated Governorate with a density of 217 persons/km².²⁴ The Governorate comprises two districts, Qasabat Madaba including 44 towns/villages and Deeban with 26 towns/villages. The Northern and Eastern part of the Governorate of Madaba belong to the highlands and have therefore a Mediterranean climate. The Western part connects to the Dead Sea with altitude levels falling to -419 m and a sub-tropical climate, mild winters and very hot summers. The registered average rainfall in Madaba governorate, as recorded by the meteorological stations in the years 1998 – 2008, ranged between 214 mm and 277.9 mm.

The Governorate of Karak is part of the Southern regions and has 341,900 inhabitants (representing 3.3 percent of the total population) living on a surface of 3,495 km² (or, 3.9 percent of total area), with a density of 97,8 persons/ km². Karak is therefore the 6th largest and 6th most populated governorate²⁵, and comprises seven districts. There is a significant increase in minimum and maximum temperature and decrease in precipitation present - twelve years out of the last 20 years have experienced below than average precipitation.

²¹ Mahmoud Abu-Allaban, Ali El-Naqa, Mohammed Jaber & Nezar Hammouri. *Water scarcity impact of climate change in semi-arid regions: a case study in Mujib basin, Jordan*. Arabian Journal of Geoscience. Volume 8:2. 2015.

²² Al-Kharabsheh A, Alatoum M. Effect of Agricultural Activities on Water Quality Deterioration of Mujib Basin, Jordan.

²³ Ministry of Water and Irrigation (MWI), Annual Report, Amman, Jordan, 2018, www.mwi.gov.jo

²⁴ Department of Statistics, 2018. Jordan in Figures.

²⁵ Department of Statistics, 2018. Jordan in Figures.

The Governorate of Tafilah is part of the Southern region and has 104,000 inhabitants (1 percent of the total population) living on a surface of 6,905 km² (7.8 percent of total area), and with a density of 47,1 persons/km². Tafilah is therefore the 6th smallest and 4th least populated governorate²⁶ and comprises three districts that are all part of the target regions of the project. The average elevation in the region is 740m, with a maximum elevation of 1 640m, a minimum elevation of -372 m and an average slope of 10.73 degrees. The weather station in Tafilah showed in 2017 the following data: mean annual humidity: 56.4 percent; mean annual rainfall: 65.5 mm; absolute maximum temperature: 35°C, absolute minimum temperature: -3,6°C and mean temperature: 16.4°C²⁷. For 2018, the weather station Eiss recorded an annual rainfall of 213.9 mm²⁸.

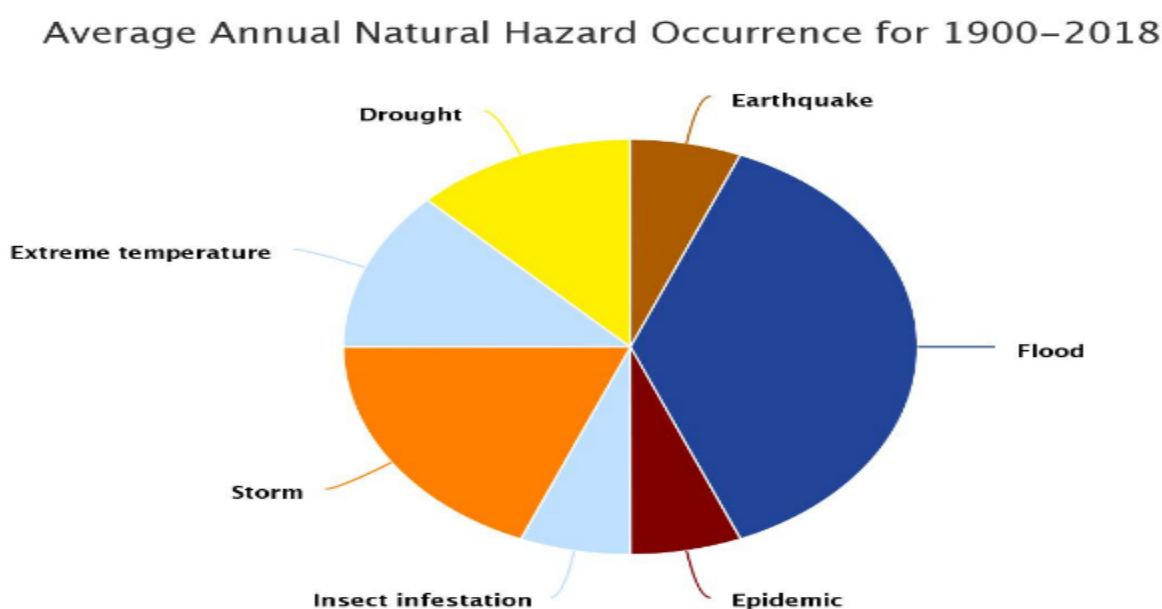
The Governorate of Ma'an is part of the Southern regions and has 171,100 inhabitants (1.7 percent of total population) living on a surface of 32,832 km² (37 percent of total area), with a density of 5,2 persons/km². Despite being the largest governorate, Ma'an is also the second least populated one, due to a low population density of 5.2 persons/km².²⁹ The governorate comprises four districts, three of which, and one sub-district, are part of the target areas. Ma'an has an average elevation of 883 m, ranging from a maximum of 1,733 m to a minimum of 284 m a.s.l. Average slope is 2.15 degrees.

3.2 ENVIRONMENTAL CONTEXT

The main issues related to the environment in Jordan include the limited natural freshwater resources, deforestation, overgrazing, soil erosion, desertification and pollution. The largest natural hazard threats are drought and flooding (Figure 3). Climate change is expected to exacerbate natural environmental pressures.

Figure 3. Average annual natural hazard occurrence 1900-2018.

Source: World Bank Climate Knowledge Portal.



²⁶ *Ibid.*

²⁷ *Ibid.*

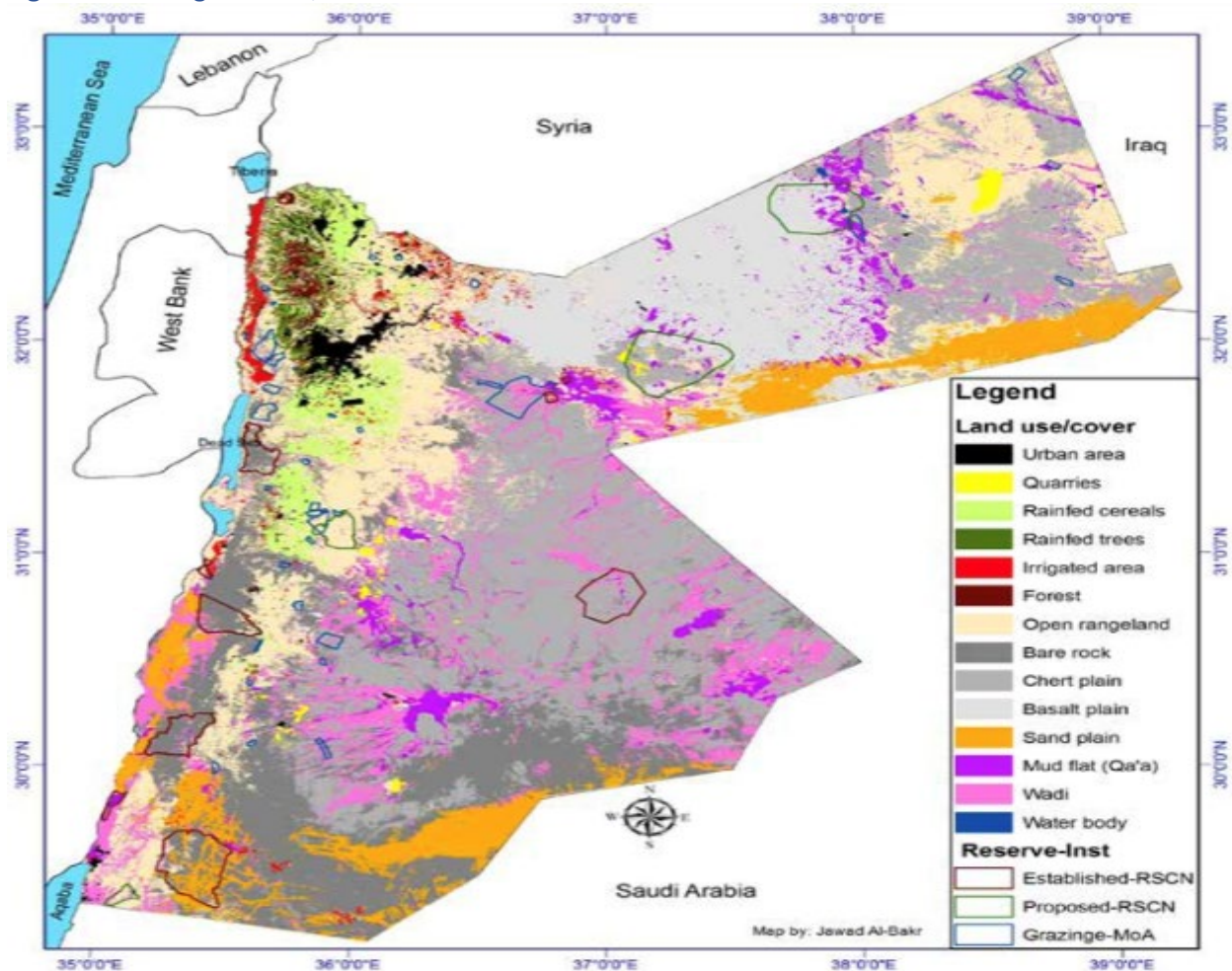
²⁸ Department of Statistics, 2018. Statistical Yearbook.

²⁹ Department of Statistics, 2018. Jordan in Figures.

3.2.1 Desertification³⁰

Population growth, climate change, unsustainable land use, land degradation and growing urban areas increase the pressure on productive land and water resources. At the same time, competition for productive land increases due to growing demand for food and fodder. The drylands continue to be the most vulnerable and threatened by desertification, land degradation and drought. This is a serious threat for those communities that heavily rely on land as their main asset, especially the rural poor.

Figure 4. Existing land use/cover of Jordan.



Source: Aligned National Action Plan to Combat Desertification in Jordan 2015 – 2020.

Smallholder agricultural activities such as unsustainable crop production, unsustainable rangeland management, and over exploitation of vegetation in Jordan are considered as drivers of land degradation. Another example is the over-pumping of groundwater practiced in the eastern and southern plains farming contributes, by affecting vegetation, soil and water resources that are used by small-scale farming.

³⁰ The Hashemite Kingdom of Jordan. The Aligned Aational Action Plan to Combat Desertification in Jordan 2015 – 2020.

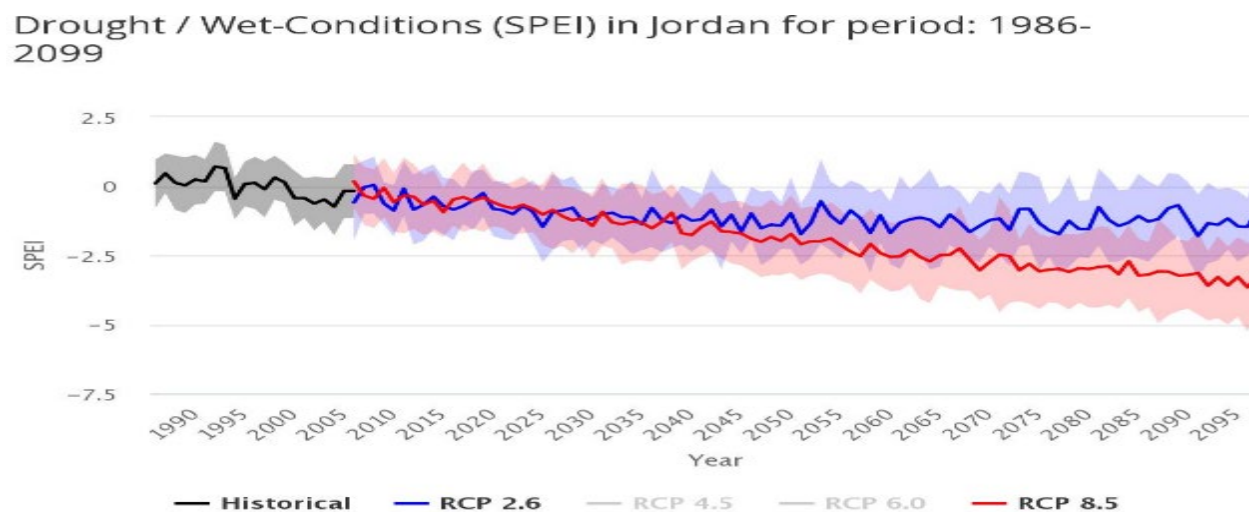
There are four different types of land degradation occurring in Jordan, in different ecosystems/regions that characterize the country. The Highlands and Jordan Valley escarpment are prone to water erosion, as a consequence of deforestation, overgrazing, and unsustainable agricultural practices. In the Eastern plains, steppe areas and badia, overgrazing and deforestation exacerbate wind erosion. Agricultural practices, overgrazing and deforestation cause declines in soil fertility, and soil compaction in the Highlands and Jordan Valley. Lastly, rangeland and vegetation degradation in the forest and badia ecosystems are primarily caused by overgrazing and deforestation.

Soil properties and processes such as organic matter decomposition, leaching, and soil water regimes will be influenced by temperature increase, and these constitute additional pressures on natural ecosystems and the provision of ecosystem goods and services. Soil erosion and degradation are likely to aggravate the detrimental effects of a rise in air temperature on crop yields. Heavy rainfall through increased wind speed are other climate change effects that can also increase erosion in some regions.

There has been an increase in the incidence of drought events in Jordan. Studies indicate that frequent non-uniform drought periods will occur, in an irregular, repetitive manner. Drought severity, magnitudes and lifespan will increase with time shifting from normal to extreme levels (Figure 5). Generated maps indicate the presence of two drought types: local, acting on one or more geographical climatic parts; and national, of less common but more severe, that extends over the whole country. These droughts will negatively impact the Jordanian agriculture system^{31,32,33,34}.

Figure 5. Drought/wet-conditions (SPEI) 1986-2099.

Source: World Bank Climate Knowledge Portal.



³¹ Al-Qinna M., Hammouri N., Obeidat M., Ahmad F., 2011. Drought Analysis in Jordan under Current and Future Climates. *Journal of Climatic Change*, 106(3):421-440.

³² Muna Saba (2018). Drought monitoring and analysis using satellite vegetation indices. Eighth Scientific Agricultural Conference, 15/10/2018, Mutah University, Karak, Jordan.

³³ Al-Naber, G., J. Al-Bakri and M. Saba (2009) "Monitoring Drought and Desertification in Jordan with Remote Sensing" Presented in Applications of Remote sensing & GIS Symposium, Amman, Jordan, 20 April 2009.

³⁴ Muna Saba, Eddy De Pauw, and Wolfgang Goebel. (2013). Downscaled climate change maps 2010-2040 for Jordan. the Sixth Conference on Scientific Research in Jordan, organized by Jordan Society for Scientific Research and Al –Zaytoonah University of Jordan on 23/11/2013.

3.2.2 Water.

An in-depth analysis of Jordan's water sector can be found in the "*Water sector working paper*" of the Full Project Funding Proposal and Feasibility Study, from which parts have been extracted for this section. The working paper provides more detailed technical information on status and projections.

One of the ten most water stressed countries in the world, the inadequate supply of water is the dominant economic and environmental challenge to life in Jordan. Water scarcity has been and remains a major challenge in the country due to limited available water resources, waste disposal issues, inadequate infrastructure and inadequate enforcement of regulations. An increasing population growth and refugee influx are expected to aggravate this condition in the near future³⁵. Currently, total water use exceeds the renewable supply, with the balance being met mostly by groundwater over-abstraction and reclaimed wastewater, and to a lesser extent by small-scale desalination. The estimated renewable water resource base in Jordan is around 780 million cubic meters (MCM), of which 275 MCM is groundwater; the remainder comes from surface water sources such as the Yarmouk River and runoff stored in Wadis. Approximately 116 MCM/year of water is also available from treated wastewater, which is stored inside Wadi dams and then used for irrigation in the Jordan Valley³⁶.

Water scarcity is driven primarily by the arid to semi-arid climatic regime, with 92 percent of the country receiving an average precipitation of less than 200 mm/year³⁷. In 2014/2015, the average annual rainfall volume was 8 884 MCM (Figure 6).

In 2015, the Ministry of Water and Irrigation (MWI) estimated a water demand of 1 222 MCM with a deficit of 214 MCM. Jordan's water deficit is projected to become even more severe in the near future. Assuming that renewable supplies remain constant, increases in demand are projected to lead to a fall in per capita water availability to 90 m³ by 2025. Furthermore, climate models for the region predict a decrease in winter rainfall and an increase in mean annual temperature which will reduce the renewable water supply and further exacerbate water scarcity. The high rates of groundwater over-abstraction cannot be sustained either, as pumping costs and salinity levels will continue to increase³⁸.

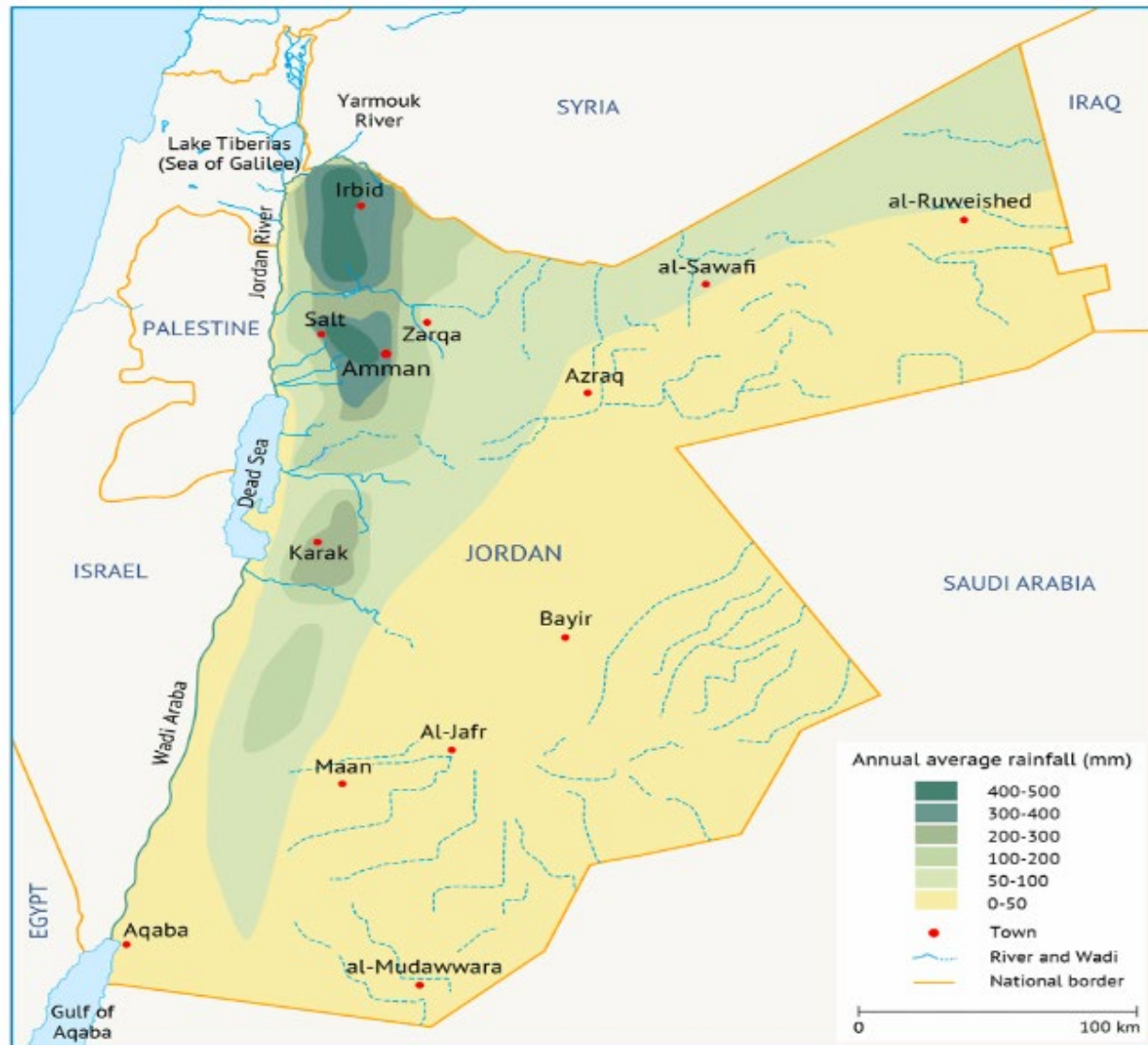
³⁵ FAO. 2018. An assessment of policies, institutions and regulations for water harvesting, solar energy, and groundwater in Jordan. A review and gap analysis. FAO. Rome.

³⁶ FAO. 2013. National Investment Profile: The Hashemite Kingdom of Jordan. FAO. Rome.

³⁷ Ministry of Water and Irrigation. National Water Strategy (2016-2025).

³⁸ FAO. 2013. National Investment Profile: The Hashemite Kingdom of Jordan. FAO. Rome.

Figure 6. Annual average rainfall in Jordan.



Source: Fanack after MWI, 2015, in FAO. 2018. An assessment of policies, institutions and regulations for water harvesting, solar energy, and groundwater in Jordan. A review and gap analysis. FAO. Rome.

Surface Water. In Jordan, surface water resources are unevenly distributed among 15 basins. Table 3 shows the surface water in the project area. Average annual rainfall ranges from 131 mm in the Mujib Basin to 192 mm in the Dead Sea side Wadis. The runoff coefficient is low in the project area and ranges between 0.7 percent in north Wadi Arba Basin to about 4.0 percent in the Mujib Basin. The long-term annual volume of water in the Dead Sea Basin is about 1911 MCM. The Mujib Basin alone contributes to about 46 percent of the total volume of rainfall in the Dead Sea Basin.

The total streamflow in the project area is about 147 MCM of which 67 percent is baseflow and the remaining is flood water. Karak Governorate has the highest total surface runoff of about 73.44 MCM,

while it is lowest in the Tafilah Governorate (7.31 MCM). Total surface runoff in Madaba Governorate is approximately 65 MCM.

Table 3. Surface water in the project area.

Basin	Catchment area (km ²)	Average Annual Rainfall (mm)	Estimated runoff coefficient (%)	Long-term (1937-1998) Rainfall average (MCM/yr)
Mujib	6727	131	4.0	884
Hasa	2603	128	2.8	334
Dead Sea side Wadis	1508	192	2.5	290
North Wadi Araba	2953	136	0.7	403
Total				1911

Groundwater. Jordan's groundwater is distributed across 12 major basins, ten of which are renewable groundwater basins and two, in the southeast, are fossil groundwater aquifers. Total internal renewable groundwater resources are an estimated 275 MCM/year³⁹. Currently, most groundwater is exploited at maximum capacity, in some cases beyond safe yield. Of the 12 groundwater basins, six are overexploited, four are balanced, and two are underexploited. Overexploitation of groundwater resources has resulted in degraded water quality and reduced exploitable quantities. The abandonment of many municipal and irrigation water-well fields were a consequence of this. In 2010, water withdrawal was 970 MCM with 59 percent destined to agriculture, 34 percent to domestic use, 6 percent to industrial use and 1 percent to tourism. During periods of water shortage strict measures are taken such as rationing water allocations, and reducing or banning the cultivation of irrigated summer vegetables⁴⁰.

Wastewater. Due to the overall water shortage in Jordan, the use of renewable unconventional water sources increasingly come into focus. One of the sources is reclaimed wastewater. The amount of reclaimed wastewater in 2017 was around 165 MCM, from which 90 percent is reused directly (direct agreements with farmers) or indirectly (mixing with rainwater and surface water in dams). The collected wastewater is clarified in 34 public WWTPs⁴¹. Wastewater in Jordan is highly saline. The high salinity of wastewater is caused by the high salinity of domestic drinking water. This is exacerbated by the use of Waste Stabilization Ponds (WSP) that have high evaporation rates, especially during the summer season. Waste water reaching Waste Water Treatment Plants (WWTP) have insignificant levels of heavy metals and toxic organic compounds due to the low level of industrial discharges to the WWTPs⁴².

Water and climate change. Climate change has exacerbated water scarcity in Jordan due to the decreasing trend of precipitation (1.2 mm per year) and increases in temperatures (by 0.03°C/year) - which increases crop water needs and affects plant growth and maturity. Increases in temperature can also intensify the water cycle causing more extreme floods and droughts globally. In Jordan, annual maximum and minimum temperature have increased by 0.3-1.8°C and 0.4-2.8°C, respectively, since the 1960s. Annual precipitation rates show decreases at most meteorological stations. This has resulted in

³⁹ FAO. 2018. An assessment of policies, institutions and regulations for water harvesting, solar energy, and groundwater in Jordan. A review and gap analysis. FAO. Rome.

⁴⁰ *Ibid.*

⁴¹ Ministry of Water and Irrigation. 2017. Jordan Water Sector Facts and Figures.

⁴² FAO. 2018. An assessment of policies, institutions and regulations for water harvesting, solar energy, and groundwater in Jordan. A review and gap analysis. FAO. Rome.

reduced recharge and less replenishment of surface and groundwater reserves, as well as an increase in the incidence of flash floods as was witnessed in 2018. According MWI (2016), by 2100, the mean and maximum temperatures over Jordan will be 2-4 degrees Celsius higher, precipitation 15-20 percent lower, and potential evapotranspiration about 150 mm higher.

Climate change poses new challenges to the management of water resources. The rising variability of rainfall will have a serious impact on multi-dimensional water use and management, including greater increase and uncertainty in extreme events such as droughts and floods. The variability of water resources, especially the variability of rainfall, is a major obstacle to economic growth and rainfed agricultural production in Jordan, including in the study area. Changes in precipitation features, including the amount, intensity, frequency and the type of precipitation will also increase the variability of river flow and groundwater recharge - and thus affect all sources of water. Analysis of available research data indicates that climate change, manifested through significant temperature increases and uncertain changes in precipitation, will impact the Mujib Basin hydrology and agriculture in numerous ways.

Irrigation water. The agricultural sector requires large volumes of water, accounting for 51 percent of total national water needs (2015 MWI figures show that 45 percent is for domestic use, and 4 percent for industry). Farmers irrigate less than 10 percent of the total agricultural land and only 5 percent of the land receives enough rainfall to support cultivation. Due to water scarcity in Jordan, the government has attempted to ration the use of water and allocate scarce water resources to competing uses, thus, reducing the water allocated to irrigation. While the area of land cultivated in Jordan has shown some variation over recent years, the percentage of cultivated land that is irrigated has seen a decreasing trend; according to FAOSTAT statistics, the figure in 2017 stood at 86 500 hectares, from 103.4 in 2013. Twenty-eight percent of water for irrigation comes from surface water, 46 percent from groundwater, and the remaining 26 percent from treated wastewater.

Madaba. The Governorate has a per capita water consumption of 109.7 l per person/day which is lower than the national average of 125.5l. The Non-Revenue Water factor (NRW) describing water loss is 35 percent lower than the national average of 52 percent. Agriculture consumes 6.6 MCM of the total 16.47 MCM of water per year. Water consumption share for this sector is therefore 40 percent and significantly lower than in the rest of the kingdom. Most of residential houses are connected to the Madaba wastewater treatment plant with an average daily treatment capacity of 5000 m³/day and an efficiency of 98 percent. The Mihayouna company operates as a government-owned utility providing retail distribution and water and wastewater treatment to the region. Next to Madaba the company covers also Greater Amman area as well as Balqa, Zarqa and services a of total 550 000 customers⁴³.

Karak. The Governorate's per capita water consumption of 179.4 l per person/day is higher than the national average, which is in part attributable to the high NRW losses of 69.2 percent. Furthermore, despite the limited amount of land utilized for irrigated cultivations, agriculture consumes 65 percent of the total water consumption, amounting to 93.2 MCM per year. Forty-two percent of this water is used for cultivation in the Jordan Valley, and the remainder in the highlands⁴⁴. Aqaba water company operates as a government-owned utility providing retail distribution and water and wastewater treatment to the region. Next to Karak the company covers also Aqaba, Karak, Tafilah and Ma'an and services a total of 130 000 customers.

⁴³ Ministry of Water and Irrigation, 2016. Water Reallocation Policy

⁴⁴ *Ibid.*

Tafilah. The Governorate's per capita water consumption of 128 l per person/day is higher than the national average, which is in part attributable to high NRW losses of 57.2 percent. Despite the limited amount of land utilized for irrigated cultivation, agriculture consumes around half of the total 14 MCM water consumption per year⁴⁵; the share is, however, significantly lower than the national average.

Ma'an. The Governorate's per capita water consumption of 236.2 l per person/day, which is almost double the national average and the second highest among all governorates. The NRW losses are, at 73.2 percent, the highest of all Governorates. Agricultural water use is exclusively used in the highlands of the Governorate and responsible for an impressive 82 percent of the total 133.9 MCM⁴⁶.

3.2.3 Biodiversity.⁴⁷

Jordan has a surprisingly high plant diversity, considering its size and aridity. The total number of recorded vascular plant species is over 2,622 species belonging to 113 families and around 810 genera, and about 2.5 percent of the total species recorded are endemic. According to the IUCN Red List (2014), Jordan is home to 103 globally threatened species of fauna. The proportion of threatened species to the total number of species is very high, especially for mammals, where 13 out of 83 mammals are considered globally threatened. Of 106 species of reptiles, six are threatened. Given its geographical location, Jordan is also one of the most important flyways and resting points for migratory birds in the spring and autumn; the high number of birds (436) is expected because of Jordan's location along the migratory route between Eurasia and Africa.

The marine environment is home to over 510 marine fish species, 5 percent of which are endemic. A total of 15 species of fresh water fish belonging to six families and represented in 12 genera have been recorded in Jordan. There are three endemic freshwater fishes in Jordan, one of which (*Aphanius sirhani*) is only found in Azraq; *Garra ghorensis* and *Aphanius richardsoni* can be found in the Dead Sea basin.

With regards to genetic diversity, many plant species are adapted to desert areas. Jordan harbors a vast diversity of landraces, old cultivars, wild species and wild relatives of wheat and barley. Examples include cultivated durum (*Triticum durum*), cultivated bread wheat (*Triticum aestivum*), old wheat (*T. monoccocum*), wild einkorn (*T. beoticum*), *T. turgidum* wild relatives, and wild barley (*Hordeum spontaneum*). Wild relatives of fruit trees are found in the highlands, including, for example, *Ceratonia siliqua*, *Caratagus aronia*, *Prunus mahaleb*, *Pistacia spp.*, and *Olea europaea*. These plants have adapted to harsh environmental conditions such as temperature extremes, drought and poor soil fertility. They are potential sources of genetic material for dwarfism, drought and calcareous soil tolerance traits.

3.2.4 Climate change.

An in-depth analysis of Jordan's climate can be found in the Working Paper on "*Climate Change and Environment in Jordan*" of the Full Project Funding Proposal and Feasibility Study, from which parts have been extracted for this section. The working paper provides more detailed technical information on status and projections.

⁴⁵ *Ibid.*

⁴⁶ *Ibid.*

⁴⁷ Hashemite Kingdom of Jordan. 2015. National Biodiversity and Action Plan 2015-2020.

Greenhouse gas emissions. In 2006, Jordan contributed about 28717gigagrams (Gg) or 28.72 million tonnes (Mt) of CO₂ equivalent (CO₂ eq.) of Greenhouse Gas (GHGs) emissions to the atmosphere. A sectoral breakdown of Jordan's total emissions of GHGs in 2006 is as follows:

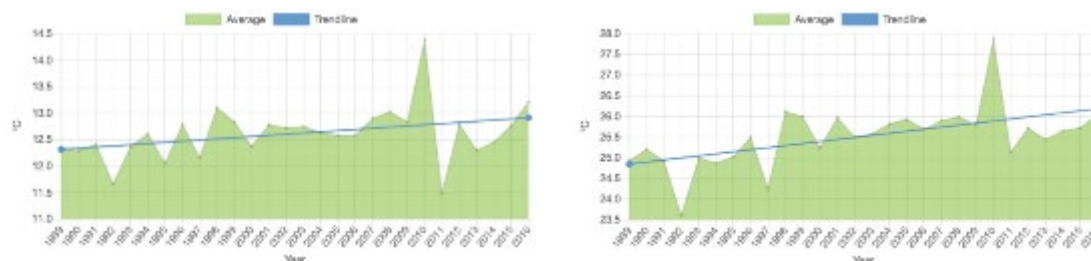
- Energy (20938Gg CO₂eq), 72.9 percent.
- Industrial processes (about 2550Gg CO₂ eq.), 8.9 percent.
- Agriculture (1318Gg CO₂ eq.), 4.6 percent.
- Waste (3045Gg CO₂ eq.), 10.6 percent.
- LULU CF (866Gg CO₂ eq.), 3.0 percent.

GHG emissions from agriculture activities were composed of methane and nitrous oxide. Emissions of indirect GHGs of CO and NO_x were negligible. GHG emissions from the waste sector were 3045Gg CO₂ eq. at 10.6 percent of Jordan's total GHG emissions. Most of the emissions originated from disposal of domestic solid waste which accounted for 98.6 percent (3003Gg CO₂ eq) of the total waste emissions, while wastewater handling accounted for 1.4 percent (42Gg CO₂ eq) of the total waste emissions.

Temperatures. The average annual air temperature in Jordan is 18.6°C, ranging from 13°C in the Southern Badia to 28°C in Aqaba. The Dead Sea Basin has an average temperature fluctuating between 16°C and 21°C, with average minimum temperatures ranging from <7°C-18°C. The maximum temperature is distributed almost uniformly in the whole country and corresponds to an average of 25.3°C⁴⁸ (Figure 7, below).

Figure 7. Trend of minimum (left graph) and maximum temperatures in Jordan from 1989 -2010.

Source: FAO, 2020. Earthmap. accessed at <https://beta.earthmap.org/>



Jordan's rainy season lasts from October to May, with 80 percent of rainfall occurring from December to March and a maximum rainfall in January. There is a significant variation of precipitations between the different climate regions; amounts range from 28 millimeters in the southern Badia region to a maximum of 570 millimeters in the upper northern highlands of Ras Muneef⁴⁹.

According to the simulations reported by the [CC Knowledge Portal](#), climate change has already impacted Jordan: annual maximum and minimum temperatures have increased by 0.3-1.8°C and 0.4-2.8°C, respectively, since the 1960s. According to the Representative Concentration Pathway (RCP) 2.6, temperatures in Jordan are projected to increase throughout the year with a median temperature of +1.42 [+0.84°C to +2.37°C] for September (2020-2039 relative to 1986-2005).

⁴⁸ Ministry of Environment. 2014. Jordan's Third National Communication on Climate Change to the UNFCCC.

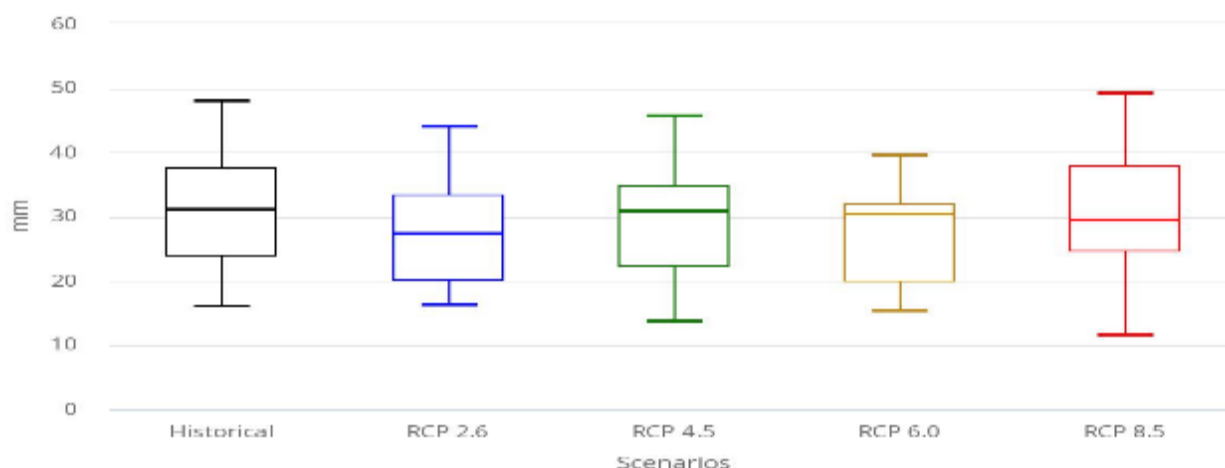
⁴⁹ *Ibid.*

Precipitation. Annual precipitation rates show decreases at most meteorological stations. As warmer air has a higher capacity to carry moisture in form of water vapor, future climate raises the likelihood for strong rainfall events and particularly towards extremes. The 10-year return period rainfall episodes, such as the 5-day cumulative rainfall, is a good measure of these extremes (Figure 8). In many places around the world, the maximum expected amount of rainfall in a 10-year period is projected to increase, which can lead to flooding.

Figure 8. 5-day precipitation: 10-year return level 2040-2059.

Source: World Bank Climate Knowledge Portal.

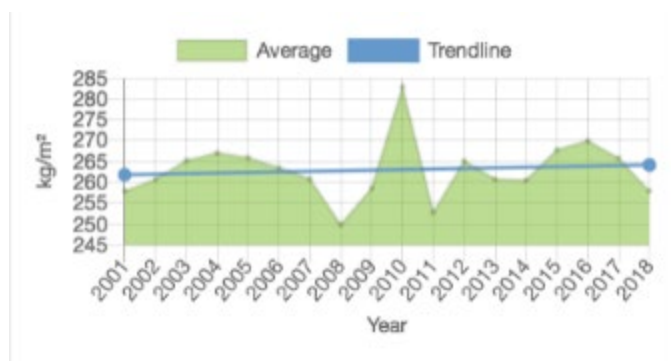
5-Day Precipitation: 10-yr Return Level in Jordan for period: 2040-2059



According to ICARDA simulations⁵⁰, precipitation in the Dead Sea Basin decreased by up to 20% during the 1901-2010. FAO simulations can partly confirm the previous results although the trend appears slightly less evident. Many regions have experienced a decrease in rainfall, and further projections expect this to continue over most parts of the country.

Evapotranspiration. According to FAO, the trend for potential evaporation (Figure 9) shows a slight tendency for increasing in the years from 2001 - 2018⁵¹.

Figure 9. Potential Evaporation trends from 2001 – 2018.



⁵⁰ Ministry of Foreign Affairs of the Netherlands, 2018. Climate Change Profile Jordan.

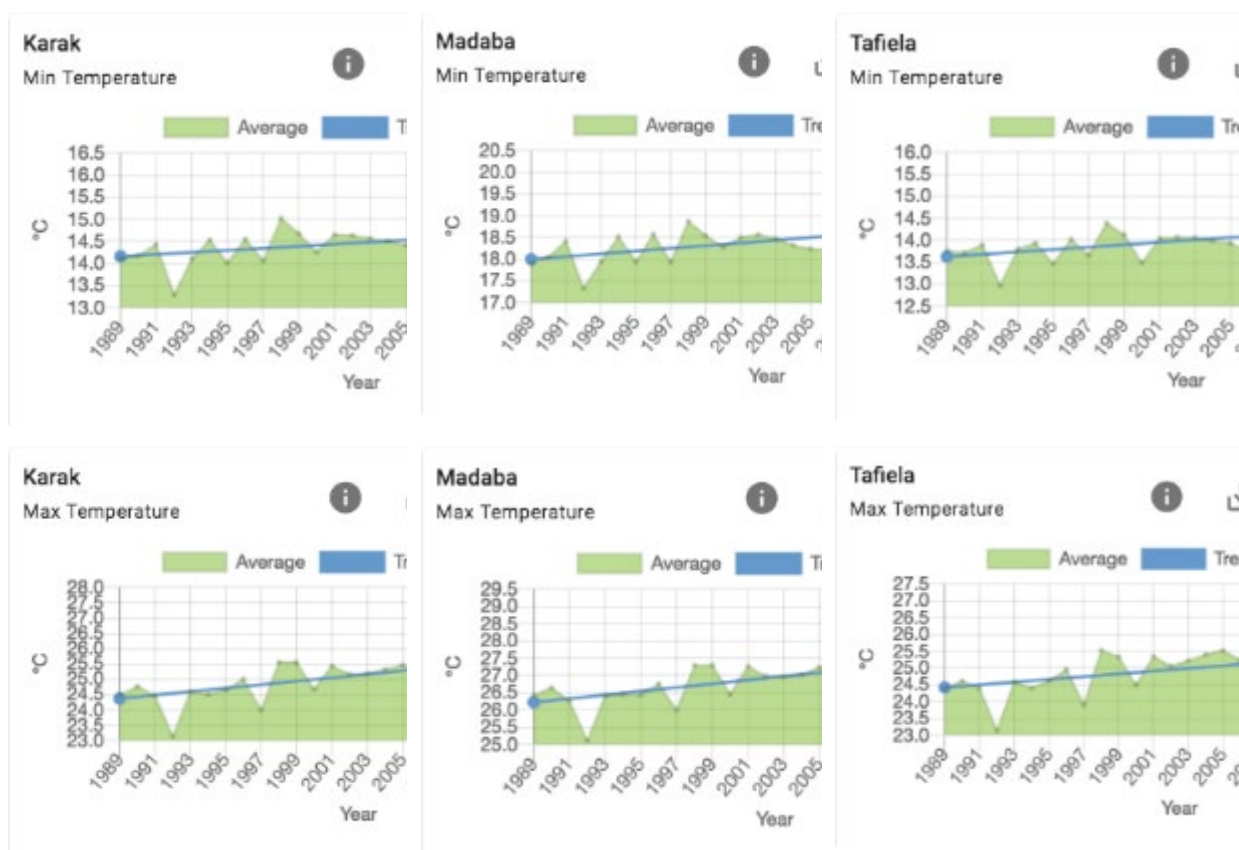
⁵¹ FAO, 2020. Earthmap. accessed at <https://beta.earthmap.org/>

Evapotranspiration is expected to increase significantly for RCPs 4.5 and 8.5 and will be about 150 mm higher. Standardized precipitation indexes indicate that Jordan will experience more drought events especially in winter and spring. Under the RCP 4.5, the number of hot days ($T_{max} > 40^{\circ}\text{C}$) is projected to increase by 20 days (2040-2059 relative to 1986-2005). There will furthermore be noticed an increase in heat waves and consecutive dry days⁵².

Impacts of climate change on temperature and precipitation in the target areas.

Figure 10 a, b, c. a) Minimum Temperature Development in the years 1989 - 2015 of the Governorates Kara, Madaba and Tafilah. b) Maximum Temperature Development in the years 1989 - 2015 of the Governorates Kara, Madaba and Tafilah. c) Precipitation development in the years 1989 - 2015 of the Governorates Kara, Madaba and Tafilah.

Source: FAO, 2020. Earthmap. accessed at <https://beta.earthmap.org/>



⁵² Ministry of Environment. 2014. Jordan's Third National Communication on Climate Change to the UNFCCC.

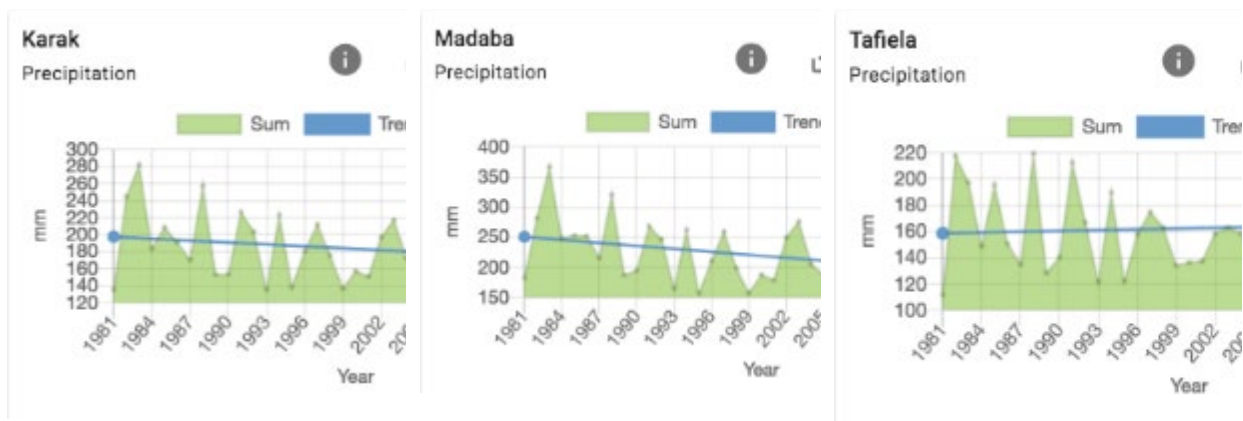
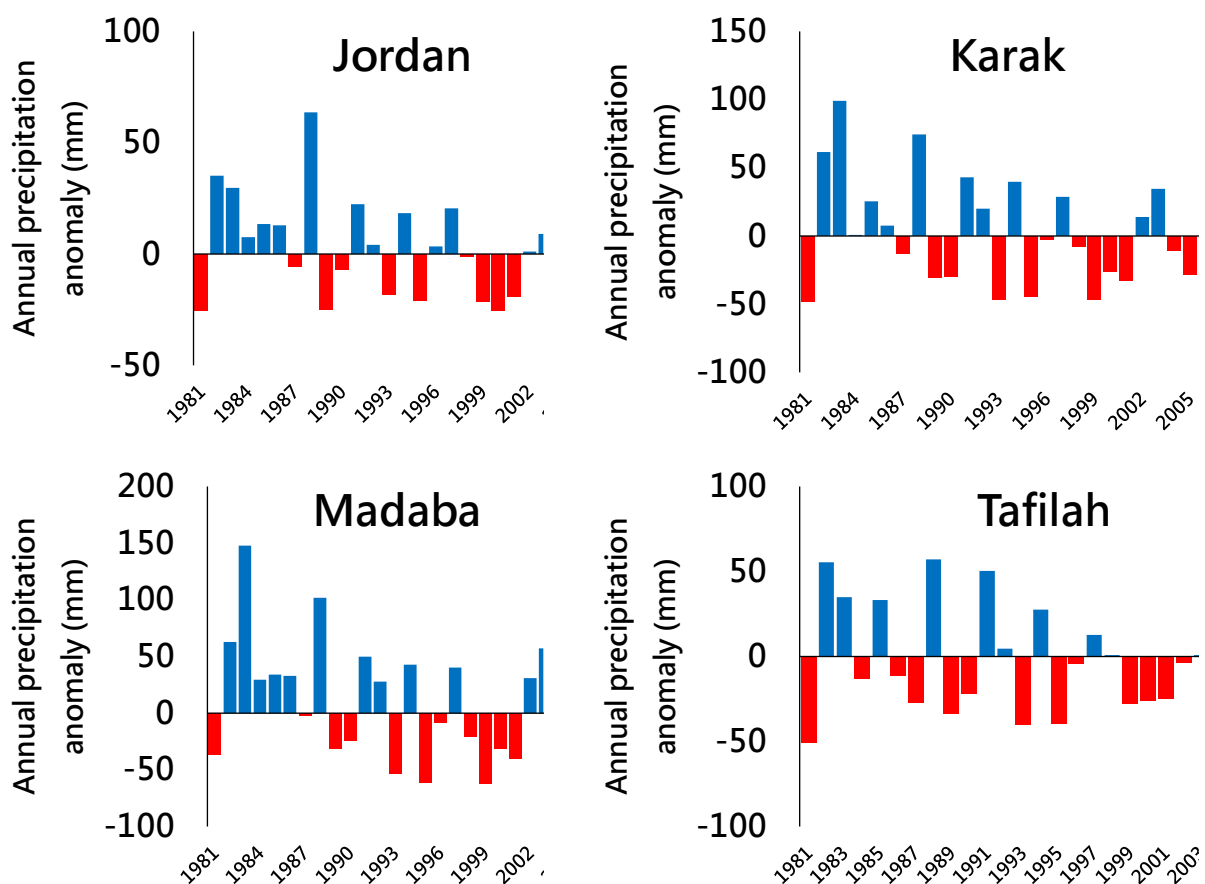


Figure 11. Annual precipitation anomalies in Jordan and the target regions.⁵³



⁵³ Data elaborated by Edoardo Borgomeo (FAO).

3.2.5 Agriculture.

Main agricultural products include citrus, tomatoes, cucumbers, olives, strawberries, stone fruits; sheep, poultry, and dairy⁵⁴. Data from 2016 gives the distribution of cultivated crops as between 31.8 percent fruit trees, 18. percent vegetables and 49.7 percent field crops. The total land area used for agriculture is approximately 1 million hectares. Table 4 breaks down recent statistics for selected land uses. Irrigated farming grew from 27.8 percent in 1995 to 39.1 percent in 2016), indicating a decrease of the production of field crops, which are usually rainfed⁵⁵. Due to urban expansion in the high rainfall zones, rainfed agriculture expanded towards marginal lands of arid and semiarid areas which receive less than 200 mm of annual rainfall. For many years, rainfed agriculture in these areas suffered from droughts and accelerated soil degradation. In these areas, barley is usually cultivated to support the grazing herds whose stocking densities are too high, although since many years grain production is not guaranteed. The majority of the country's rural population depends either directly or indirectly on agriculture for their livelihoods. About 25 percent of the total poor in Jordan live in rural areas, depending mostly on agriculture (livestock keepers, smallholder farm households and landless former agriculturalists), and in spite of poor motivation of the rural youth, agriculture is an important employer of the rural communities.⁵⁶

Table 4. Selected agricultural land uses in Jordan.

Item	Year	Hectares
Country area	2017	8 932 000
Land area	2017	8 878 000
Agricultural land	2017	1 007 000
Cropland	2017	265 000
Arable land	2017	187 000
Land under temporary crops	2017	111 000
Land under temp. meadows and pastures	2008	1 300
Land with temporary fallow	2017	76 000
Land under permanent crops	2017	78 000
Land under perm. meadows and pastures	2017	742 000
Perm. meadows & pastures - Nat. growing	2017	742 000
Forest land	2017	97 500
Land area equipped for irrigation	2017	107 000
Agriculture area actually irrigated	2017	86 500
Cropland area actually irrigated	2017	86 500

Source: FAOSTAT. Accessed March 2020.

According to Jordan's 2009 Second National Contribution to the UNFCCC, agriculture in Jordan is one of the most vulnerable sectors to climate change because the available water and land resources are limited, as most of the country's land is arid and is used as open range. Results of the vulnerability assessment for

⁵⁴ Hashemite Kingdom of Jordan. 2015. National Biodiversity and Action Plan 2015-2020.

⁵⁵ National Adaptation Plan to Climate Change on Jordan. 2020.

⁵⁶ Jordan Third National Contribution to the UNFCCC.

the agricultural sector showed that climate change could have significant impacts, in particular on rainfed agriculture. The livestock sector and the overall food production in the country were identified as most significantly impacted by the adverse impacts of climate change, in particular on rainfed cultivation and on the arid and semi-arid rangelands.

Field crops (e.g. wheat and barley) were found to be highly sensitive to climate change impacts, as a result of reduced time available for assimilation of dry matter and lower water availability⁵⁷. A decrease in yield varying from 7-21 percent for wheat and from 18-35 percent for barley is predicted. For olive production, the potential decrease in yield derived resulting from climate change impacts varies from 5-10 percent, with high evidence for oil quality reduction. For many vegetable crops, high temperatures may decrease quality parameters, such as size, soluble solids and tenderness. It is anticipated that a 1°C or 2°C increase in temperature will decrease vegetables yield by 5 and 10 percent, respectively⁵⁸. Orchards are also highly sensitive to climate change. Using appropriate varieties could help avoid the adverse impacts of temperature increases; planting trees that have high tolerance to higher temperatures could prevent loss of productivity due to global warming. In rangelands, vegetation change is more likely linked to changes in soil resources rather than to the immediate physiological responses of plants to CO₂ concentration or temperature. The increase in evapotranspiration rates, and the decrease in precipitation rates in drier systems would reduce productivity.

The increase in net irrigation requirements and the reduction in crop yield would result in reduced water use efficiency (WUE). A 1°C temperature increase and 10 percent decrease in precipitation would result in decreasing the WUE for all crops planted in Jordan. While there is no clear direct link between the impact of climate change on food consumption patterns, reduced yields of strategic crops and the contribution of rangelands to the livestock sector can indirectly affect food consumption patterns. This would increase prices, and alter consumption patterns as well as sources of nutrients.

Madaba. Approximately 10 percent of the Madaba is agricultural land of which 15 percent has been left fallow in 2015. The rest of the area is used for field crops (55 percent), vegetables (8 percent) and fruit trees (23 percent). Only 0.6 percent of the Zara Maieen Mujib watershed area is currently used for irrigated cultivations. Agricultural production is therefore very vulnerable to the projected decrease in precipitation decrease, especially for field crops that are entirely rainfed and cultivated in flat and semi-flat wadis^{59, 60}. With regards to livestock there are approximately 170 500 sheep; 39 500 goats, 1 700 heads of cattle⁶¹ present and 102 chicken farms that have a production capacity of around 12 000 tons of meat per year⁶².

Karak. Agriculture has been identified as one of the most important economic sectors and approximately 10 percent of the land is suitable for cultivations. 76 percent of this land is used for agriculture, the rest is left fallow. Field crops utilize 64 percent of the land and are entirely rainfed and hence very vulnerable to projected climate change impacts; 5 percent of the land is dedicated to fruit

⁵⁷ Al- Bakri J.T., Suleiman A., Abdulla F. and Ayad J. 2010. Potential impacts of climate change on the rainfed agriculture of a semi-arid basin in Jordan. *Physics and Chemistry of the Earth* (Accepted and available on online Doi:10.1016/j.pce.2010. 06.001).

⁵⁸ FAO, 2012. Assessment of the risks from climate change and water scarcity on food productivity in Jordan.

⁵⁹ Department of Statistics, 2016. Agricultural statistics

⁶⁰ Kalbouneh A, Refiat Bani Khalaf R.B., Ulaimat A. and Hejleh A.A. 2016. CDM Water Resources Protection Plan for Zara – Ma'een – Mujib Project Watershed

⁶¹ Department of Statistics, 2018. Statistical Yearbook

⁶² FAO, 2015. Jordan. Water along the food chain

trees and 6 percent to vegetable production⁶³. Current conditions make farming towards the Dead Sea escarpments less viable as there is insufficient rainfall⁶⁴. Additional contribution to agriculture is livestock farming with approximately 359 200 sheep, 39 500 goats and 100 heads of cattle⁶⁵, intensive chicken farming with 183 chicken farms with a production capacity of around 23 000 tons of meat per year⁶⁶.

Tafilah. Only 2.14 percent of the land area is used for agriculture. Field crops utilize 53 percent of the cultivated land, are entirely rainfed and hence very vulnerable to projected climate change impacts, 25 percent of the land is dedicated to fruit trees and 19 percent to vegetable production⁶⁷. Additional contribution to agriculture is livestock farming with approximately 9 200 sheep, 21 300 goats, 100 heads of cattle⁶⁸ and 31 chicken farms with a production capacity of around 3 000 tons of meat per year⁶⁹.

Ma'an. Given that the governorate is mainly covered by a desert, in particular in the areas east to the highlands, only 0.8 percent of the land is agriculture land. It can be safely assumed that most of the agricultural land is part of the target districts. In these areas the share of land for cultivation is hence much higher. In the whole governorate, 26 percent of the land is left fallow, decreasing the area for cultivation even more. Field crops utilize 49 percent of the cultivated land and are 85 percent rain-fed; 14 percent of the land is dedicated to fruit trees and 3 percent to vegetable production⁷⁰. Additional contribution to agriculture is livestock farming with approximately 233 000 sheep, 1030 00 goats, 100 heads of cattle⁷¹ and five chicken farms with a production capacity of approximately 1,000 tons of meat per year⁷².

3.3 SOCIO-ECONOMIC CONTEXT

3.3.1 National context.

The Hashemite Kingdom of Jordan is an Upper Middle-Income country with a population estimated to be 10.2 million in March 2020⁷³ including 1.3 million refugees from Syria⁷⁴ and other countries⁷⁵. The per capita Gross National Income is USD 4,200 (2018)⁷⁶. The agriculture sector accounted for 6 percent of Gross Domestic Product (GDP) in 2018 (2018), with agriculture employing about 3.4 percent of the labour force⁷⁷. Women comprise around 49.3 percent of the population (2018); the unemployment rate is estimated to have reached 19.2% during the second quarter of 2019; (men 17.1%; and women 27.2% for

⁶³ Department of Statistics, 2016. Agricultural statistics

⁶⁴ Institute of Communication and Computer Systems. Municipality of Karak Sustainable Energy and Climate Action Plan (SECAP)

⁶⁵ Department of Statistics, 2018. Statistical Yearbook

⁶⁶ FAO, 2015. Jordan Water along the food chain

⁶⁷ Department of Statistics, 2016. Agricultural statistics

⁶⁸ Department of Statistics, 2018. Statistical Yearbook

⁶⁹ FAO, 2015. Jordan Water Along the Food Chain

⁷⁰ Department of Statistics, 2016. Agricultural statistics

⁷¹ Department of Statistics, 2018. Statistical Yearbook

⁷² FAO, 2015. Jordan Water Along the Food Chain

⁷³ World Bank June 2019. <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

⁷⁴ Jordan Economic Growth Plan 2018 - 2022 The Economic Policy Council. The Economic Policy Council.

⁷⁵ UNHCR Fact Sheet. May 2019. <https://reliefweb.int/sites/reliefweb.int/files/resources/69826.pdf>

⁷⁶ The World Bank. <https://data.worldbank.org/country/jordan>.

⁷⁷ *Ibid.*

females)⁷⁸. Jordan's market-oriented economy is among the smallest in the region, with insufficient supplies of water, oil and other natural resources.

Despite the substantial foreign financial assistance and an abundance of skilled human resources, the national economy faces complex challenges including a high population growth rate, the continuing influx of refugees and economic migrants, inflationary pressures, persistent rural poverty levels (number of rural poor accounts for 23,279 households or 178,458 individuals - Jordan Poverty Strategy 2013), increasing scarcity of water resources exacerbated by overdrawing of underground water resources and the negative effects of climate change⁷⁹.

Data taken from the 2019 UNDP Human Development Report sets Jordan's 2018 Human Development Index (HDI) value in 2018 at 0.723, putting the country in the high human development category. Jordan is ranked 102 out of 189 countries and territories. When the value is discounted for inequality, however, the HDI falls to 0.617, a loss of 14.7 percent due to inequality in the distribution of the HDI dimension indices. The average loss due to inequality for high HDI countries is 17.9 percent and for Arab States it is 24.5 percent. The Human inequality coefficient for Jordan is equal to 14.7. The 2018 HDI value for females in Jordan is 0.654, as opposed to 0.754 for males, resulting in a Gender Development Index (GDI) value of 0.868.

3.3.2 Gender.

Jordan's Gender Inequality Index (GII) is 0.469, ranking it 113 out of 162 countries in the 2018 index. Female participation in the labour market is 14.1 percent compared to 64.0 for men. The most recent survey data that were publicly available for Jordan's Multidimensional Poverty Index (MPI) estimation refer to 2017/2018. In Jordan, 0.4 percent of the population (42 thousand people) are multidimensionally poor while an additional 0.7 percent are classified as vulnerable to multidimensional poverty (67 thousand people). The breadth of deprivation (intensity) in Jordan, which is the average deprivation score experienced by people in multidimensional poverty, is 35.4 percent. The MPI, which is the share of the population that is multidimensionally poor, adjusted by the intensity of the deprivations, is 0.002⁸⁰.

The role of women in economy of rural areas is known to be substantial. Women in these areas are traditionally responsible for the household economy and are active in field work as well. Any negative impact of climate change will be most sensed by women. Women make crucial contributions in agriculture and rural enterprises in drylands as farmers, animal husbandry, workers and entrepreneurs through their indigenous knowledge.

The relation of climate change with gender and poverty is apparent in the following issues:

- Their dependence on natural resources. 20 percent of the population depends on agriculture for their income, and vulnerability in agriculture (especially rainfed and irrigated areas) is high. Therefore, it is this poorest segment that will be most susceptible to climate change impacts.
- Dependence of vulnerable communities on ecosystem services (water springs, rangelands and natural vegetation in medicine, etc.) that could be affected by climate change.

⁷⁸ Department of Statistics. Government of Jordan. 2019

⁷⁹ IFAD. 2016. Jordan Country Strategy Report.

⁸⁰ 2019 UNDP Human Development Report. Inequalities in Human Development in the 21st Century. Briefing note for countries on the 2019 Human Development Report. Jordan.

- A lack of assets which hinders effective adaptation by the poorer and most vulnerable segments of the population.
- The linkage between women and socio-economic impacts resulting from climate change, primarily through the disruption of livelihood options that depend on natural resource management. Current gender inequalities are expected to be exacerbated.
- Settlements in high-risk areas (i.e. drought prone) in Jordan are known to be of the lower income groups, a fact which magnifies the impact of climate change on poverty of these groups.
- Low levels of education and professional skills that prevent members of poor households for shifting to climate-resilient sources of income.

3.3.3 Poverty in target areas.⁸¹

The poverty rate in the four Governorates in the project area is above the national average (13.3%), with 24.2% in Ma'an, 21.1% in Tafilah, 17.1% in Karak and 14.9% in Madaba⁸². These rates have been further exacerbated over time. According to the most recent official estimates, poverty rates have increased to an estimated 20% in 2016.¹ In addition, there is a large proportion of people who experience transient poverty and are especially vulnerable to climate risks.

Madaba. Madaba has a total entrepreneurial activity (TEA) of 4.3 percent which is lower than the national average of 8.2 percent. In addition, the poverty rate of Madaba is 14.9 percent which is slightly higher than the national average of 13.3 percent; the percentage of vulnerable households is 22.8 percent, corresponding to 6 330 households (HH). Inequality rates show a high GINI coefficient (27.2 percent) and the unemployment rate is the second highest at 23.2 percent, compared to the national average of 18.6 percent. In 2008, 5.7 percent of the population was recipient of the National Aid Fund (NAF), which is the main poverty reduction programme of the Kingdom. In this vulnerable group, 76 percent are either food insecure (17 percent) or vulnerable to food insecurity (59 percent).

At approximately 22 percent, the share of the rural population is much higher than the average national rate of 9.7 percent. In general, poverty in rural areas is more recurrent than in urban areas and on a national level 19 percent of the rural population is classified as poor. Those employed in the agricultural sector are furthermore poorer than the ones working in other sectors. Smallholders that are dependent on rain fed areas are especially vulnerable to irregular rainfall and droughts.

Karak. In 2011, 2.7 percent of the employed inhabitants worked as "skilled agricultural, forestry and fishery workers". Similar to Madaba, the main current occupations were "service and sales worker" (31.1 percent) and "professionals" (24 percent). In 2018, the unemployment rate was 15.4 percent and therefore lower than the national average of 12.2 percent. Interestingly, Karak has the second highest rate of entrepreneurial activity with 11.3 percent, which is even higher than in the capital and economic center Amman, showing that there is potential among the adult population for creating business and job opportunities. Average poverty level of the Governorate is 17.1 percent which is slightly below the average national rate. In addition, the amount of vulnerable HH is with 20.8 percent lower than the national average.

There are however also indicators that show the particular vulnerability of the Governorate: the region

⁸¹ This section is entirely extracted from the Working Paper on "Climate Change and Environment in Jordan" of the Full Project Funding Proposal and Feasibility Study.

⁸² The Economic Policy Council, Jordan Economic Growth Plan 2018 – 2022.

has a high inequality rate (GINI=29.7 percent) and with 40 percent, the governorate has one of the highest shares of rural population in the country. As previously pointed out, poverty is a particular recurrent phenomenon in rural areas. In fact, areas to the east and west clearly show a high poverty ratio (see Figure 14), and are considered poverty pockets⁸³.

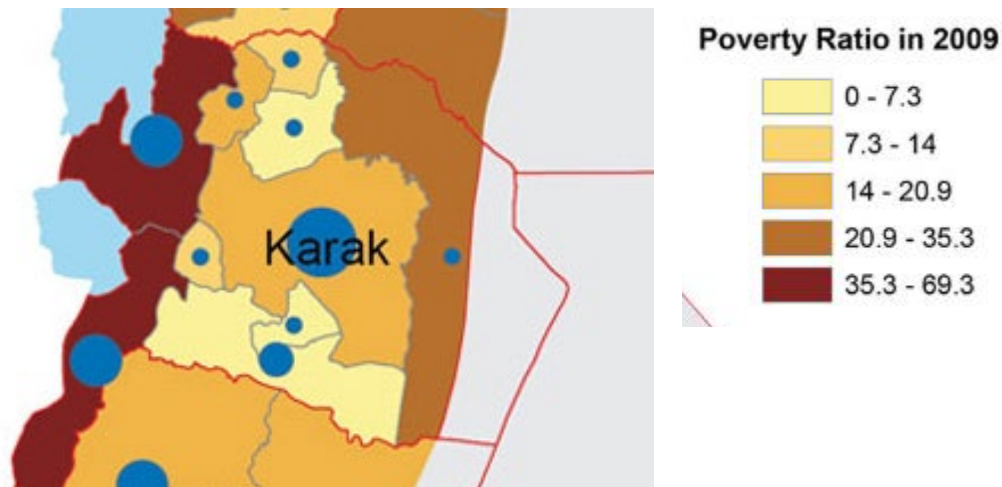


Figure 12. Poverty ratio in the Governorate Karak in 2009. Adapted from Lenner, 2010.

These areas are however also the ones where activities for sustainable agriculture have a high potential for enhancing sustainable development, as the rural poor are highly reliant on the sector

Tafilah. Tafilah has the highest national unemployment rate with 23.5 percent. Average poverty level of the Governorate is 21.1 percent and the amount of vulnerable HH 26.4 percent, both values are significantly higher than the national average. The region has the second lowest inequality rate (GINI = 23.6 percent) and a rural population of 22 percent, one of the highest shares in the kingdom. As previously pointed out, poverty is a particular recurrent phenomenon in rural areas.

Ma'an. Ma'an has an above national average unemployment rate of 20.5 percent; at 24.2 percent, the poverty rate is the highest in the country. In addition, also the share of vulnerable HH is with 28.4 percent significantly higher than the national average. The inequality GINI rate is 26.3 percent and with 46 percent, the governorate has the highest shares of rural population in the country. Poverty is a particular recurrent phenomenon in rural areas.

3.3.4 Land tenure.

Different types of land tenures are found in Jordan based on the land right system that was used in the Ottoman Land Law: 1) Mulk: absolute ownership of the land; 2) Meeri: legally owned by the state but is under perpetual lease to the occupier, who has inherited right of disposal; 3) Waqf: This land is inalienable religious endowment; 4) Mawaat unoccupied land, which has not been left for public use; usually it is too far from urban activities; 5) Matrouk: set aside land for public use; and 6) Masha'a: village land that is

⁸³ Poverty pockets are areas with a poverty rate higher than 25 percent.

usually planted with field crops and owned collectively under tribal tenure (tribal fronts). For the purpose of this project, land tenure and any related infringements upon are not an issue.

With regards to Waste Water Treatment Plants (WWTP), Jordan's Decentralized Wastewater Management Policy establishes that the day to day responsibility for the monitoring and revision of the Policy and its Action Plan rests in equal shares with the Secretary General of the MWI and the Secretary General of the WAJ supported by the Secretary General Assistant for Strategic Planning of the MWI. Communities are involved in planning and implementation, and the private sector is involved in investing and operating for the maintenance of the wastewater infrastructure. Contracts are made between farmers and WWTPs, which establish fees to be paid for irrigation water coming from WWTPs. For rooftop water harvesting structures at the household level, the beneficiary must show evidence of their ownership of the house. For rooftop water harvesting structures on public buildings, municipal buildings are under the responsibility of the Municipalities; schools and university buildings are under the responsibility of the Ministry of Education; and rainwater harvesting structures at research centers (i.e. NARC) fall under the responsibility of the Ministry of Agriculture.

4. POLICY AND LEGAL FRAMEWORKS

The following chapter provides an overview of Jordan's existing national policy and legal framework, and nationally signed and ratified international treaties, as applicable to the BRCCJ project.

4.1 JORDAN REGULATORY FRAMEWORK⁸⁴

The BRCCJ project is designed to support the Hashemite Kingdom of Jordan's policies, regulatory framework and strategies to ensure strong country ownership. The BRCCJ is aligned with Jordan's Climate Change Adaptation (CCA) commitments, priorities and identified adaptation actions for water and agriculture, including the National Climate Change Policy and Sector Strategic Guidance Framework of the Hashemite Kingdom of Jordan (2013-2020), the Nationally Determined Contribution (NDC), the Technology Needs Assessment (TNA), the National Water Strategy (2016-2025) and the Royal Initiative for Economic Change "Jordan 2025 - A National Vision and Strategy". The project supports the objectives of the climate change policy (2013-2020) by building the adaptive capacity of communities and institutions in Jordan, addressing the needs of vulnerable groups including women, increase the resilience of water management systems as well as the agricultural sector to climate change. Prioritized adaptation measures for the agriculture sector identified in the National Adaptation Plan (2020)⁸⁵ have been included in the project proposal. The project is also aligned with the adaptation measures and programs identified in the NDC and TNA for groundwater protection, surface water development, demand management for agriculture and water resources monitoring. Lastly, the project is in line with the country's Green Growth Plan (2017) which stresses the importance of building rural resilience by diversifying incomes, ensuring resource availability and reducing environmental impacts.

National Green Growth Plan for Jordan (NGGP) (2017). Reflecting national development priorities, two sectoral priorities of the NGGP of relevance to the BRJJ are agriculture and water. Main interventions in

⁸⁴ Except where otherwise indicated, the information for this section has been extracted from the FAOLEX Database: Jordan - Country Profiles (<http://www.fao.org/faolex/country-profiles/general-profile/en/?iso3=JOR>).

⁸⁵ An advanced draft was made available to FAO in February 2020. The mandate for Jordan's NAP stems from the recently endorsed Climate Change Regulation of 2019, National Climate Change Policy of the Hashemite Kingdom of Jordan 2013-2020 and Jordan's NDC document.

agriculture are directed towards: (i) improving the agricultural productivity of land which is currently not being used for agriculture; and (ii) introducing new crop varieties. With regards to water, the NGGP proposes (i) to increase treatment plants to reuse current water resources and avoid environmental side effects such as water pollution; and (ii) manage water demand and efficiency, including metering and improving water infrastructure. Within this plan, rural poverty reduction will be pursued in a number of ways including the introduction of drought-tolerant varieties to help rural communities to primarily become more resilient to adverse effects of climate change.

Jordan Economic Growth Plan 2018–2022. The plan outlines that preventive measures will be taken for food security, food availability and access to food. Making agriculture more productive and sustainable is an objective that would be achieved in a number of ways, including increasing the efficiency of water use available for irrigation, and encouraging the cultivation of high yield crops and the use of improved and drought resistant seeds. The plan further outlines that water supply will be increased by replacing fresh water from surface and groundwater sources with treated wastewater from wastewater treatment plants. Water management will be integrated and projects on increased water quantity, water harvesting, water conservation, efficient use of water and energy sources in the water sector will be carried out. Women will be empowered, and their contribution to the labor force will be increased to activate their economic participation.

Agriculture.

National Strategy for Agricultural Development 2016-2025. The policy aims to achieve results in ten main areas, including: (i) high agricultural productivity; (ii) efficiency in the use of irrigation water; (iii) high use of technology; and (iv) high partnership between public and private sectors. In order to make agriculture, forestry and fisheries more productive and sustainable, the Strategy provides for nine areas of action, including: (i) improving irrigation water quality and efficiency introducing high-yielding horticultural and pastoral plant varieties under drought conditions, using non-conventional water and protecting it from pollution and salinity; (ii) improving irrigation water drainage systems in the Jordan Valley; and (vii) facilitating the access to treated water.

Agriculture Law No. 13 (2015). This law is one of the critical enablers focusing, among other matters, on the improvement of the quality of life of farmers, the efficiency of water use for irrigation, and on need for scientific research and desertification control.

Other legislation concerning (agricultural) land and soils are:

Regulation No. (Z/8) of 2009 concerning the protection of agricultural land.

Soil Protection Regulation No. 25 of 2005.

Climate change.

National Climate Change Adaption Policy of the Hashemite Kingdom of Jordan 2013-2020.

The objective of this policy is to build the adaptive capacity of communities and institutions in Jordan, with consideration for gender and addressing the needs of vulnerable groups, to increase the resilience of natural ecosystems and water as well as agricultural climate change, and to optimize mitigation opportunities. The national priorities and pillars of the climate change policy are adaptation to climate change and mitigation of greenhouse emissions, with an emphasis on adaption as the imperative track.

Regarding the reduction of the rural poverty, the government is planning to implement, among others, strategies including: (i) building capacity at all levels to design and implement gender responsive climate change policies, strategies and programs; and (ii) developing, compiling and sharing practical tools,

information, and methodologies to facilitate the integration of gender into policy and programming. To increase the resilience of livelihoods to disasters, the government plans measures of adaptation to climate change in agriculture, food security/production, desertification, and land-use planning. Among others, strategies include: (i) increasing the knowledge and insight of climate change's impact on agriculture/food productivity/food security, and desertification, which is necessary to identify the priority adaptation measures; (ii) increasing insight on the linkages between the adaptation strategies in the agricultural sector and in other sectors, particularly the water sector; (iii) strengthening the linkages between agriculture sector planning with planning in other sectors, especially the water sector; and (iv) working with communities to integrate climate change concerns into sustainable agricultural management practices, and work with local water users to integrate climatic change concerns into irrigation regimes for sustainable agriculture.

The National Crisis and Disaster Management Strategy for Agriculture 2016 - 2025. In this strategy, interventions aimed at eliminating hunger and food insecurity include, among others: (i) encouraging the cultivation of drought-resistant crops, especially in rain-fed areas; (ii) supporting research on the production of seeds adapted to drought; (iii) following up the program of monitoring the quality of irrigation water; (iv) promoting land reclamation and on-farm water harvesting; and (v) restoring irrigation networks in cooperation with the competent authorities and owners of adjacent farms.

Water.

Water for Life: Jordan Water Strategy 2008-2022. The objectives of the Strategy are: (i) adequate, safe and secure drinking water supply; (ii) greater understanding and more effective management of groundwater and surface water; (iii) healthy aquatic ecosystems; (iv) a sustainable use of water resources, and implemented fair, affordable and cost-reflective water charges; and (v) adaptation to increased population growth and economic development across the water sector and water users. The goals are defined in the following sectors: water demand, water supply, institutional reform, water for irrigation, wastewater and alternative water resources. The Strategy aims at making agriculture more sustainable through the rational use of water resources in agriculture, particularly as regards irrigation.

National Water Strategy of Jordan (2016-2025). There are four strategy key areas in Jordan's National Water Strategy. Most relevant to the BRCCJ are: (i) Integrated Water Resources Management (IWRM); and (ii) water for irrigation, energy and other uses. The National Water Strategy of Jordan is implemented through a series of plans and policies, including four national policy and strategy documents and six sector policies which provide guidance for Jordan's water sector. These are:

1. Water Sector Capital Investment Program.
2. Water Demand Management Policy.
3. Energy Efficiency and Renewable Energy in the Water Sector Policy.
4. Water Substitution and Re-Use Policy.
5. Water Reallocation Policy.
6. Surface Water Utilization Policy.
7. Groundwater Sustainability Policy.
8. Climate Change Policy for a Resilient Water Sector.
9. Decentralized Wastewater Management Policy.
10. Action Plan to Reduce Water Sector Losses (Structural Benchmark).

Among those with greatest pertinence to the BRCCJ are:

Water Sector Capital Investment Plan 2016 – 2025. Aims at securing water supply, developing new water resources that will enhance the water allowances per capita, providing access to improved water supply, and expanding the wastewater services and coverage all over the Kingdom.

Climate Change Policy for a Resilient Water Sector. The overall goal of the Policy is to build resilience in Jordan's water sector to respond to the combination of climate change and other disturbances and shocks. Guiding principles of this policy are: (i) resilience; (ii) Integrated Water Resources Management (IWRM); and (iii) adaptive management. IWRM encompasses many water-related solutions, including water storage, water harvesting, wastewater collection/treatment/reuse, and training and capacity development.

Water Demand Management Policy. Stressing behavioural change, the policy's main objective is to maximize the utilization of the available water and minimize water losses and conserve water resources. This policy is presented in two parts. Part 1 targets the municipal, tourism and industrial sectors and sets a series of procedures and measures to address, *inter alia*, reduction of water losses; use of Non-Conventional water resources (greywater, industrial water treatment and obligatory water harvesting system); and introduction of the concept of water value as a key element of water demand management. Part 2 aims at constituting a guide for action and measures to save water resources while maintaining or increasing agricultural production. These measures include: i) substitution and re-use, with the aim of managing scarce water resources efficiently and maximize the benefits and returns from the use of treated wastewater for non-drinking use; ii) efficient use of water in irrigation by introducing modern technologies and advanced irrigation systems; and iii) water harvesting through dams, ponds and excavations, especially in the highlands and desert areas.

Decentralized Wastewater Management Policy. Refers to WWTPs with a capacity of up to 5,000 Population Equivalent (PE). The main objective is to formulate a decentralized wastewater management within an integrated water resources management approach, taking into account the concept of involvement at all levels: of the concerned authorities in its development, of communities in its planning and implementation and of the private sector in investing and operating for the maintenance of the wastewater infrastructure. Advantages of this policy are that they: (i) ensure the protection of groundwater from pollution with untreated wastewater; (ii) provide most cost-efficient adequate wastewater collection and treatment systems covering to the best extent possible all types of wastewater management demands; (iii) provide alternative water resources for fresh water substitution; and (iv) expand connection to sewerage by implementing decentralized wastewater management where centralized sewerage cannot reach.

Water Reallocation Policy. Sets action plans for redistributing the water flexibly between sectors and governorates. The water resources considered in the policy include wastewater (for industrial, agricultural, cooling and other uses except for drinking purposes), and reclaimed water (for industry and agriculture).

Water Substitution and Reuse Policy. Aims at a more efficient use of water resources through reusing treated wastewater in irrigation that enables freeing fresh water for municipal uses. For agriculture, to make it more productive and sustainable, the policy proposes an increased use of treated wastewater for irrigation. Jordan has a Risk Monitoring System for water reuse in place.

The Jordanian standard for wastewater and water reuse is based on WHO guidelines with some modifications to meet local requirements and conditions (Jordanian Standard 893/2006).

The existing standards and laws that directly apply to wastewater reuse are the:

- Water Authority of Jordan Law No.18/1988 and its amendments.
- Jordanian Standard No. 202/2007 for Industrial Wastewater Discharges.
- Jordanian Standard 893/2006 for Discharge of Treated Domestic Wastewater.
- Jordanian Standard No. 1145/2006 regarding the Use of Sludge⁸⁶.

Energy Efficiency and Renewable Energy Policy. The aim is to promote energy efficiency and renewable energy usage in the water sector with the purpose of boosting Jordan's energy autonomy by improving cost recovery, utilizing renewable energy technologies for power supply at the water facilities, ensuring a more productive use of energy and reducing CO2 emissions. Two pillars on which the policy is based are: (i) optimization and rehabilitation of water infrastructure in order to reduce power demand for pumping and pressure drop in the network, and ensure the sustainability of the operation and maintenance in the future of the water supply facilities; and (ii) introduction of economically feasible and environmentally friendly power generation systems based on renewable energy resources with the aim of diversifying energy resources and to reduce reliance on energy imports.

With regards to developing water efficiency standards, the MoWI is working with the Jordanian Institute for Standards and Metrology (JISM) in developing plumbing standards and technical regulations for efficient water use. Currently, standards for lavatory faucets, kitchen faucets, toilets, and showerheads are developed and approved by the plumbing products technical committee. The Ministry of Water and Irrigation is working with the Jordanian Building National Council (JNBC) to modify and update the Jordanian National Water and Sanitation Plumbing Code, to integrate water efficiency standards in the code. Lastly, the MoWI has been supporting the Royal Scientific Society (RSS) in the establishment of a water testing facility to test local and imported water plumbing products for compliance with technical regulations for water use efficiency. This effort will support the enforcement of the standards and technical regulations to clean the Jordanian market from inefficient plumbing fixtures and appliances⁸⁷.

Groundwater Sustainability Policy. Its main objective is to promote an optimal and sustainable management of groundwater resources to be saved for future generations. Among other things, it encourages the use of treated wastewater, especially in agriculture, in order to protect fresh water resources.

Surface Water Utilization Policy. The objective is to work towards the maximum utilization and optimum use of surface water, its protection, its management, and propose measures needed towards successfully integrating all its components. The water resources development shall permit to tap the full potential of surface water and an integrated development and conservation program shall be established to increase it. Supply-enhancing measures shall be adopted, such as surface and subsurface storage, rehabilitation of existing water supply infrastructure, removing/managing sediments, and taking measures to reduce the impact of climate change. Another focus regards the quality of treated waste-water which shall meet the national

⁸⁶ Refer to the Water Sector Working Paper.

⁸⁷ Refer to the Water Sector Working Paper.

standards, monitored and reviewed, with particular attention to the water supplies for potable use.

Instructions No. G/7 of 2016 - Instructions and Conditions for the use of wastewater, treated water, saltwater and brackish water for agricultural uses issued under Article 15/C of the Agriculture Law No.13 of 2015 and its amendments. Consisting of 27 articles, these instructions give, in particular, rules for obtaining from the Ministry of Agriculture a permit to use reclaimed wastewater for irrigation, and a list agriculture and crops that can be irrigated by reclaimed wastewater (treated). They ban: the use of untreated wastewater for irrigation; the use of reclaimed wastewater for water for animals; the transportation of reclaimed wastewater in tanks without obtaining a permit; the use of reclaimed wastewater for irrigating areas close to wells or other drinking water sources without previous analysis; the use of reclaimed wastewater to irrigate vegetables to eat raw; grazing in fields irrigated with treated wastewater. They also indicate when sprinkler irrigation is allowed; give watering times before harvest; give conditions and requirements for the use of treated wastewater for irrigation and warnings for consumers of products irrigated with treated wastewater. The Instructions also deal with agriculture and crops that can be irrigated with saline water (salinity within the limits indicated in detail) and transport of this waters.

Jordanian Standard JS 893/1995; 2002; 2006.

The Jordanian Standard for water reuse was issued in 1995, and revised in 2002 and later in 2006. In essence, it sets standards for wastewater treatment plants (e.g. for monitoring water quality) and also for how treated wastewater can be used. In JS 893/1995, there were seven categories of reuse, whereas now there are three main categories:

- (i) Discharge of water to streams or wadis or waterbodies.
- (ii) Use for artificial recharge of groundwater aquifers.
- (iii) Reuse for irrigation:
 - a) Cooked vegetables, parks, playgrounds, and sides of roads within city limits.
 - b) Fruit trees, sides of roads outside of city limits and landscapes.
 - c) Field crops, industrial crops and forest trees.

Environment.

Ministry of Environment Strategic Plan (2017 - 2019) - Vision of 2025 Foreseeing the Future.

The Plans presents five strategic objectives: (i) to protect and conserve ecosystems and biodiversity; (ii) to prevent and reduce the negative impacts on the environment caused by pollution and climate change; (iii) to develop capacities and anchoring the excellence culture; (iv) to raise public awareness and behaviour change on environmental protection; and (v) to improve partnership with the private sector in priority sectors management. In order to make agriculture more productive and sustainable, the Strategy proposes (i) a reduction of climate change negative impacts especially on both, the water and agricultural sectors; and (ii) projects for the introduction of irrigation pumps operating by solar energy. To increase the resilience of livelihoods to disasters, main actions are focused on coping with the climate change challenges to combat its impact caused by pollution and deficiency in services such as water and sanitation. These actions include (i) monitoring groundwater quality; (ii) improving the quality of life and green infrastructure in Amman to mitigate and adapt to climate change; (iii) development of a National Adaptation Plan Process for climate change; (iv) a climate change technical needs assessment.

Environmental Protection Law No. 6 of 2017.

This Law consisting of 33 articles aims at protecting the environment providing that (i) the Ministry of Environment is the authority responsible for environmental protection; (ii) the Ministry together with the

related parties shall develop the policies and prepare the plans and programs, work on forecasting climate change identifying the involved sectors, follow the implementation of international environmental agreements, protect the biodiversity identifying areas that need special attention, protect water sources, issue environmental permits for activities that have a strong impact on the environment, establish the principles governing use and circulation of hazardous substances, gather environmental information and establish a national environmental database, and prepare emergency and disaster management plans. The Law deals also with permits for facilities; harmful substances and rules for their entry, import, storage, circulation and use; management of hazardous waste; management of liquid and solid waste; and the establishment of an environmental protection Fund (Environmental Protection Fund Law No. 18 of 2018). The Environmental Protection Law is supported by the Regulation of the Department of Environmental Protection No. 37 of 2018.

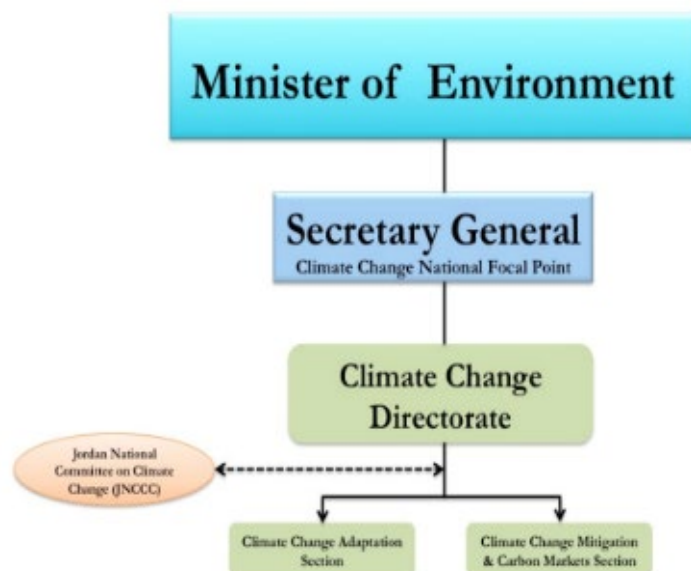
Labour. When employing workers, Jordanian labor laws must be adhered to. International Labor Organization (ILO) labor rights have been adopted by the Government of Jordan; Jordan joined the ILO in 1956. The primary piece of legislation governing employment in Jordan is the Jordanian Labour Law No. (8) of 1996 ('Labour Law'), supported by regulations, instructions and decisions; it was amended by Law No. (14) of 2019 issued in the *Official Gazette* mid-May 2019 ('Amended Law'). There are 12 chapters, covering a range of employment-related issues, including, among others: labour inspection, contracts of employment; subcontracting work and termination or suspension of contracts of employment in certain economic or technical conditions; vocational training contracts; protection of remuneration; organization of work and leave time; minimum age and protection of young workers; and occupational safety and health. The amended law introduces the concept of "wage discrimination," defined as wage inequality between employees based on gender; employers that discriminate against employees by setting wage rates based on gender are subject to a penalty.

4.2 JORDAN INSTITUTIONAL FRAMEWORK

The Ministry of Environment (MoE) is the national focal point for the United Nations Framework Convention on Climate Change (UNFCCC), and operates under the mandate of Environment Protection Law. The MoE is the responsible entity for climate change planning and created the Climate Change Directorate (CCD) to fulfill the provisions of and for transferring the necessary communication to the UNFCCC. The CCD supervises the implementation of climate change policy, and the National Climate Change Committee on Climate Change (NCCC), in which the MoE collaborates closely with the Ministry of Agriculture, the Ministry of Health, the Ministry of Water and Irrigation (MWI) and Ministry of Energy and Mineral Resources (MEMR) and other Ministries (Figure 15).

The Ministry of Water and Irrigation (MoWI) is responsible for overall national leadership on policy, strategic direction and planning, in coordination with the Water Authority of Jordan (WAJ) and the Jordan Valley Authority (JVA). Under By-law No. 14 of 2014, MWI assumes full responsibility for water and public sewage and all related projects in the Kingdom. MWI aims to upgrade, develop and regulate the water sector and enhance the quality of water services. It has a mandate to: develop sectoral policies and strategies; endorse plans and programs related to water resources protection; implement international agreements; develop laws, by-laws, regulations and normative and technical standards; develop private sector partnerships; supervise the implementation of strategic plans and programs; and follow up on the performance of the water companies and utilities.

Figure 13. National climate change institutional framework.⁸⁸



The WAJ is responsible for the operational management of the water sector, which includes bulk water supply and retail distribution where commercialization of distribution services has not occurred. The WAJ is mandated for all operational functions of the water sector including management of water and wastewater services; regulation of construction and quality of service provision projects, operations and maintenance; monitoring of all levels of sector services; and supervision of the water utilities and water companies through the Program Management Unit (PMU). WAJ continues to manage all contracts with the water companies through the PMU, and WAJ and JVA recommend water service cost changes and capital projects; the Cabinet has ultimate regulatory authority, especially for tariffs.

This institutional set-up, however, will be changed as per a new law: on 16 February, 2020 the Jordanian Cabinet approved this draft law, which merges the MoWI and the WAJ. According to the draft law, the MoWI will exercise all the functions and powers of the WAJ and its board of directors as stipulated in the Water Authority Law. The JVA supported the creation and development of Water Users' Associations (WUAs) in the Jordan Valley and has transferred some operational functions for secondary and tertiary irrigation water delivery to these WUAs.

4.3 REGULATORY FRAMEWORK FOR ENVIRONMENTAL IMPACT ASSESSMENT (EIA) IN JORDAN

Environmental Impact Assessment Regulation No. 37 of 2005.

This Regulation contains 21 articles and 5 Annexes. Articles 1 and 2 deal with terms and definitions. Article 3 defines the Environmental Impact Assessment. All agricultural, industrial, commercial, housing and tourism projects shall obtain a previous environmental approval from the Ministry of Environment (art. 4). Article 5 provides for the establishment of the Technical Committee at the Ministry of Environment

⁸⁸ FAO. 2018. An assessment of policies, institutions and regulations for water harvesting, solar energy, and groundwater in Jordan: A review and gap analysis. <http://www.fao.org/3/i8601en/i8601EN.pdf>

formed by 11 specialists to study Environmental Impact Assessments. Article 7 deals with the internal organization and management of the aforementioned Committee. Articles 8-16 deal with matters related to applications, different steps for the environmental approval of projects, classification of the projects, obligations to be taken by owners of projects, etc. Article 17 entrusts the Ministry of Environment with the periodic monitoring of projects. Article 20 fixes fees and taxes for different projects. Article 21 entrusts the Minister to issue the necessary implementing regulations. Annex 1 contains general information on projects requiring and necessitating an initial or total Environmental Impact Assessment. Annex 2 lists projects requiring and necessitating a total Environmental Impact Assessment. Annex 3 contains projects requiring and necessitating an initial Environmental Impact Assessment. Annex 4 contains standards and criteria to be taken for carrying out an initial environmental impact assessment. Annex 5 contains clauses included in environmental impact assessment studies.

Environmental Control and Inspection Act No.65 of 2009 issued under paragraph (a) of art.25 of the Environment Protection Law No. 52 of 2006.

This Act consisting of 15 articles aims at controlling Jordan facilities to assess their compliance with the legislation issued to limit environmental pollution together with organizing the environmental inspection procedures. It also provides for: kinds of inspections (art.4); classification of the facilities for inspection purpose (art.5); rules for environmental inspectors (art.6); inspection reports (art.7); environmental audit requests (art.9); functions of the Environmental Inspection and Control Directorate at the Ministry of the Environment (art.10); commitments of plant owners (art.12).

A summary of responsibilities of relevant governmental authorities related to Jordan's Environmental Impact Assessment is outlined below.

Table 5. Summary of Institutional Roles of Selected Relevant Regulatory Agencies.

Authority	Institutional Roles / Responsibilities
Ministry of Environment	<ul style="list-style-type: none"> • Permitting prior to operation (EIA report is required) • Inspection during operation
Ministry of Labour	<ul style="list-style-type: none"> • Permitting prior to operation (after the occupational health and safety measures are considered) • Inspection during operation
Ministry of Health	<ul style="list-style-type: none"> • Inspection during operation
Ministry of Water and Irrigation	<ul style="list-style-type: none"> • Permitting prior to construction (identification of intersection with water piping distribution Framework). • Supplying water needs for the project
Ministry of Tourism and Antiquities (MOTA)	<ul style="list-style-type: none"> • Permitting in case of existence of archaeological remains
Ministry of Transport	<ul style="list-style-type: none"> • Responsible for setting accidents' prevention measures and developing them under the international requirements
Ministry of Energy and Mineral Resources	<ul style="list-style-type: none"> • Supplying electricity needs for the project
Civil Defense	<ul style="list-style-type: none"> • Approval for construction plans • Permitting prior to operation

Ministry of Housing and Public Works	• Permitting prior to construction
Ministry of Industry and Trade	
Department of Land and Survey	
Public Security Directorate	• Permitting prior to construction. • Permitting during operation

4.4 RELEVANT INTERNATIONAL CONVENTIONS AND TREATIES

The Hashemite Kingdom of Jordan is signatory of several Multilateral Environmental Agreements (MEAs), including:

1. UN Framework Convention on Climate Change (Ratified: 12 November 1993)
 - Paris Agreement (Ratified: 08 November 2016)
 - Kyoto Protocol (Ratified: 17 January 2003)

Under the United Nations Framework Convention on Climate Change (UNFCCC), Jordan submitted its Third National Communication (TNC) in 2014, its Nationally Determined Contributions (NDC) in September 2015, and its First Biennial Update Report (FBUR) in November 2017.

2. UN Convention to Combat Desertification (Ratified: 21 October 1996)

Documents prepared in the context of the UNCCD include:

The Aligned National Action Plan to Combat Desertification in Jordan 2015- 2020

Final Country Report of the Land Degradation Neutrality Target Setting Programme in 2018.

3. UN Convention on Biological Diversity (Ratified: 10 February 1994)

Jordan submitted its Second National Biodiversity and Action Plan 2015-2020 in 2015.

These MEAs impose requirements and restrictions of varying degrees upon the member countries, in order to meet the objectives of these agreements. The implementation of Jordan's national policies, strategies and plans are contributions to the achievement of these global Conventions. Jordan is also committed to the Sustainable Development Goals (SDGs) principles, which are reflected in national vision and strategy, including the National Water Strategy 2016-2025. MWI will coordinate and lead the implementation of the water-related SDGs and targets in Jordan. Achieving the SDGs will lead to optimize the utilization of the resources that are interlinked (water, energy and food security).

5. FAO AND GCF SAFEGUARDS

In accordance with FAO and GCF ESS policy, the BRCCJ underwent an environmental and social assessment against FAO's environmental and social safeguards⁸⁹. FAO will not undertake activities in the non-eligible activities listed in Annex 1. There will be no significant or irreversible negative environmental impacts associated with the project – on the contrary, the project will build the adaptive capacity of communities and institutions in Jordan, address the needs of vulnerable groups with an emphasis on women, and

⁸⁹ FAO's Environmental and Social Management Guidelines available at: <http://www.fao.org/3/a-i4413e.pdf>

increase the resilience of water management systems as well as agricultural resources to climate change. Project components were identified through a consultative process, and are prioritized in Jordan's National Adaptation Plan (NAP). These are: water use efficiency, water harvesting and the use of non-conventional water sources, building adaptive capacity of farming households, economic diversification to assist in reducing poverty in the face of enhanced risks and generating employment in the long run. Promoting gender equality and empowering women is considered an important element of climate change adaptation in the NAP. As such, gender is heavily mainstreamed in project interventions.

5.1 RISK CLASSIFICATION OF THE PROPOSAL

According to FAO's environmental and social risk classification, the project is moderate risk (Category B). Moderate risk projects are defined as:

- a) Projects with environmental and/or social impacts potentially identified.
 - Project activities involve the installation of rooftop rainwater harvesting structures and water saving devices for households (HH) and public buildings. These activities aim to build climate resilience through improved access to water and efficient water use at the household level and in selected public buildings such as schools, mosques, municipalities for wider dissemination and awareness of the technology at the local community level. Any potential impacts would be linked to the construction of water harvesting structures, but these are localized and can be mitigated.
 - Regulation, storage and distribution of hydraulic structures will be built to maximize use of reclaimed water from the Wastewater Treatment Plants (WWTP) in three Governorates. This will enhance climate resilience at the farm level by providing additional water for agriculture, and will reduce the impacts of wastewater treatment effluents on the ecosystem. Any potential impacts would be linked to the construction of storage and distribution infrastructure, but these are localized and can be mitigated. This infrastructure will connect farmers and farms to water from the WWTPs for irrigation of crops that are not directly used for human consumption, therefore, fodder crops and trees such as olives for olive oil.
- b) Potential impacts are limited to the project footprint.
 - In case of verifying some of the potential identified impacts, these will happen within the project intervention area. For example, there are no downstream-related impacts envisaged with regards to reclaimed (from non-industrial sources) water, as there is no water extraction involved.
- c) Potential impacts are neither irreversible nor cumulative.
 - Potential impacts are reversible and not cumulative, as they involve localized interventions, with wide-ranging adaptation benefits.
- d) Potential negative impacts can be resolved by means of best practice (e.g. managing construction pollution, materials used, safety measures, using FFS together with women and men farmers).
 - These will be addressed through mitigation measures (e.g. ensuring stakeholder engagement, following best practice, obtaining necessary technical clearances, where and if needed).

The ESMF identifies policy triggers for the project, screening criteria for activities, environmental and social impacts of the activities, and measures to mitigate identified risks. Mitigation actions will avoid, minimize and mitigate negative impacts during project implementation and operation. Mitigation actions will be in line with FAO and GCF ESS policy, and national legislation, and adhere to whichever is most

stringent. The ESMF also sets out the modalities for stakeholder engagement, and the procedure and process for dealing with complaints, through the Grievance Redress Mechanism.

The ESMF will be disclosed on relevant portals, and shared with stakeholders during stakeholder engagement consultations, so they will be aware of potential consequences of project activities. Consultations with stakeholders during project implementation will take place yearly, at the time of the preparation of Annual Work Plan and Budgets (AWPB). The AWPB will be presented by the PMU and reviewed by all stakeholders, including at the national, Governorates, Municipality, and community levels. During these stakeholder consultations, the Grievance Redress Mechanism will also be presented and explained, and to ensure its efficacy, based on the previous years' experience, will be evaluated and refined, if and as needed

In order to ensure a smooth and effective ESMF process, there will be one person in the PMU responsible for the environmental and social safeguards process (including GRM and stakeholder engagement).

Proposed project investments are designed to have positive social and environmental benefits; the project has however been classified as moderate risk (Category B) largely due to works associated with water resources. FAO ESS triggered are:

ESS 1 (natural resources management). Risks are related to the installation of rooftop rainwater harvesting structures and water saving devices for households (HH) and public buildings; and regulation, storage and distribution of hydraulic structures built to maximize use of reclaimed water from the Wastewater Treatment Plants. Jordanian legal frameworks, and international standards (e.g. WHO guidelines) on these issues will be followed, as applicable. Best practice for optimal rainwater harvesting, including materials (e.g. for catchment area, conveyance systems, storage tanks, first flush) will be implemented; all leftover construction material will be disposed of at an appropriate site.

ESS 3 (plant genetic resources for food and agriculture). Drought-tolerant and water efficient seed varieties will be used, such as cultivars of barley and fruits. These varieties are old varieties and have been tested and patented by NARC, under the MoA. If and as applicable, internal FAO clearance will be sought for all procurement of seeds and planting materials. The project will use the Farmer Field School (FFS) approach.

ESS 7 (decent work). Potential risks could be related to equitable benefitting from project activities. To address this, project activities specifically target women and also youth (ref. Gender Action Plan). Occupational health and safety risks will be dealt with by providing training, and protective measures and gear. Where the project hires workers, employees' rights as per UN/FAO standards will be respected. The employment of project workers will be based on the principle of equal opportunity and fair treatment, and there will be no discrimination with respect to any aspects of the employment relationship

5.2 FAO ENVIRONMENTAL AND SOCIAL SAFEGUARDS (ESS)

Table 6 (below) lists the FAO Safeguards that are applicable for BRCCJ and gives a description of why ("justification" of applicability).

Table 6. FAO Applicable Safeguards.

FAO Safeguard	Applies	Justification
ESS1: Natural Resource Management	Yes	This Safeguard was triggered because of water related activities. Water harvesting structures will be built at the household level, and on public buildings. Irrigation schemes will be improved. The project provides supplemental water to existing irrigation schemes, whose size is likely to be equal or slightly greater than 20 hectares. Irrigation schemes may possibly be expanded., but this will <i>not</i> involve fresh or groundwater extraction; interventions are linked only to reclaimed water. The project will use wastewater: a priority of GoJ, activities are in line with national standards. Wastewater for agricultural purposes, however, will not be taken from industrial sources, and will be used on non-direct consumption crops (i.e. fodder and tree crops).
ESS2: Biodiversity, Ecosystems and Natural Habitats	No	Not applicable. Biodiversity, ecosystems and natural habitats will not be impacted by the project.
ESS3: Plant Genetic Resources for Food and Agriculture	Yes	Seed will be provided; these are drought-resistant crop varieties that have historically been present in Jordan but are now in disuse. They have since been tested through NARC research, and patented (MOA).
ESS4: Animal - Livestock and Aquatic - Genetic Resources for Food and Agriculture	No	Not applicable. Animal and aquatic genetic resources are not targeted by the project, and the project will impact on them.
ESS5: Pest and Pesticide Management	No	The project will not lead to increased use of pesticides through intensification or expansion of production. Should, however, this occur, the project already works through FFS, and IPM practices would be promoted.
ESS6: Involuntary Resettlement and Displacement	No	Not applicable. There will be no involuntary resettlement nor displacement.
ESS7: Decent Work	Yes	The project operates in target areas with high incidences of poverty – these persons are project beneficiaries. It also operates in situations where major gender inequality in the labour market prevails; inclusion of women (and also youth) is a major project aspect and the Gender Action Plan addresses this. Workers will be employed - in line with national legislation and/or UN/FAO regulation, whichever is most stringent. Training will be provided on operations, and Operational Hazards and Safety Risks.
ESS8: Gender Equality	No	Gender equity will be addressed in project design/activities and the Gender Action Plan.
ESS9: Indigenous Peoples and Cultural Heritage	No	Not applicable. This was confirmed by FAO's Indigenous Peoples unit who informed that it is unlikely that the target governorates host indigenous peoples; It is considered that the project

FAO Safeguard	Applies	Justification
		activities will not affect indigenous peoples. Prior to implementing field level activities, a review will be undertaken to confirm that. Should it be found that indigenous peoples are affected, the process of Free, Prior and Informed Consent will be applied.

5.3 GREEN CLIMATE FUND SAFEGUARDS

GCF has provisionally adopted the Performance Standards (PS) and directives of implementation of the International Financial Corporation, for the purposes of safeguarding GCF projects. There are eight IFC Performance Standards that include the main environmental and social questions that must be considered when starting a project, using the best international practices. This project has been screened against FAO environmental and social standards, ensuring that the project is consistent with the objectives of GCF Performance Standards. Table 7 (below) lists, and aligns, them against the (nine) FAO Standards.

Table 7. Green Climate Fund Safeguards.

IFC - Performance Standards	FAO Standards
PS 1: Assessment and Management of environmental and social risks and impacts	ESS 1: Natural Resource Management ESS 8: Gender Equality
PS 2: Labor and Working conditions	ESS 7: Decent Work
PS 3: Resource efficiency and pollution prevention	ESS 5: Pests and pesticides management
PS 4: Community health, safety and security	ESS 7: Decent Work (partially)
PS 5: Land acquisition and involuntary resettlement	ESS 6: Involuntary Resettlement and Displacement
PS 6: Biodiversity conservation and sustainable management of living natural resources	ESS 2: Biodiversity, Ecosystems and Natural Habitats ESS 3: Plant genetic resources for food and agriculture ESS 4: Animal - Livestock and Aquatic - Genetic Resources for Food and Agriculture
PS 7: Indigenous Peoples	ESS 9: Indigenous Peoples and Cultural Heritage
PS 8: Cultural Heritage	

The most stringent policy and/or law will be followed in any instances of discrepancy between national legislation and GCF/FAO requirements. In practice, this means that the project will follow national policy and/or law to the extent that it is applicable/relevant, while ensuring that supplementary actions and/or measures are taken in the event that the application of the relevant national policy and/or law is not sufficient to adhere to GCF/FAO requirements. In so doing, the project will ensure that the most stringent standards are consistently adhered to, while still applying (and building directly on) the relevant national policies and/or laws.

6. STAKEHOLDER ENGAGEMENT

The BRCCJ was designed in close consultation with and involvement of relevant government agencies, technical line departments and communities in the project area. This has ensured that the components and activities proposed are in line with national policies and strategies with strong country ownership and relevance for local communities. More information on the BRCCJ stakeholder engagement process is provided in a separate Annex (Annex 7), to the FFP.

6.1 STAKEHOLDER IDENTIFICATION

Stakeholders were initially identified through discussions between the Nationally Designated Authority (NDA) and FAO, during the design of the preliminary project concept. These discussions identified the ministries, departments, and line agencies that would likely be involved.

This project was also subject to a broad consultation process from its inception, from the top management levels to local communities. Among the tasks of the consultation process was the mapping of entities and other stakeholders for project implementation, including management and technical leadership. Stakeholder were also identified for the implementation of project components. Below is a table outlining the key stakeholders, and their roles/responsibilities within the project.

Table 8. Key stakeholders and roles/responsibilities.

KEY STAKEHOLDERS	ROLES/RESPONSIBILITIES
Food and Agriculture Organization of the UN (FAO)	Accredited Entity (AE) and overall Executing Entity (EE).
FAO Jordan	Project Budget Holder (BH) and responsible for overall project delivery and reporting.
United Nations Development Programme (UNDP)	Together with FAO, UNDP responsibility for implementing part of the activities under Component 1, as an Executing Entity (EE). Component 1: <ul style="list-style-type: none"> • Rooftop water harvesting • Landscape Resilience Investment Plan
Ministry of Agriculture (MOA)	Component 2: <ul style="list-style-type: none"> • Farmer Field Schools and Field Days • E-Extension for Climate Adaptation
Ministry of the Environment (MOE)	National Designated Authority (NDA). Host the Project Management Unit (PMU). Component 1: <ul style="list-style-type: none"> • Maximize use of reclaimed water Component 2: <ul style="list-style-type: none"> • Farmer Field Schools and Field Days Component 3: <ul style="list-style-type: none"> • Incorporation of Adaptation in Educational Curriculum
National Climate Change Committee (NCCC)	Component 3: <ul style="list-style-type: none"> • Policy and Regulatory frameworks

Technical Working Group (TWG) on Adaptation	Component 3: <ul style="list-style-type: none"> • Policy and Regulatory frameworks
Ministry of Water and Irrigation (MWI)	Component 1: <ul style="list-style-type: none"> • Roof Top Water Harvesting in Public Buildings • Roof Top Water Harvesting (Household Level) • Maximize use of reclaimed water • Landscape Resilience Investment Plan
Jordan Valley Authority (JVA)	In Jordan, responsible for the socio-economic development of the Jordan Valley, primarily managing bulk water supply for irrigation, domestic, and industrial purposes, as well as promoting land development.
Water Authority of Jordan (WAJ)	In Jordan, responsible for planning, construction, operation and maintenance of the public water supply and sewer services either directly or indirectly through its subsidiaries.
Water Demand Management Unit (WDMU)	In Jordan, leads programs of Water Demand Management at the Municipal Sector.
Ministry of Health (MOH)	Component 1: <ul style="list-style-type: none"> • Maximize use of reclaimed water
National Agricultural Research Center (NARC)	Component 2: <ul style="list-style-type: none"> • Farmer Field Schools and Field Days • E-Extension for Climate Adaptation
Local communities	Component 1: <ul style="list-style-type: none"> • Landscape Resilience Investment Plan
TA	Component 2: <ul style="list-style-type: none"> • Farmer Field Schools and Field Days • E-Extension for Climate Adaptation • Women Change Agents for Climate Adaptation
Private sector	Component 1: <ul style="list-style-type: none"> • Roof Top Water Harvesting in Public Buildings • Roof Top Water Harvesting (Household Level) • Maximize use of reclaimed water
NGOs	Component 1: <ul style="list-style-type: none"> • Roof Top Water Harvesting in Public Buildings • Roof Top Water Harvesting (Household Level) Component 2: <ul style="list-style-type: none"> • Women Change Agents for Climate Adaptation
Civil Society Organizations (CSOs)	Component 1:

	<ul style="list-style-type: none"> • Maximize use of reclaimed water
Jordan University of Science and Technology (JUST)	Component 2: <ul style="list-style-type: none"> • Women Change Agents for Climate Adaptation
Educational and Vocational Institutions	Component 3: <ul style="list-style-type: none"> • Incorporation of Adaptation in Educational Curriculum
Service Providers (SP)	Component 3: <ul style="list-style-type: none"> • Policy and Regulatory frameworks • Incorporation of Adaptation in Educational Curriculum • Citizen Engagement • Local Administration, Private sector and Civil Society Engagement

6.2 STAKEHOLDER ENGAGEMENT PROCESS

6.2.1 Stakeholder engagement during project formulation.

The BRCCJ was developed and prepared following a request to FAO, by the Government of Jordan. The process began in 2017, and through consultations with stakeholders, was refined to what is now the Full Funding Proposal (FFP).

Stakeholder engagement is viewed as crucial in order to develop a strong project and high level of country ownership. The BRCCJ proposal was developed in consultation with stakeholders to ensure that the project design is appropriate and meets national priorities and local needs, and to identify activity priority areas and gaps, project target areas, main stakeholders, and implementation arrangements/responsibilities. Furthermore, consultations were held to verify the technical feasibility of the activities included in the project components, and to obtain feedback from stakeholders on all aspects of the project.

Other issues that were discussed included the climate rationale, the relevant climate change adaptation targets, the proposed project approach including the investment criteria, the sustainability and the expected paradigm shift. Stakeholders agreed on needs to be addressed, targets, methodology, timeframe and budget.

At the time the project was first conceived, a range of activities were put forward, and project areas were not concretely identified. During the course of project elaboration, key stakeholders, local communities and government agencies dealing with the water and agriculture sectors in Jordan were consulted in workshops, detailed meetings and field visits. These included consultations with the Ministry of Environment, the Ministry of Water and Irrigation (MWI), the Ministry of Agriculture (MoA), the National Agriculture Research Centre (NARC), the Jordan Valley Authority (JVA), Water Authority of Jordan, UNDP, IUCN, GIZ, USAID, the Jordan River Foundation, the Jordanian Hashemite Fund for Human Development (JoHUD), and UN Women, among others. Members of local farming communities were also consulted to better understand the impact of climate change on their livelihoods and further assess the relevance, potential impact and sustainability of the measures proposed. During project formulation missions, “non-structured” bilateral meetings were also held on both technical and project management/implementation

issues. Workshops were held to elaborate and validate project priorities, ensure their alignment with GCF priorities, and ultimately define project activities and areas.

During workshops, feedback was received on national priorities including gender equality and empowering women, MOA research with regards to drought-tolerant seeds, and the use of treated wastewater from existing wastewater treatment plants. The range of the project area was considered an issue to be discussed; the project area was then scaled down from three to one site (Dead Sea Basin). Other key risks and impacts identified concerned streamlining activities with national priorities, in particular the Jordanian National Adaptation Plan. It was decided that the focus of activities would be only on adaptation, and this was reflected in the design of project components and activities. With regards to the construction and rehabilitation of water springs and water ponds – while these were included in the initial proposal, following consultations, it was decided to omit these activities because of risks related to the lack of information about their dimensioning, feasibility and impact on surrounding environments and communities. As a precondition for including water infrastructure activities, the MWI provided additional technical information in order to further analyse water infrastructure activities and ensure compliance with FAO and GCF safeguards. Such information was received and project activities reflect this feedback. As project preparation evolved to include this feedback, revised activities were presented at meetings, for validation.

Consultations and workshops were held on:

1. “Stakeholders’ Brainstorming Session Towards developing Jordan proposal to the Green Climate Fund (GCF)” (14 August 2017).
2. “Validation Workshop Towards developing Jordan proposal to the Green Climate Fund (GCF)” (12 September 2017).
3. “Validation of Nationally Determined Contributions: Adaptation Measures under Agriculture, Food Security and Water” (16 July 2018).
4. “Building Resilience to Cope with Climate Change in Jordan using the Water-Agriculture-Energy Nexus Approach” (13 February 2019).
5. “Building resilience to cope with climate change in Jordan through improving water use efficiency in the agriculture sector” (8 January 2020).

At the local level, stakeholder engagement was ensured through consultations and bilateral meetings. Since 2017, several missions were undertaken by FAO to project areas. The missions visited the potential sites for water infrastructure, met local extension staff, visited NARC research centers, and waste water treatment plants, etc. The missions also met members of local farming communities to better understand the impact of climate change on their livelihoods and further assess the relevance, potential impact and sustainability of the measures proposed.

Lastly, key expert interviews were held for the preparation of the Gender Assessment and Gender Action Plan. This involved consultations with different agencies (e.g. Ministry of Agriculture, Department of Statistics, Jordanian Hashemite Fund for Human Development (JOHUD), the International Union for Conservation of Nature (IUCN) and the Jordan River Foundation (JRF), among others. In order to assess the needs of women in the targeted communities, a number of focus group discussions were also held, reaching out to both women and men, but the vast majority of participants were women.

6.2.2 Stakeholder engagement during project implementation.

Consultation at all levels during implementation is a good practice to assume in order to ensure that potential negative impacts and concerns are adequately addressed during the construction and operation of the project. Stakeholders will be engaged in project implementation throughout the duration of the entire project. An extensive consultation with the involved populations is required when the sub-activities could include impacts that would affect the natural resources that sustain the agricultural production of the local population, the generation of income and the livelihoods of the people. Consultations with stakeholders during project implementation will therefore take place yearly, at the time of the preparation of Annual Work Plan and Budget (AWPB) – i.e. at the beginning of each of the eight project Fiscal Years (FY). The AWPB constitutes the main formal instrument to ensure ownership and participation of stakeholders and beneficiaries. It represents the results of the national engagement process and the main planning tool of the project. To this end the PMU, via its M&E unit and partners, will secure constant dialogue with target communities and administrations and will ensure their participation in the AWPB formulation process. The AWPB will be presented by the PMU and reviewed by all stakeholders, including at the national, Governorates, Municipality, and community levels. During these stakeholder engagement consultations, the ESMF – including the Grievance Redress Mechanism (GRM), but also the Gender Action Plan (GAP) - will be shared with stakeholders, and explained. To ensure the efficacy of the GRM, based on the previous years' experience, the GRM will be evaluated and refined at these times, if and as needed. Details of stakeholder engagement are available in Annex 7 to the FFP.

6.2.3 Public consultation results.

Final consultations with regards to the validation of the ESMF are still pending. The ESMF – including the Grievance Redress Mechanism (GRM) and the Gender Action Plan (GAP) - will be shared with and explained to stakeholders, for their feedback and validation. This will take place as part of the stakeholder engagement process, throughout project implementation.

6.3 DISCLOSURE

According to GCF and FAO policies on access to information, all safeguard instruments under this project, including the ESMF and Gender Action Plan must be disclosed online in the English and local language (Arabic, in the case of Jordan) at least 30 days prior to GCF Board meeting and approval of the project. Access to the documents must be possible for any locals (i.e. it must be disclosed locally in an accessible place) in a form and language understandable to key stakeholders. Such disclosure of relevant project information helps stakeholders effectively participate. FAO is committed to disclosing information in a timely manner and in a way that is accessible and culturally appropriate, placing due attention to the specific needs of community groups which may be affected by project implementation (e.g. literacy, gender, differences in language or accessibility of technical information or connectivity).

For moderate risk projects like this one, FAO releases the applicable information as early as possible, and no later than 30 days prior to project approval. The 30-day period commences only when all relevant information requested from the project has been provided and is available to the public. FAO undertakes disclosure for all moderate risk projects, using a disclosure portal to publicly disclose all of the projects' documentation related to environmental and social safeguards (e.g. Environmental and Social Management Frameworks, Gender Action Plans, Indigenous Peoples Plans, and other relevant documents, as applicable). The website is: <http://www.fao.org/environmental-social-standards/disclosure-portal/en/>.

In order to ensure the widest dissemination and disclosure of project information, including any details related to applicable environmental and social safeguards, local and accessible disclosure tools including audiovisual materials (e.g. flyers, brochures, community radio broadcasts) will be utilized in addition to the standard portal disclosure tool. Furthermore, particular attention will be paid to farmers, indigenous peoples, illiterate or technological illiterate people, people with hearing or visual disabilities, those with limited or no access to internet and other groups with special needs. The dissemination of information among these groups will be carried out with the project counterparts and relevant local actors.

In relation to each Category B sub-activity to be funded under the Project, FAO shall disclose fit-for-purpose environmental and social impact assessment, the Environmental and Social Management Plan (ESMP), and as appropriate any other associated information required to be disclosed in accordance with the GCF Information Disclosure Policy (Project Disclosure Package). FAO shall disclose the sub-activity safeguards information at least 30 calendar days prior to commencing execution of any sub-activities that have been categorized as Category B, in English and in the local language (if not English), on its website and in locations convenient to affected peoples, and provide the Project Disclosure Package to the GCF Secretariat for further distribution to the Board and Active Observers and for posting on the GCF website. Within 180 days of the GCF Board approval of the Project, FAO and the GCF Secretariat shall agree on a process to enable communication of any comments to FAO, including from the GCF Board members and Active Observers, on Category B sub-activities relating to the Project Disclosure Package, and to take account of such comments in the finalization of such documents.

The above ESMF and the accompanying Gender Action Plan will be disclosed in English and Arabic (national language of Jordan) on appropriate websites. Both documents will also be disclosed at the Governorate level in Arabic, prior to project implementation.

6.4 GRIEVANCE REDRESS MECHANISM

In line with the GCF's Independent Redress Mechanism⁹⁰, FAO is committed to ensuring that its programs are implemented in accordance with its environmental and social obligations. In order to better achieve these goals, and to ensure that beneficiaries of FAO programs have access to an effective and timely mechanism to address their concerns about non-compliance with these obligations, the Organization, in order to supplement measures for receiving, reviewing and acting as appropriate on these concerns at the program management level, has entrusted the Office of the Inspector-General with the mandate to independently review the complaints that cannot be resolved at that level.

FAO will facilitate the resolution of concerns of beneficiaries of FAO programs regarding alleged or potential violations of FAO's social and environmental commitments. For this purpose, concerns may be communicated in accordance with the eligibility criteria of the Guidelines for Compliance Reviews Following Complaints Related to the Organization's Environmental and Social Standards⁹¹, which applies to all FAO programs and projects (Guidelines for Compliance Reviews Following Complaints Related to the Organization's Environmental and Social Standards).

Concerns must be addressed at the closest appropriate level, i.e. at the programme management/technical level, and if necessary, at the Regional Office level. If a concern or grievance cannot be resolved through consultations and measures at the project management level, a complaint requesting a Compliance Review may be filed with the Office of the Inspector-General (OIG) in accordance

⁹⁰ Available online at: <https://www.greenclimate.fund/sites/default/files/document/procedures-guidelines-irm.pdf>

⁹¹ Available online at: <http://www.fao.org/3/a-i4439e.pdf>

with the Guidelines. Program and project managers will have the responsibility to address concerns brought to the attention of the focal point.

Project-level grievance mechanism

The project will establish a grievance mechanism at field level to file complaints. Contact information and information on the process to file a complaint will be disclosed in all meetings, workshops and other related events throughout the life of the project. In addition, it is expected that awareness raising material be distributed to include the necessary information regarding the contacts and the process for filing grievances.

The Project Management Unit (PMU) will be responsible for addressing incoming grievances regarding environmental and social standards; as part of the safeguards performance monitoring, the Project Coordinator of the PMU will be responsible for documenting and reporting on any grievances received and how they were addressed.

Grievance Redress Mechanism Structure:

1. The complainant files a complaint through one of the channels of the grievance mechanism, which will be set up (email address, telephone number(s), contact person or physical address) before project implementation.
2. This will be sent to the PMU, where the Safeguards Specialist, who also acts as the GRM Focal Person, will assess whether or not the complaint is eligible. *The confidentiality of the complaint must be ensured throughout the process.*
3. Eligible complaints will be addressed by the PMU Safeguards Specialist together with the Project Coordinator of the PMU. The Project Coordinator will be responsible for recording the grievance and how it has been addressed if a resolution was agreed upon.
4. If the situation is exceptionally complex, or the complainer does not accept the resolution, the complaint must be escalated to a higher level (FAO Jordan Representation), until a solution or acceptance is reached.
5. If the situation is still not resolved, the grievance will be escalated to the FAO Regional Office for Near East and North Africa.
6. If the situation is still not resolved, the grievance will be escalated to the FAO Office of the Inspector-General.
7. For every complaint received, written proof of receipt will be sent within seven (7) working days; afterwards, a resolution proposal will be made within ten (10) working days.
8. In compliance with the resolution, the person in charge of dealing with the complaint may interact with the complainant, or may call for interviews and meetings, to better understand the situation.
9. All complaints received, their response and resolutions, must be duly registered.

Internal process

1. Project Management Unit. The complaint can directly contact the PMU either in writing, or orally. At this level, received complaints will be registered, investigated and solved by the PMU.

2. FAO Representative. The assistance of the FAO Representative is requested if a resolution was not reached and agreed upon in level 1.

3. FAO Regional Office for Near East and North Africa. If necessary, the FAO Representative will request the advice of the Regional Office to resolve a grievance, or will transfer the resolution of the grievance entirely to the regional office, if the problem is highly complex.

4. Only on very specific situations or complex problems, the FAO Regional Representative will request the assistance on the FAO Inspector General who pursues its own procedures to resolve the problem.

Resolution

Upon acceptance a solution by the complainer, a document with the agreement should be signed, clearly indicating the terms of the resolution.

Level of Redress Mechanism	Details
PMU	Must respond within 7 working days. Contact details to be established before project implementation.
FAO representation	In consultation with PMU, must respond within 5 working days. Mr Alexis Bonte Al-Sha'b St. Amman, Jordan FAO-JO@fao.org Tel: +962-6-5562554 Fax: +962-6-5562553
Regional FAO Office for Near East and North Africa	Must respond within 5 working days in consultation with FAO's Representation. Mr Ould Ahmed FAO-RNE@fao.org Tel: +202 3331-6000 to 3331-6007 Fax: +202 3749-5981 or +202 3337-3419
Office of the Inspector General (OIG)	To report possible fraud and bad behavior by fax, confidential: (+39) 06 570 55550 By e-mail: Investigations-hotline@fao.org By confidential hotline: (+ 39) 06 570 52333

7. MITIGATION MEASURES AND APPROACH TO ENHANCE POSITIVE IMPACTS

7.1 EXPECTED PROJECT IMPACTS

Positive impacts.

Water scarcity is a major issue in Jordan, from both environmental and social perspectives. Drought will become exacerbated by climate changes, and institutions, and populations in target areas, are not

optimally equipped to deal with adapting to these changes. Positive impacts of the project largely outweigh any unintended negative ones. The project will build the adaptive capacity of communities and institutions in Jordan, address the needs of vulnerable groups with an emphasis on women, and increase the resilience of water management systems as well as agricultural resources to climate change. Positive impacts of the project will be efficient water use, more efficient and effective water harvesting and the use of non-conventional water sources, building adaptive capacity of farming households, economic diversification to assist in reducing poverty in the face of enhanced risks and generating employment in the long run. Rainwater harvesting (RWH) has long-term impacts on local water resources by reducing demands for surface and groundwater withdrawals, contributing to the recharge of aquifers, and preventing floods and soil erosion. Also, RWH protects the integrity of local water resources by reducing non-point source pollution. Advantages of including RWH in national water supply plans is that it offers an alternative and sustainable water source which saves water and energy; rainwater harvesting structures are relatively easy to maintain, and reduces water bill costs as the quality of rain water can be used as a primary source for specific uses. Rooftop RWH structures provide a source of water for areas that are otherwise poorly served. The installation of water savings devices can have significant water saving results of up to 30 percent. Greater storage and use of reclaimed wastewater (WW) is expected to generate ecological benefits by reducing the volume that is discharged to rivers, increase awareness of the water cycle and fostering an ethic of water conservation. With respect to ecosystem health, the reuse of treated WW decreases the use of scarce freshwater for irrigation, increasing water supply for aquatic ecosystems. It decreases unsafe use of WW for irrigation and contributes to decreased incidence of environmental pollution. Irrigation using treated WW can potentially reduce the need of fertilizer. The project is expected to achieve 3 percent to 3.5 percent reduction in groundwater overdraft and to contribute up to 4.5 percent to the water management goals in the National Water Strategy. Institutions and communities will be supported in the development and uptake of climate resilient water systems by developing climate resilient landscape investment plans. Climate smart agricultural practices will enable farmers, communities and water users – with a focus on women - to adapt to climate change. Irrigation technology, rainwater harvesting and soil management, domestic use of water, organization and management of the dissemination of key technologies, budgeting and business plan development are included in training activities.

Negative impacts. Potential negative impacts are mitigatable, and expected during the implementation/operation stages only. Environmental impacts are mainly related to construction works for rooftop RWH structures, and storage and distribution infrastructure for the reuse of reclaimed water from Waste Water Treatment Plants (WWTP). These impacts can be of physical nature (involving design and construction practices). Other potential impacts during construction works are related to Operational Health and Safety Risks (OHSR), and human health (e.g. construction material used). Examples of some social risks could be related to non-engagement of stakeholders, and exclusion of some farmers resulting from development of a strategy for subsidizing the use of drought-tolerant (locally climate-adapted) seeds. Pesticide use is not envisaged, and Indigenous Peoples are not present in the project area; both these are, however, accounted for in the ESS mitigation plan, below.

7.2 MITIGATION OF ENVIRONMENTAL AND SOCIAL IMPACTS

The BRCCJ is designed to have positive environmental and social outcomes. Major project interventions (e.g. enhancing water availability in light of climate-related risks, enhancing the capacity of households to deal with climate change, and mainstreaming of gender sensitive resilience tools and practices to adapt to water scarcity in the national policy, educational, administrative and social frameworks) will contribute to climate change adaptation by strengthening climate-adaptive measures in the project area. Project priority criteria were developed and agreed upon with stakeholders for each project component.

Women's inclusion is a significant aspect of the project, as can be seen in the project priority criteria, and project activities. The Gender Action Plan is a tool prepared to ensure gender objectives and targets are met. Some project activities could, however, create mainly localized, and unintended impacts.

Table 9 (below) identifies the main activities and potential issues that may emerge depending on the project activities – and then identifies actions that need to be ensured to happen, or mitigation measures to take - in order to *not* have negative consequences. All construction works will undergo an ESS assessment prior to activity commencement, and ESMPs will be prepared. ESMPs will also take into account the mitigation actions described in the table below.

Table 9. ESS mitigation plan: potential environmental and social impacts, and actions.

Activity	Potential risk	Actions (ensure avoidance of/mitigation of) to address potential impacts
Construction of rooftop rainwater harvesting system (RHS) in public buildings and in households.	Non-engagement of households.	<ul style="list-style-type: none"> - Criteria for household selection is followed, including: <ul style="list-style-type: none"> o Verify home ownership. o Priority given to female headed households. o Proof of involvement of women in positioning of outlets and consideration of people with disabilities where relevant. o Engagement with communities to raise awareness of benefits of RHS: proof of participation in orientation sessions on optimal water use.
	Inappropriate site selection	Site selection will follow criteria identified and agreed upon during project development phase: <ul style="list-style-type: none"> - For households, technical feasibility is based on roof size and land availability and lay-out. - For public buildings, technical feasibility is based on roof size and proximity to groundwater recharge sites. - Selected buildings are owned by public or civil society institutions in target areas with a clear public function. - Obtain formal agreements with the institution to use and allow the use to agreed third parties of the infrastructure to do trainings, orientation and awareness sessions on optimal water use.
	Deployment of inappropriate or ineffective construction methods and materials.	<ul style="list-style-type: none"> - Good practice in design to be observed, such as: <ul style="list-style-type: none"> o Tanks: Selection of tank material will be based on site, land availability and technical feasibility, and stringent criterion on emissions related to the material, to ensure that concrete tanks are only used if all other options (fiberglass, steel and ferrocement) are not suitable. o Roofs: Smoother, cleaner and more impervious roofing materials are preferred.

Activity	Potential risk	Actions (ensure avoidance of/mitigation of) to address potential impacts
		<p>Tiled roofs or roofs sheeted with corrugated mild steel etc. are preferable since they are the easiest to use and give the cleanest water.</p> <ul style="list-style-type: none"> ○ Drainpipes and roof surfaces should be constructed of chemically inert materials such as wood, plastic, aluminum, or fiberglass, in order to avoid adverse effects on water quality. ○ Leaf screens are installed. ○ Cisterns should be durable and watertight and close to the water supply and demand source. Maximum height location to avoid pumping cost and extract water by gravity will be selected. Cisterns will be built away from any contaminant source of septic tank. A clean and smooth interior is built. <p>- All concrete waste is to be collected, recycled if possible, and removed from the site for disposal at an appropriate disposal site.</p>
	Human health negatively impacted.	<ul style="list-style-type: none"> - Rainwater harvested from catchments surfaces along the ground, shall only be used for irrigation because the increased risk of contamination. Therefore, at the household level, beneficiaries will be trained on water management, including on the non-use of RWH water for drinking purposes. - Roofs that have lead materials should be prohibited because acidic rain may cause contamination for collected water from these roofs. - When building cisterns, joints must be sealed with non-toxic waterproof material. They should provide for a cover to prevent evaporation and mosquito breeding and algae growth from contact with sunlight. They should not present danger to users falling in or by the tank instability. - Cisterns should provide water of a quality commensurate with its intended use – water that is used for drinking requires particular care: <ul style="list-style-type: none"> ○ The tank should be covered to prevent entry of light, and sealed against intrusion by mosquitoes and small creatures. ○ The tank should be ventilated to prevent anaerobic decomposition of any matter that is washed in.

Activity	Potential risk	Actions (ensure avoidance of/mitigation of) to address potential impacts
	Once the RWH is constructed, it will be used improperly/inefficiently.	<ul style="list-style-type: none"> - Training and awareness programme provided on rain water harvesting, climate change adaptation, and RWH system maintenance. - Specific Operation and Maintenance (O&M) guidelines and schedule for beneficiaries will be developed by the project. - O&M of water harvesting in public building will be covered by the institutions receiving the system. This will be formalized via specific agreements that are included in the selection criteria. - National legislation and standards concerning the use of rainwater harvested from rooftops will be respected.
	Temporary pollution during construction.	<ul style="list-style-type: none"> - Soil removed through any excavation should be used as back filling or immediately removed from the project site. - Any excavated soil remaining temporarily on site should be placed in a proper location and covered. - Construction should be avoided during periods of anticipated rainfall to prevent any soil erosion. - All concrete waste is to be collected, recycled if possible, and removed from the site for disposal at an appropriate disposal site.
	Operational Health and Safety Risks (OHSR).	<ul style="list-style-type: none"> - Compliance with general rules and regulations on OHSR. - Ensure workers are equipped with protective gear (e.g. helmets, boots, gloves, masks, and earplugs). - Ensure the availability of first aid kit at work sites and necessary information on rescue during emergency. - Ensure workers are trained on OHSR risk prevention and management on site. - Make barrier around any excavation and install warning signs to prevent passers-by and animals from falling in.
	Unfair employment.	<ul style="list-style-type: none"> - Prohibit admission of children employees or underage workers to construction site by applying age verification before the employment of workers. Employment will be in line with national legislation and/or UN/FAO regulation, whichever is most stringent.
Building storage and distribution infrastructure to maximize reuse of	Inappropriate selection of WWTPs.	<ul style="list-style-type: none"> - Agreed criteria for WWTP selection will be followed: <ul style="list-style-type: none"> o Proximity to agricultural lands with the potential to use reclaimed water.

Activity	Potential risk	Actions (ensure avoidance of/mitigation of) to address potential impacts
reclaimed water from existing WWTPs.		<ul style="list-style-type: none"> ○ Systems in place to monitor water quality at the outlets. ○ Adherence to water quality indicators and respect of national laws ○ Availability and volume of surplus reclaimed water of at least 500 m³/day available for at least 3 months of the year ○ Existence of agreements between MWI and farmers to regulate reuse of reclaimed water ○ Formal agreement of the MWI and of the WAJ to assume the operation and maintenance costs during and after the project.
	Inappropriate use of wastewater.	<ul style="list-style-type: none"> - Before beginning project activities, ensure that activities are always in line with national policy/guidelines/standards (Jordanian Standard 893/2002). - Wastewater for agricultural purposes will not be taken from industrial sources, and will be used only on non-direct consumption ("raw") crops (i.e. fodder and tree crops). - Provide Technical Assistance to promote demand and safe reuse of reclaimed water, including building local capacity of farmers and Water User Associations.
	Water quality is below acceptable standards, posing public safety and health risks, especially regarding <i>E. coli</i> .	<ul style="list-style-type: none"> - As per Jordanian legislation, ensure that the Wastewater Treatment Plant Owner Party is compliant with reclaimed water quality standards according to its end use, and with monitoring responsibilities. - If more stringent than Jordanian legislation, the <i>WHO Guidelines for the safe use of wastewater, excreta and greywater: v. 2. Wastewater use in agriculture</i> will be applied⁹². - Wastewater for agricultural purposes will not be taken from industrial sources, and will be used on non-direct consumption crops (i.e. fodder and tree crops). - Provide Technical Assistance to MWI and Ministry of Health to assure compliance with environmental standards.
	Poorly designed irrigation infrastructure.	<ul style="list-style-type: none"> - Jordanian standards for irrigation engineering works will be followed.

⁹² <http://www.fao.org/land-water/water/water-management/wastewater/en/>

Activity	Potential risk	Actions (ensure avoidance of/mitigation of) to address potential impacts
	Poorly designed water storage tank construction works.	<ul style="list-style-type: none"> - Water storage structures must be designed and constructed so that wastewater cannot intersect any underlying seasonal water table. - Water storage structures must be designed and constructed so as not to be liable, as far as practicable, to inundation or damage from flood waters. - Water storage structures must be designed and constructed to ensure that the contents of the structure do not overflow (unless the overflow has been contemplated in the approved design and normal operation) into waters or onto land in a place from which they are reasonably likely to enter any waters. - Water storage structures must be constructed with an appropriate liner which achieves the required permeability criteria and minimizes leakage. - The prepared sub-grade must be proof-rolled to determine the presence of zones that may require sub-grade improvement. The sub-grade must be smooth and free of stones prior to geosynthetic liner placement. - Water storage tanks must be designed and constructed in accordance with appropriate leakage detection requirements.
Develop a Landscape Resilience Investment Plan for part of the Dead Sea Basin.	Landscape Resilience Investment Plan does not take into account environmental and social considerations.	<ul style="list-style-type: none"> - Environmental and social feasibility studies will be conducted.
Climate resilient production practices.	Seeds that are used do not conform to FAO ESS 3 (plant genetic resources for food and agriculture).	<ul style="list-style-type: none"> - Seeds are for locally drought-tolerant adapted crops have already been tested by NARC, and are patented (MOA). - These seeds originate from old varieties; no GMO is involved. - Obtain internal clearance from FAO AGPMG. - Ensure that the seeds free from pests and diseases according to agreed norms, especially the IPPC.
	An increased use of pesticides.	<ul style="list-style-type: none"> - An increased use of pesticides resulting from project activities is not foreseen. Should this however occur, the project works with farmers through FFS, where IPM or other ecological pest management approaches practices would be promoted.
Policy and regulatory bottlenecks are identified and reforms initiated; providing	Potential exclusion of some farmers.	<ul style="list-style-type: none"> - The project will support stakeholder consultations, including with farmers and farmers associations, to design adoption mechanisms that will avoid exclusion.

Activity	Potential risk	Actions (ensure avoidance of/mitigation of) to address potential impacts
assistance in the development of a strategy for subsidizing the use of drought-tolerant (locally climate-adapted) seeds.		
Entire project	Gender violence due to (perceived) gender empowerment.	- Issues related to gender equity are addressed in project design/activities and the Gender Assessment and Gender Action Plan. The GRM is established as the platform whereby grievances related to the project ESMF can be addressed.
	Review reveals that there are Indigenous Peoples are affected by project activities.	- It is considered unlikely that the target governorates host indigenous Peoples, however, once progress will be made with the project formulation and in any case before implementing field level activities, a review will be undertaken to confirm that. Following such review, should it be found that indigenous peoples are affected, the process of Free, Prior and Informed Consent will be applied.

8. PRINCIPLES AND PROCEDURES TO MITIGATE IMPACTS FOR IMPLEMENTATION

This chapter describes the process for ensuring that environmental and social concerns are adequately addressed through the institutional arrangements and procedures used by the project for managing the identification, preparation, approval, and implementation of sub-project activities.

This ESMF identifies the ESS policy triggers for the project, the potential environmental and social impacts of project activities, and measures to mitigate the identified risks. In the early stages of the project, once specific target activity areas have been identified, and activities fully defined, an environmental and social screening exercise will be carried out at the sub-project level (refer to Annex 3 for FAO's Environmental and Social Safeguards (ESS) checklist). This tool will help identify those sub-projects that may require mitigation measures. As an Executing Entity, UNDP is responsible for implementing activities related to (Component 1) roof-top water harvesting at the household level and the preparation of the Landscape Resilience Plans; UNDP will apply its Social and Environmental Screening procedures (SESP). Any Environmental Impact Assessments will be in line with national laws and guidelines and FAO's ESS. They will be shared with FAO for cohesion, integration and coordination with FAO's ESMF, including for monitoring and reporting on safeguards. This will also be addressed by the joint FAO/UNDP coordination committee that will review implementation progress.

In order to ensure that the environmental and social issues are addressed properly in accordance and in compliance with the FAO and GCF Policies, all project activities shall undergo screening, assessment, review, and clearance process before execution of the project activities. **In accordance with Jordan's**

Environmental Impact Assessment Regulation No. 37 of 2005, BRCCJ activities do not fall under Annex 2 or Annex 3 projects. This ESMF constitutes the initial environmental impact assessment as per Annex 1, and notes that BRCCJ project sub-activities will undertake, as applicable, further environmental and social impact assessments, where FAO and/or national environmental impact assessment standards/regulation will be followed, whichever is most stringent.

Table 10. BRCCJ's Compliance with Jordanian EIA Procedures and Steps.

Stage Activity	Jordanian EIA Procedures and Steps and Steps
Initial Screening	<ul style="list-style-type: none"> • The ESS Specialist of the BRCCJ PMU completes FAO's ESS Screening Checklist (provided in Annex 3) for the intended sub-project activity and submits it to FAO's Environmental and Social Management Unit (ESMU), for screening and endorsement. • The ESS Checklist determines the sub-project activity classification: <ul style="list-style-type: none"> ○ Category I (A) project; for which a full EIA/EMP report is required. ○ Category II (B) project, for which an initial EIA/EMP is required. ○ Category III (C) for which no environment analysis is required. <p>(Ref. Section 8.2, below)</p>
Environmental and Social Plans	<ul style="list-style-type: none"> • The ESS Specialist of the BRCCJ PMU prepares the Terms of Reference for the ESMP, based on Sections 8.2 and 8.3, below. • The ESS Specialist of the BRCCJ PMU, together with technical specialists, prepares and Environmental and Social Management Plan (ESMP). • FAO's ESMU and Jordan's MOE review and approve the ESMP. • The ESMPs are publicly disclosed, and presented and discussed during stakeholder consultations. <p>(Ref. Sections 8.2 and 8.3, below)</p>

8.1 DEFINING SUB-PROJECT ACTIVITIES

By design, the project is expected to have far greater environmental benefits than adverse environmental impacts. The potential adverse environmental impacts from the project are likely to be small and limited. However, it is recognized that such impacts can accrue into larger impacts if they are not identified early during the planning cycle and their mitigation measures integrated into the project planning and implementation.

Considering the activities to be implemented in each implementing site will be very similar in nature and scale across the implementation area, it is proposed that screening for potential risks is undertaken at sub-project activity level. Sub-project activities constitute a valid tool to identify expected impacts and mitigation and monitoring measures.

In this context, sub-project activities will be identified during the inception phase. For each sub-project activity, implementing sites will be identified along with activities, including capacity building/training and stakeholder engagement information specific to each site.

In order to ensure a smooth and effective ESMF process, there will be one person in the PMU responsible for the environmental and social safeguards (ESS) process (including GRM and stakeholder engagement).

8.2 ENVIRONMENTAL AND SOCIAL RISK SCREENING OF SUB-PROJECT ACTIVITIES

FAO's Environmental and Social Screening (ESS) checklist (Annex 3) will determine if an Environmental and Social Management Plan (ESMP) is needed for each sub-project activity. The nature, magnitude, reversibility, and location of impacts are main elements in the screening of sub-projects; expert judgment is a main factor in deciding whether an ESMP is required for a sub-project or not, and national EIA legislation must also be consulted.

For a sub-project activity that requires an ESMP, the proposal must include a set of mitigation measures with monitoring and institutional arrangements to be taken during the implementation phase to correctly manage any potential adverse environmental and social impacts that may have been identified.

FAO will undertake environmental and social screening following FAO's ESS Checklist. Once the implementation sites and beneficiaries are determined, a screening checklist will be completed per sub-project activity and signed off by the ESS specialist at the Project Management Unit (PMU). The results of the screening checklists will be aggregated by the ESS specialist. This document will be sent to the ESM unit in FAO for endorsement.

Screening of sub-project activities involves:

- a) checking the activity is permissible (as per the legal and regulatory requirements of the project); and
- b) determining the level of environmental assessment required based on the level of expected impacts.

The ESS screening checklist will result in the following screening outcomes:

- a) determine the category for further assessment; and
- b) determine which environmental assessment instrument to be applied.

Pre-implementation safeguards documents (one per sub activity) will be under the responsibility of the project Safeguards Specialist prior to the implementation of activities and sent to ESM Unit for endorsement.

The documents will outline the following information relative to each sub-project activity:

- a) Description of the activities to be carried out in all sites
- b) Description of each implementing site:
 - i. Geography and specificities in terms of activities
 - ii. Beneficiaries and stakeholders
 - iii. Map of the site
- c) Description of the stakeholder engagement process that was carried out in the inception phase and the stakeholder engagement plan to be carried during implementation.
- d) Break down of information by site about the grievance mechanism and disclosure.

e) Aggregated results of the environmental and social screening checklists per sub-activity signed off by the Safeguards Specialist in the Project Implementation Unit.

f) Where applicable, Environmental and Social Management Plans identifying mitigation measures, indicators, responsibilities and timeframe. The ESMP will be added to the monitoring plan to ensure safeguards performance is regularly reported upon along with stakeholder engagement monitoring per site.

8.3 ENVIRONMENTAL AND SOCIAL RISK MANAGEMENT

For a sub-project activity that requires an ESMP, the sub-project activity proposal must contain an ESMP consisting of a set of mitigation measures with monitoring and institutional arrangements to be taken during its implementation. Funds have been budgeted for the ESS Specialist, who is responsible for the overall preparation of this (see Annex 2).

The ESMP should include:

Mitigation Measures: Based on the environmental and social impacts identified from the checklist, the ESMP should describe with technical details each mitigation measure, together with designs, equipment descriptions and operating procedures as appropriate.

Monitoring: Environmental and social monitoring during the implementation of the sub-projects should be described, in order to measure the success of the mitigation measures. Specifically, the monitoring section of the ESMP provides:

- A specific description and technical details of monitoring measures that include the parameters to be measured, the methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions.
- Monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and to furnish information on the progress and results of mitigation, e.g. by annual audits and surveys to monitor overall effectiveness of this ESMP.

Institutional Arrangements: The ESMP should also provide a specific description of institutional arrangements, i.e. who is responsible for carrying out the mitigating and monitoring measures (for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting and staff training). Additionally, the ESMP should include an estimate of the costs of the measures and activities recommended so that the necessary funds can be budgeted and included in the proposal. The mitigation and monitoring measures recommended in the ESMP should be developed in consultation with all affected groups to incorporate their concerns and views in the design of the ESMP.

Once the pre-implementation documents with ESMPs are endorsed by the ESM Unit in FAO and Jordan's MOE, the Environmental and Social Safeguards Specialist from the PMU will ensure ESMPs are included and reported upon, along with stakeholder engagement in the context of the monitoring plan.

In this context, field staff will be responsible for monitoring the progress as relevant in the monitoring plan, as well as to identify any potential risks that may emerge through the implementation phase. This information will be compiled in progress reports and templates will include a section on Environmental and Social Risk Management, where the above information will be reported upon.

Information from progress reports will be received by the ESS specialist in the PMU, who will compile the information received in the progress reports, as well as that related to grievances to feed in a semi-annual report on Environmental and Social Safeguards Performance to be endorsed by the ESM Unit in FAO. This report will also include aspects of the Grievance Redress Mechanism to ensure its efficacy, and will be used in the preparation of the M&E Unit’s Annual Performance Reports (APR): based on the previous years’ experience, at AWPB meetings, the GRM will be evaluated and refined, if and as needed.

9. IMPLEMENTATION ARRANGEMENTS

Within the BRCCJ governance structure described in Section 2.4, above, the BRCCJ will have a project management structure (Project Management Unit, or PMU), within which the Environmental and Social Safeguards Specialist will work.

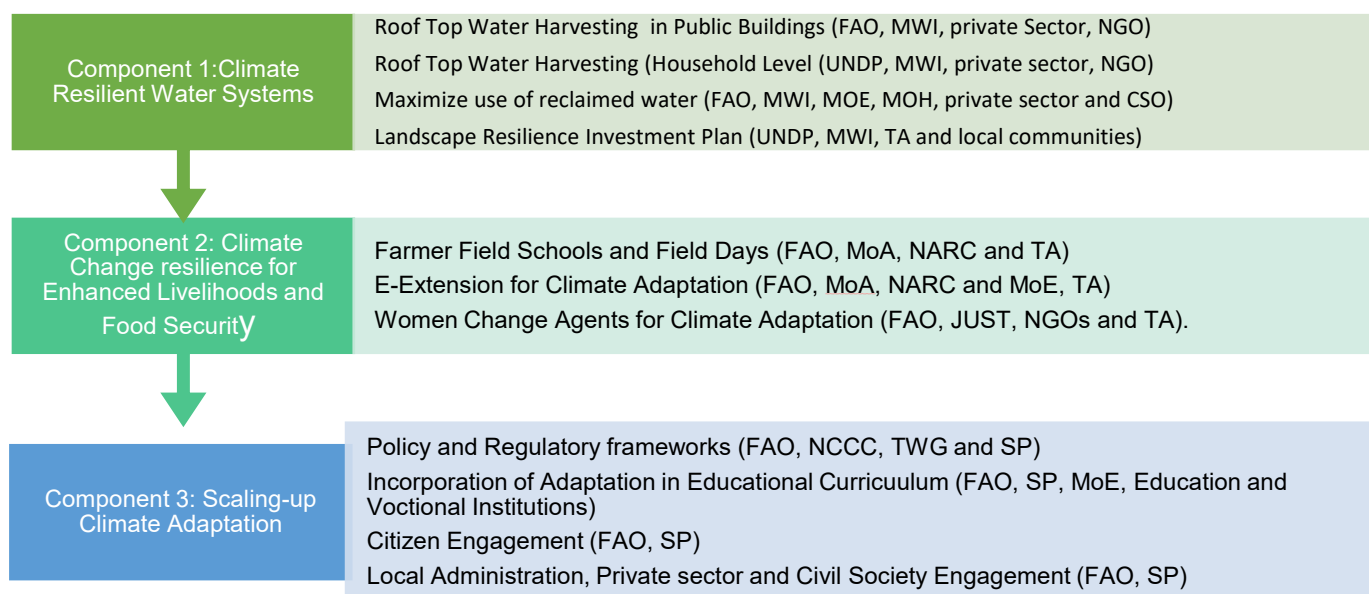
9.1 PROJECT MANAGEMENT AND IMPLEMENTATION

FAO will establish a Project Management Unit (PMU) within the Ministry of Environment. The PMU will be responsible for overall planning and coordination, developing annual work plans and budgets, day-to-day project management, provide technical backstopping, financial management and undertake procurement functions, project reporting and documentation. The PMU will be led by a Chief Technical Adviser (CTA) who will have overall responsibility for management and supervision of PMU staff and consultants on technical, administrative and operational aspects including procurement and financial management, Monitoring and Evaluation, and administrative and support staff. The CTA will be supported by focal points/liaison officers from the MoE, MWI and MOA who will ensure that Government agencies provide the key staff and support required.

Technical specialists such as an Irrigation Specialist/Hydrologist, a Training Specialist, Gender and Social Development Specialist and **Environmental and Social Safeguards Specialist** will support project the implementation of the various component activities. The project will use - selected under a competitive bidding process - private sector firms for construction, civil society organizations for liaising with communities and service providers for organizing events, capacity building and citizen engagement.

A review of the responsibilities assigned to different partners and service providers for each of the components and sub-components is given in Table 11, below. The ESS Specialist will work with these partners to ensure the implementation of this ESMF. As identified during the course of project implementation, this includes ESMP preparation and training on aspects of ESMP execution (e.g. stakeholder engagement, GRM, monitoring).

Table 11. Responsibilities for project components and sub-components.



9.2 ENVIRONMENTAL AND SOCIAL SAFEGUARDS MANAGEMENT

The BRCCJ project will ensure that this Environmental and Social Management Framework is adhered to, and its sections used as guidance for the preparation of Environmental and Social Management Plans (ESMPs), including monitoring and capacity building aspects. For this purpose, an Environmental and Social Safeguards (ESS) Specialist will be hired, within the PMU, for the duration of the project. The ESS Specialist is responsible for managing the ESMF implementation. A total budget of USD 175,000 has been allocated for the salary of this person. The ESS Specialist will be responsible for ensuring overall compliance with this ESMF, including presenting and explaining the ESMF (including grievance redress) to all stakeholders during consultations, and incorporate feedback into the project's implementation, and safeguards process. This includes ensuring that stakeholders have the capacity to implement ESMPs, and if not, provide training. The ESS Specialist will also support safeguard performance monitoring during the life of the project. This includes all aspects of environmental and social safeguards, grievance redress, stakeholder engagement, reporting, coordinating and supervising sub-activity screening and related ESMP preparation and execution. The ESS Specialist will be responsible for ensuring ESS screening for sub-activities prior to implementation, and will ensure that all ESMPs are cleared by FAO's ESMU and Jordan's MOE. The ESS Specialist will also be responsible for preparing the Terms of Reference of the ESMPs (using the guidance provided in Section 8, above), and the overall oversight of mitigation for any medium-risk activities using ESMPs developed during implementation, in collaboration with the entities involved in the implementation of those components (as outlined in Tables 8 and 11, above).

The ESS Specialist will receive support from the project's Gender and Social Development Specialist and Gender and Climate Change Adaptation (CCA) Specialist. The ESS Specialist will also work closely with the M&E unit, and the Gender and Social Development Specialist, on matters related to reporting for the environmental and social safeguards and stakeholder engagement aspects of the project.

A workplan describing the implementation of the commitments, and budget, are outlined in this Environmental and Social Management Framework and included in Annex 2.

Monitoring⁹³. The BRCCJ project will apply FAO's M&E standard procedures and will be compliant with the GCF performance measurement framework as reported in the Full Funding Proposal (FFP). FAO will manage and coordinate reporting to the GCF according to agreed standards and procedures. The project will follow an Evidence-Based Management (EBM) approach. The project's achievements towards approved targets will be monitored via identified indicators and against the project baseline as reported in the logframe matrix. The project cycle will be monitored using a combination of tools based on field data collection, georeferencing geospatial analysis. The M&E unit will be responsible for collecting data from identified service providers/ partners/authorities, and submitting progress reports on approved targets on a quarterly basis to the PMU manager. The M&E unit will ensure correct and efficient filing of collected GPS coordinates. Once coordinates will start populating the M&E database, activities will be shared by the PMU via thematic project's maps and will be monitored via consolidated remote sensing practices (geospatial analysis). This aspect of the process is paramount to ensure knowledge building within the PMU and among stakeholders and in evaluating direct and indirect impacts of project activities. Data, collected via reports prepared by service providers/partners and verified with beneficiaries, will be disaggregated by gender, among the others, and will be georeferenced. Functions of the M&E unit include verification and respect of the social and environmental safeguards. The ESS Specialist will work in close collaboration with the M&E unit to provide information for timely reporting on ESMF implementation, in the appropriate (M&E) format. Furthermore, in order to measure the success of the mitigation measures of ESMPs, environmental and social monitoring during the implementation of the sub-projects will be described in the ESMPs (this will be included in the Terms of Reference of the ESMP preparation; the budget is included within the project M&E). The information gathered through this will feed back into project M&E reporting (Section 8.3, above).

⁹³ Additional details on BRCCJ project monitoring and evaluation are available in Section 6 of Annex 2 (Feasibility Study), and Annex 11 (Monitoring and Evaluation Plans) of the FPP.

ANNEX 1. NON-ELIGIBILITY LIST

In order to avoid adverse irreversible impacts on the environment and people, the following activities are explicitly excluded from funding:

- a. Relocation and/or demolition of any permanent houses or business.
- b. Use of the project as an incentive and/or a tool to support and/or implement involuntary resettlement of local people and village consolidation.
- c. Land appropriation.
- d. Land acquisition using eminent domain without FAO-mandated consultation and agreement of the owner.
- e. New settlements or expansion of existing settlements.
- f. Damage or loss to cultural property, including sites having archeological (prehistoric), paleontological, historical, religious, cultural and unique natural values.
- g. Resources access restriction (e.g. restricted access to farming land) that could not be mitigated and will result in adverse impacts on the livelihoods of disadvantage peoples.
- h. Activities of any kind within natural habitats and existing or proposed protected areas.
- i. Purchase of banned pesticides, insecticides, herbicides and other unbanned pesticides, unbanned insecticides and unbanned herbicides and dangerous chemicals exceeding the amount required to treat efficiently the infected area.
- j. Unsustainable exploitation of natural resources.
- k. Introduction of non-native species, unless these are already present in the vicinity or known from similar settings to be non-invasive.
- l. Significant conversion or degradation of natural habitat or where the conservation and/or environmental gains do not clearly outweigh any potential losses.
- m. Labor and working conditions involving harmful, exploitative, involuntary or compulsory forms of labor, forced labor⁹⁴, child labor⁹⁵ or significant occupational health and safety issues.
- n. Trade in any products with businesses engaged in exploitative environmental or social behavior.
- o. Activities that will use or induce the use of hazardous materials (including asbestos) or any banned chemicals.

⁹⁴ Forced labour means all work or service, not voluntarily performed, that is extracted from an individual under threat of force or penalty.

⁹⁵ Harmful child labor means the employment of children that is economically exploitive, or is likely to be hazardous to, or to interfere with, the child's education, or to be harmful to the child's health, or physical, mental, spiritual, moral, or social development.

ANNEX 2: ESMF TIMELINE AND BUDGET

The Environmental and Social Safeguards (ESS) Specialist will be part of the PMU. S/he will be hired for the duration of the project, and will work in collaboration with/be supported by other project staff. (e.g. Gender Specialist, M&E Officer). The ESS Specialist will be responsible for ensuring the overall implementation of this ESMF, including: (i) conducting Environmental and Social Assessments using FAO's ESS Screening Checklist, and preparation of ESMPs for sub-project activities requiring them (in collaboration with technical experts such as the MoE technical advisor, water engineer specialist, agronomist and climate change adaptation (CCA) specialist, social inclusion and gender specialist, gender and CCA specialist, and relevant service providers); (ii) training PMU staff and relevant implementing agencies staff on the ESMF (including stakeholder engagement process and Grievance Redress Mechanism), with support from the Gender Specialist; (iii) ESMF validation: during stakeholder consultations, presenting, explaining to, and receiving feedback from stakeholders on the ESMF (including the Grievance Redress Mechanism) and incorporate, as needed, into the AWPB process; and (iv) as part of project M&E, and in collaboration with the PMU M&E Officer, preparing input on environmental and social safeguards aspects of the project for annual reporting, and for Mid-Term and Final evaluations.

Project costs of relevant staff.

Costs description	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	USD total costs
ESS safeguard specialist	25,000	25,000	25,000	25,000	25,000	25,000	25,000	175,000
Social Inclusion and Gender Specialist	25,000	25,000	25,000	25,000	25,000	25,000	25,000	175,000
Expert on Gender and Climate Change Adaptation Specialist	45,000	0	0	0	0	0	0	45,000
Allowances Gender and Climate Change Adaptation Specialist	10,800	0	0	0	0	0	0	10,800
Allowances of ES safeguard specialist and others	10,962	10,962	10,962	10,962	10,962	10,962	10,962	76,734
FAO technical assistance	0	20,000	20,000	20,000	20,000	20,000	0	100,000
FAO technical assistance to the PMU	10,714	10,714	10,714	10,714	10,714	10,714	10,714	75,000
TOTAL	127,476	91,676	91,676	91,676	91,676	91,676	71,676	657,534

Workplan and responsibilities.

ACTIVITY	INDICATOR	YEAR 1				YEAR 2				YEAR 3				YEAR 4				YEAR 5				YEAR 6				YEAR 7				RESPONSIBILITY
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
CAPACITY BUILDING																														
Targeted training for Safeguards Specialist ESS	Training provided																												FAD/ESSM Unit	
Capacity building of project staff/implementation partners on ESS	Training of PMU staff on ESS provided at AWPB meetings																												ESS Specialist	
ESS SCREENING AND ASSESSMENT																														
Identification of sub-project activities	List of sub-activities																												ESS Specialist/FAD/ESSM Unit	
ESS screening of sub-project activities	ESS Checklists																												ESS Specialist/FAD/ESSM Unit	
Environmental and Social Assessment and preparation of safeguards related documentation for compliance by sub-project activity	Pre-implementation documents per sub-project activity and ESMPs																												ESS Specialist/FAD/ESSM Unit	
STAKEHOLDER ENGAGEMENT-IMPLEMENTATION																														
Annual Work Plan and Budget (AWPB)	Approved AWPBs																												PMU/ESSC/J Steering Committee of Project/ESS Specialist	
Stakeholder consultations	Consultation reports																												PMU MLE Officer and Specialist/ESS Specialist/Gender Specialist/M	
GENDER ACTION PLAN																														
Mainstreaming gender in project interventions	Details in Gender Action Plan																												Gender Specialist/PMU MLE Specialist	
MONITORING AND REPORTING																														
Monitoring on ESS performance and stakeholder engagement, including Grievance Redress Mechanism	Project Progress reports																												PMU MLE Specialist/ESS Specialist/Gender Specialist/FAD/ESSM Unit	
Mid-Term and Terminal Review and Reporting	Mid-Term and Terminal Reports																												FAD/PMU/PMU MLE Unit/External Independent Auditor	
PROJECT MONITORING	Project Monitoring																												FAD/PMU/PMU MLE Unit/External Independent Auditor	

* Annual Work Plan and Budget

** Annual Performance Report

ANNEX 3. FAO ENVIRONMENTAL AND SOCIAL SCREENING CHECKLIST FORMAT USED TO DETERMINE RISK MITIGATION PLAN

Environmental and Social Risk Identification – Screening Checklist

Annex 1: Trigger questions

	Question	YES	NO
1	<p>Would this project:</p> <ul style="list-style-type: none"> • result in the degradation (biological or physical) of soils or undermine sustainable land management practices; or • include the development of a large irrigation scheme, dam construction, use of waste water or affect the quality of water; or • reduce the adaptive capacity to climate change or increase GHG emissions significantly; or • result in any changes to existing tenure rights⁹⁶ (formal and informal⁹⁷) of individuals, communities or others to land, fishery and forest resources? 		
2	<p>Would this project be executed in or around protected areas or natural habitats, decrease the biodiversity or alter the ecosystem functionality, use alien species, or use genetic resources?</p>		
3	<p>Would this project:</p> <ul style="list-style-type: none"> • Introduce crops and varieties previously not grown, and/or; • Provide seeds/planting material for cultivation, and/or; • Involve the importing or transfer of seeds and or planting material for cultivation <u>or</u> research and development; • Supply or use modern biotechnologies or their products in crop production, and/or • Establish or manage planted forests? 		
4	<p>Would this project introduce non-native or non-locally adapted species, breeds, genotypes or other genetic material to an area or production system, or modify in any way the surrounding habitat or production system used by existing genetic resources?</p>		
5	<p>Would this project:</p> <ul style="list-style-type: none"> • result in the direct or indirect procurement, supply or use of pesticides⁹⁸: <ul style="list-style-type: none"> ▪ on crops, livestock, aquaculture, forestry, household; or ▪ as seed/crop treatment in field or storage; or ▪ through input supply programmes including voucher schemes; or ▪ for small demonstration and research purposes; or ▪ for strategic stocks (locust) and emergencies; or ▪ causing adverse effects to health and/or environment; or 		

⁹⁶ Tenure rights are rights to own, use or benefit from natural resources such as land, water bodies or forests

⁹⁷ Socially or traditionally recognized tenure rights that are not defined in law may still be considered to be 'legitimate tenure rights'.

⁹⁸ Pesticide means any substance, or mixture of substances of chemical or biological ingredients intended for repelling, destroying or controlling any pest, or regulating plant growth.

	<ul style="list-style-type: none"> • result in an increased use of pesticides in the project area as a result of production intensification; or • result in the management or disposal of pesticide waste and pesticide contaminated materials; or • result in violations of the Code of Conduct? 		
6	Would this project permanently or temporarily remove people from their homes or means of production/livelihood or restrict their access to their means of livelihood?		
7	Would this project affect the current or future employment situation of the rural poor, and in particular the labour productivity, employability, labour conditions and rights at work of self-employed rural producers and other rural workers?		
8	Could this project risk overlooking existing gender inequalities in access to productive resources, goods, services, markets, decent employment and decision-making? For example, by not addressing existing discrimination against women and girls, or by not taking into account the different needs of men and women.		
9	<p>Would this project:</p> <ul style="list-style-type: none"> • have indigenous peoples* living outside the project area¹ where activities will take place; or • have indigenous peoples living in the project area where activities will take place; or • adversely or seriously affect on indigenous peoples' rights, lands, natural resources, territories, livelihoods, knowledge, social fabric, traditions, governance systems, and culture or heritage (physical² and non-physical or intangible³) inside and/or outside the project area; or • be located in an area where cultural resources exist? <p>* FAO considers the following criteria to identify indigenous peoples: priority in time with respect to occupation and use of a specific territory; the voluntary perpetuation of cultural distinctiveness (e.g. languages, laws and institutions); self-identification; an experience of subjugation, marginalization, dispossession, exclusion or discrimination (whether or not these conditions persist).</p> <p>¹The phrase "Outside the project area" should be read taking into consideration the likelihood of project activities to influence the livelihoods, land access and/or rights of Indigenous Peoples' irrespective of physical distance. In example: If an indigenous community is living 100 km away from a project area where fishing activities will affect the river yield which is also accessed by this community, then the user should answer "YES" to the question.</p> <p>²Physical defined as movable or immovable objects, sites, structures, group of structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic or other cultural significance located in urban or rural settings, ground, underground or underwater.</p> <p>³Non-physical or intangible defined as "the practices, representations, expressions, knowledge and skills as well as the instruments, objects, artifacts and cultural spaces associated therewith that communities, groups, and in some cases individuals, recognize as part of their spiritual and/or cultural heritage"</p>		

Annex 2: Second Level Questions

SAFEGUARD 1 NATURAL RESOURCES MANAGEMENT

Question	Management of soil and land resources	No	Yes	Comments
1.1	Would this project result in the degradation (biological or physical) of soils	LOW RISK	MODERATE RISK Demonstrate how the project applies and adheres to the principles of the World Soil Charter	
1.2	Would this project undermine sustainable land management practices?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	

	Management of water resources and small dams	No	Yes	Comments
1.3	Would this project develop an irrigation scheme that is more than 20 hectares or withdraws more than 1000 m3/day of water?	LOW RISK	MODERATE RISK Specify the following information: a) implementation of appropriate efficiency principles and options to enhance productivity, b) technically feasible water conservation measures, c) alternative water supplies, d) resource contamination mitigation or/and avoidance, e) potential impact on water users downstream, f) water use offsets and demand management options to maintain total demand for	

			<p>water resources within the available supply.</p> <p>g) The ICID-checklist will be included, as well as appropriate action within the project to mitigate identified potential negative impacts.</p> <p>h) Projects aiming at improving water efficiency <u>will carry out thorough water accounting</u> in order to avoid possible negative impacts such as waterlogging, salinity or reduction of water availability downstream.</p>	
1.4	Would this project develop an irrigation scheme that is more than 100 hectares or withdraws more than 5000 m3/day of water?	LOW RISK	<p>HIGH RISK</p> <p>A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.</p>	
1.5	Would this project aim at improving an irrigation scheme (without expansion)?	LOW RISK	<p>MODERATE RISK</p> <p>The ICID-checklist will be included, as well as appropriate action within the project to mitigate identified potential negative impacts.</p> <p>Projects aiming at improving water efficiency <u>will carry out thorough water accounting</u> in order to avoid possible negative impacts such as waterlogging, salinity or reduction of water availability downstream.</p>	

1.6	Would this project affect the quality of water either by the release of pollutants or by its use, thus affecting its characteristics (such as temperature, pH, DO, TSS or any other?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	
1.7	Would this project include the usage of wastewater?	LOW RISK	MODERATE RISK Demonstrate how the project applies and adheres to applicable national guidelines or, if not available, the WHO/FAO/UNEP Guidelines on Safe Usage of Waste Water in Agriculture	
1.8	Would this project involve the construction or financing of a dam that is more than 15 m. in height?	LOW RISK	CANNOT PROCEED	
1.9	Would this project involve the construction or financing of a dam that is more than 5 m. in height?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	

	Tenure	No	Yes	Comments
1.10	Would this project permanently or temporarily deny or restrict access to natural resources to which they have rights of access or use? Could this project result in any changes to existing <i>tenure rights</i> ¹ (<i>formal and informal</i> ²) of individuals, communities or others to land, fishery and forest resources?	LOW RISK	PROCEED TO NEXT Q	

	¹ Tenure rights are rights to own, use or benefit from natural resources such as land, water bodies or forests ² Socially or traditionally recognized tenure rights that are not defined in law may still be considered to be 'legitimate tenure rights'.				
	1.10.1	Could this project result in a negative change to existing legitimate tenure rights?	MODERATE RISK Demonstrate how the project applies and adheres to the principles/framework of the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT)	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	
	Climate		No	Yes	Comments
1.11	Could this project result in a reduction of the adaptive capacity to climate change for any stakeholders in the project area?		LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	
1.12	Could this project result in a reduction		LOW RISK	HIGH RISK	

	of resilience against extreme weather events?		A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	
1.13	Could this project result in a net increase of GHG emissions beyond those expected from increased production?	LOW RISK	PROCEED TO NEXT Q	
	1.13.1	Is the expected increase below the level specified by FAO guidance or national policy/law (whichever is more stringent)?	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	LOW RISK
	1.13.2	Is the expected increase above the level specified by FAO guidance or national policy/law (whichever is more stringent)?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.

SAFEGUARD 2 BIODIVERSITY, ECOSYSTEMS AND NATURAL HABITATS

	Protected areas, buffer zones or natural habitats	No	Yes
2.1	Would this project be implemented within a legally designated protected area or its buffer zone?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.

Biodiversity Conservation	No	Yes	Comments
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2.2	Would this project change a natural ecosystem to an agricultural/aquacultural/forestry production unit with a reduced diversity of flora and fauna?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	
2.3	Would this project increase the current impact on the surrounding environment for example by using more water, chemicals or machinery than previously?	LOW RISK	MODERATE RISK Demonstrate in the project document what measures will be taken to minimize adverse impacts on the environment and ensure that implementation of these measures is reported in the risk log during progress reports.	

	Use of alien species	No	Yes	Comments
2.4	Would this project use an alien species which has exhibited an invasive* behavior in the country or in other parts of the world or a species with unknown behavior? *An invasive alien species is defined by the Convention on Biological Diversity as “an alien species whose introduction and/or spread threaten biological diversity” (see https://www.cbd.int/invasive/terms.shtml).	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	

	Access and benefit sharing for genetic resources	No	Yes	Comments
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2.5	Would this project involve access to genetic resources for their utilization and/or access to traditional knowledge associated with genetic resources that is held by indigenous, local communities and/or farmers?	LOW RISK	<p>MODERATE RISK</p> <p>Ensure that the following issues are considered and appropriate action is taken. The issues identified and the action taken to address them must be included in the project document and reported on in progress reports.</p> <p>For plant genetic resources for food and agriculture (PGRFA) falling under the Multilateral System of Access and Benefit-sharing (MLS) of the International Treaty on Plant Genetic Resources for Food and Agriculture (Treaty), ensure that Standard Material Transfer Agreement (SMTA) has been signed and comply with SMTA provisions.</p> <p>For genetic resources, other than PGRFA falling under the MLS of the Treaty:</p> <ol style="list-style-type: none"> 1. Ensure that, subject to domestic access and benefit-sharing legislation or other regulatory requirements, prior informed consent has been granted by the country providing the genetic 	
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			<p>resources that is the country of origin of the resources or that has acquired the resources in accordance with the Convention on Biological Diversity, unless otherwise determined by that country; and</p> <p>2. Ensure that benefits arising from the utilization of the genetic resources as well as subsequent applications and commercialization are shared in a fair and equitable way with the country providing the genetic resources that is the country of origin of the resources or that has acquired the resources in accordance with the Convention on Biological Diversity; and</p> <p>3. Ensure that, in accordance with domestic law, prior informed consent or approval and involvements of indigenous and local communities is obtained for access to genetic resources where the indigenous and local communities have the</p>	
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			<p>established right to grant such resources; and</p> <p>4. Ensure that, in accordance with domestic legislation regarding the established rights of these indigenous and local communities over the genetic resources, are shared in a fair and equitable way with the communities concerned, based on mutually agreed terms.</p> <p>For traditional knowledge associated with genetic resources that is held by indigenous and local communities:</p> <p>1. Ensure, in accordance with applicable domestic law, that knowledge is accessed with the prior and informed consent or approval and involvement of these indigenous and local communities, and that mutually agreed terms have been established; and</p> <p>2. Ensure that, in accordance with domestic law, benefits arising from the utilization of traditional knowledge associated with genetic</p>	
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			<p>resources are shared, upon mutually agreed terms, in a fair and equitable way with indigenous and local communities holding such knowledge.</p> <p>Ensure that the project is aligned with the Elements to Facilitate Domestic Implementation of Access and Benefit Sharing for Different Subsectors of Genetic Resources for Food and Agriculture when it is the case</p>	
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SAFEGUARD 3 PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

	Introduce new crops and varieties	No	Yes	Comments
3.1	Would this project Introduce crops and varieties previously not grown?	LOW RISK	MODERATE RISK <ul style="list-style-type: none"> Follow appropriate phytosanitary protocols in accordance with IPPC Take measures to ensure that displaced varieties and/or crops, if any, are included in the national or international <i>ex situ</i> conservation programmes 	

	Provision of seeds and planting materials	No	Yes	Comments
3.2	Would this project provide seeds/planting material for cultivation?	LOW RISK	PROCEED TO NEXT Q	

	3.2.1	Would this project involve the importing or transfer of seeds and/or planting materials for cultivation?	LOW RISK	<p>MODERATE RISK</p> <ul style="list-style-type: none"> • Avoid undermining local seed & planting material production and supply systems through the use of seed voucher schemes, for instance • Ensure that the seeds and planting materials are from locally adapted crops and varieties that are accepted by farmers and consumers • Ensure that the seeds and planting materials are free from pests and diseases according to agreed norms, especially the IPPC • Internal clearance from AGPMG is required for all procurement of seeds and planting materials. Clearance from AGPMC is required for chemical treatment of seeds and planting materials • Clarify that the seed or planting material can be legally used in the country to which it is being imported • Clarify whether seed saving is permitted under the country's existing laws and/or regulations and advise the counterparts accordingly. • Ensure, according to applicable national laws and/or regulations, that farmers' rights to PGRFA and over associated traditional knowledge are respected in the access to PGRFA and the sharing of the benefits accruing from their use. Refer to ESS9: Indigenous peoples and cultural heritage. 	
	3.2.2	Would this project involve the importing or	LOW RISK	<p>MODERATE RISK</p> <p>Ensure compliance with Access and Benefit Sharing norms as stipulated in the International</p>	

		transfer of seeds and/or planting materials for research and development?		Treaty on Plant Genetic Resources for Food and Agriculture and the Nagoya Protocol of the Convention on Biodiversity as may be applicable. Refer also to ESS2: Biodiversity, Ecosystems and Natural Habitats.	
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	Modern biotechnologies and the deployment of their products in crop production	No	Yes	Comments
3.3	Would this project supply or use modern plant biotechnologies and their products?	LOW RISK	MODERATE RISK <ul style="list-style-type: none"> Adhere to the Cartagena Protocol on Biosafety of the Convention on Biological Diversity to ensure the safe handling, transport and use of Living Modified Organisms (LMOs) resulting from modern biotechnology that may have adverse effects on biological diversity, taking also into account risks to human health. Adhere to biosafety requirements in the handling of Genetically Modified Organisms (GMOs) or Living Modified Organisms (LMOs) according to national legislation or⁹⁹ Take measures to prevent gene flow from the introduced varieties to existing ones and/or wild relatives 	

	Planted forests	No	Yes	Comments
3.4	Would this project establish or manage planted forests?	LOW RISK	MODERATE RISK <ul style="list-style-type: none"> Adhere to existing national forest policies, forest programmes or equivalent strategies. 	

⁹⁹ Food and Agriculture Organization of the United Nations. 2011. Biosafety Resource Book. Rome, <http://www.fao.org/docrep/014/i1905e/i1905e00.htm>

			<ul style="list-style-type: none"> • The observance of principles 9, 10, 11 and 12 of the Voluntary Guidelines on Planted Forests suffice for indigenous forests but must be read in full compliance with ESS 9- Indigenous People and Cultural Heritage. • Planners and managers must incorporate conservation of biological diversity as fundamental in their planning, management, utilization and monitoring of planted forest resources. • In order to reduce the environmental risk, incidence and impact of abiotic and biotic damaging agents and to maintain and improve planted forest health and productivity, FAO will work together with stakeholders to develop and derive appropriate and efficient response options in planted forest management. 	
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SAFEGUARD 4 ANIMAL (LIVESTOCK AND AQUATIC) GENETIC RESOURCES FOR FOOD AND AGRICULTURE

	Introduce new species/breeds and change in the production system of locally adapted breeds	No	Yes	Comments
4.1	Would this project introduce non-native or non-locally adapted species, breeds, genotypes or other genetic material to an area or production system?	LOW RISK	PROCEED TO NEXT Q	

	4.1.1	Would this project foresee an increase in production by at least 30% (due to the introduction) relative to currently available locally adapted breeds and can monitor production performance?	CANNOT PROCEED	LOW RISK	
	4.1.2	Would this project introduce genetically altered organisms, e.g. through selective breeding, chromosome set manipulation, hybridization, genome editing or gene transfer and/or introduce or use experimental	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	

		genetic technologies, e.g. genetic engineering and gene transfer, or the products of those technologies?			
4.2	Would this project introduce a non-native or non-locally adapted species or breed for the first time into a country or production system?	LOW RISK	MODERATE RISK A genetic impact assessment should be conducted prior to granting permission to import (cover the animal identification, performance recording and capacity development that allow monitoring of the introduced species/ breeds' productivity, health and economic sustainability over several production cycles) <ul style="list-style-type: none">• http://www.fao.org/docrep/012/i0970e/i0970e00.htm• ftp://ftp.fao.org/docrep/fao/012/i0970e/i0970e03.pdf		
4.3	Would this project introduce a non-native or non-locally adapted species or breed, independent whether it already exists in the country?	LOW RISK	MODERATE RISK <ul style="list-style-type: none">• If the project imports or promotes species/breeds with higher performance than locally adapted ones, ensure: feed resources, health management, farm management capacity, input supply and farmer organization to allow the new species/breeds to express their genetic potential• Follow the OIE terrestrial or aquatic code to ensure the introduced		

			<p>species/breed does not carry different diseases than the local ones</p> <ul style="list-style-type: none"> • Include a health risk assessment and farmer/veterinary capacity development in the project to ensure the introduced species/breed do not have different susceptibility to local diseases including ecto-and endo-parasites than the locally adapted/native species/breeds. 	
4.4	<p>Would this project ensure there is no spread of the introduced genetic material into other production systems (i.e. indiscriminate crossbreeding with locally adapted species/breeds)?</p>	<p>MODERATE RISK</p> <p>Introduce a) animal identification and recording mechanism in the project and b) develop new or amend existing livestock policy and National Strategy and Action Plan for AnGR</p>	<p>LOW RISK</p>	

	Collection of wild genetic resources for farming systems	No	Yes	Comments
4.5	Would this project collect living material from the wild, e.g. for breeding, or juveniles and eggs for on-growing?	LOW RISK	MODERATE RISK Guidance to be provided	

	Modification of habitats	No	Yes	Comments
4.6	Would this project modify the surrounding habitat or production system used by existing genetic resources?	LOW RISK	MODERATE RISK Guidance to be provided	
4.7	Would this project be located in or near an internationally recognized conservation area e.g. Ramsar or World Heritage Site, or other nationally important habitat, e.g. national park or high nature value farmland?	LOW RISK	MODERATE RISK Guidance to be provided	
4.8	AQGR Would this project block or create migration routes for aquatic species?	LOW RISK	MODERATE RISK Guidance to be provided	

4.9	Would this project change the water quality and quantity in the project area or areas connected to it?	LOW RISK	MODERATE RISK Guidance to be provided	
4.10	Would this project cause major habitat / production system changes that promote new or unknown chances for geneflow, e.g. connecting geographically distinct ecosystems or water bodies; or would it disrupt habitats or migration routes and the genetic structure of valuable or locally adapted species/stocks/breeds?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	
4.11	Would this project involve the intensification of production systems that leads to land- use changes (e.g. deforestation), higher nutrient inputs leading to soil or water pollution, changes of water	LOW RISK	MODERATE RISK Guidance to be provided	

	regimes (drainage, irrigation)?			
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SAFEGUARD 5 PEST AND PESTICIDES MANAGEMENT

	Supply of pesticides by FAO	No	Yes	Comments
5.1	Would this project procure, supply and/or result in the use of pesticides on crops, livestock, aquaculture or forestry?	LOW RISK	<p>MODERATE RISK</p> <ul style="list-style-type: none"> • Preference must always be given to sustainable pest management approaches such as Integrated Pest Management (IPM), the use of ecological pest management approaches and the use of mechanical/cultural/physical or biological pest control tools in favour of synthetic chemicals; and preventive measures and monitoring, • When no viable alternative to the use of chemical pesticides exists, the selection and procurement of pesticides is subject to an internal clearance procedure http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/E_SS5_pesticide_checklist.pdf • The criteria specified in FAO's ESM Guidelines under ESS5 must be adhered to and should be included or referenced in the project document. 	

			<ul style="list-style-type: none"> • If large volumes (above 1,000 litres of kg) of pesticides will be supplied or used throughout the duration of the project, a Pest Management Plan must be prepared to demonstrate how IPM will be promoted to reduce reliance on pesticides, and what measures will be taken to minimize risks of pesticide use. • It must be clarified, which person(s) within (executing) involved institution/s, will be responsible and liable for the proper storage, transport, distribution and use of the products concerned in compliance with the requirements. 	
5.2	Would this project provide seeds or other materials treated with pesticides (in the field and/or in storage) ?	LOW RISK	<p>MODERATE RISK</p> <p>The use of chemical pesticides for seed treatment or storage of harvested produce is subject to an internal clearance procedure [http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/E_SS5_pesticide_checklist.pdf]. The criteria specified in FAO's ESM Guidelines under ESS5 for both pesticide supply and seed treatment must be adhered to and should be included or referenced in the project document.</p>	
5.3	Would this project provide inputs to farmers directly or through voucher schemes?	LOW RISK	<p>MODERATE RISK</p> <ul style="list-style-type: none"> • FAO projects must not be responsible for exposing people or the 	

			<p>environment to risks from pesticides. The types and quantities of pesticides and the associated application and protective equipment that users of a voucher scheme are provided with must always comply with the conditions laid out in ESS5 and be subject to the internal clearance procedure [link]. These must be included or referenced in the project document.</p> <ul style="list-style-type: none"> • Preference must always be given to sustainable pest management approaches such as Integrated Pest Management (IPM), the use of ecological pest management approaches and the use of mechanical or biological pest control tools in favour of synthetic chemicals 	
5.4	Would this project lead to increased use of pesticides through intensification or expansion of production?	LOW RISK	<p>MODERATE RISK</p> <p>Encourage stakeholders to develop a Pest Management Plan to demonstrate how IPM will be promoted to reduce reliance on pesticides, and what measures will be taken to minimize risks of pesticide use. This should be part of the sustainability plan for the project to prevent or mitigate other adverse environmental and social impacts resulting from production intensification.</p>	
5.5	Would this project manage or dispose of waste pesticides, obsolete	LOW RISK	<p>HIGH RISK</p> <p>A full environmental and social impact assessment is required.</p>	

	pesticides or pesticide contaminated waste materials?		Please contact the ESM unit for further guidance.	
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SAFEGUARD 6 INVOLUNTARY RESETTLEMENT AND DISPLACEMENT

		No	Yes	Comments
6.1	Would this removal* be voluntary? *temporary or permanent removal of people from their homes or means of production/livelihood or restrict their access to their means of livelihoods	CANNOT PROCEED	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	

SAFEGUARD 7 DECENT WORK

		No	Yes	Comments
7.1	Would this project displace jobs? (e.g. because of sectoral restructuring or occupational shifts)	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	
7.2	Would this project operate in sectors or value chains that are dominated by subsistence producers and other vulnerable informal agricultural workers, and more generally characterized by high levels “working poverty”?	LOW RISK	MODERATE RISK Take action to anticipate the likely risk of perpetuating poverty and inequality in socially unsustainable agriculture and food systems. Decent work and productive employment should appear among the priorities of the project or, alternatively, the project should establish synergies with specific employment and social protection programmes e.g. favouring access to some social protection scheme or form of social	

			insurance. Specific measures and mechanisms should be introduced to empower in particular the most vulnerable /disadvantaged categories of rural workers such as small-scale producers, contributing family workers, subsistence farmers, agricultural informal wage workers, with a special attention to women and youth who are predominantly found in these employment statuses. An age- and gender-sensitive social value chain analysis or livelihoods/employment assessment is needed for large-scale projects.	
7.3	Would this project operate in situations where youth work mostly as unpaid contributing family workers, lack access to decent jobs and are increasingly abandoning agriculture and rural areas?	LOW RISK	<p>MODERATE RISK</p> <p>Take action to anticipate likely risk of unsustainably ageing agriculture and food systems by integrating specific measures to support youth empowerment and employment in agriculture. A youth livelihoods/employment assessment is needed.</p> <p>Complementary measures should be included aiming at training youth, engaging them and their associations in the value chain, facilitating their access to productive resources, credit and markets, and stimulating youth- friendly business development services.</p>	
7.4	Would this project operate in situations where major gender inequality in the labour market prevails? (e.g. where women tend to work predominantly as unpaid contributing family members or subsistence farmers, have	LOW RISK	<p>MODERATE RISK</p> <p>Take action to anticipate likely risk of socially unsustainable agriculture and food systems by integrating specific measures to reduce gender inequalities and promote rural women's social and economic empowerment. A specific social value chain analysis or livelihoods/employment assessment is needed for large-scale projects.</p>	

	lower skills and qualifications, lower productivity and wages, less representation and voice in producers' and workers' organizations, more precarious contracts and higher informality rates, etc.)		Facilitation should be provided for women of all ages to access productive resources (including land), credit, markets and marketing channels, education and TVET, technology, collective action or mentorship. Provisions for maternity protection, including child care facilities, should be foreseen to favour women participation and anticipate potential negative effects on child labour, increased workloads for women, and health related risks for pregnant and breastfeeding women.	
7.5	Would this project operate in areas or value chains with presence of labour migrants or that could potentially attract labour migrants?	LOW RISK	MODERATE RISK Take action to anticipate potential discrimination against migrant workers, and to ensure their rights are adequately protected, with specific attention to different groups like youth, women and men.	

		No	Yes	Comments
7.6	Would this project directly employ workers?	LOW RISK	MODERATE RISK FAO projects will supposedly guarantee employees' rights as per UN/FAO standards as regards information on workers' rights, regularity of payments, etc. Decisions relating to the recruitment of project workers are supposed to follow standard UN practices and therefore not be made on the basis of personal characteristics unrelated to inherent job requirements. The employment of project workers will be based on the principle of equal opportunity and fair treatment, and there will be no discrimination with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits),	

			working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, etc.	
7.7	Would this project involve sub-contracting?	LOW RISK	MODERATE RISK Take action to anticipate likely risk of perpetuating inequality and labour rights violations by introducing complementary measures. FAO projects involving sub-contracting should promote, to the extent possible, subcontracting to local entrepreneurs – particularly to rural women and youth – to maximize employment creation under decent working conditions. Also, FAO should monitor and eventually support contractors to fulfil the standards of performance and quality, taking into account national and international social and labour standards.	

		No	Yes	Comments
7.8	Would this project operate in a sector, area or value chain where producers and other agricultural workers are typically exposed to significant occupational and safety risks ¹⁰⁰ ?	LOW RISK	MODERATE RISK Take action to anticipate likely OSH risks by introducing complementary provisions on OSH within the project. Project should ensure all workers' safety and health by adopting minimum OSH measures and contributing to improve capacities and mechanisms in place for OSH in informal agriculture and related occupations. For example, by undertaking a simple health and safety risk assessment, and supporting implementation of the identified risk control measures. Awareness raising and	

¹⁰⁰ Major OSH risks in agriculture include: dangerous machinery and tools; hazardous chemicals; toxic or allergenic agents; carcinogenic substances or agents; parasitic diseases; transmissible animal diseases; confined spaces; ergonomic hazards; extreme temperatures; and contact with dangerous and poisonous animals, reptiles and insects.

			<p>capacity development activities on the needed gender-responsive OSH measures should be included in project design to ensure workers' safety and health, including for informal workers. Complementary measures can include measures to reduce risks and protect workers, as well as children working or playing on the farm, such as alternatives to pesticides, improved handling and storage of pesticides, etc.</p> <p>Specific provisions for OSH for pregnant and breastfeeding women should be introduced. FAO will undertake periodic inspections and a multistakeholder mechanism for monitoring should be put in place.</p>	
7.9	Would this project provide or promote technologies or practices that pose occupational safety and health (OSH) risks for farmers, other rural workers or rural populations in general?	LOW RISK	<p>HIGH RISK</p> <p>A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.</p>	

		No	Yes	Comments
7.10	Would this project foresee that children <u>below</u> the nationally-defined minimum employment age (usually 14 or 15 years old) will be involved in project-supported activities?	LOW RISK	CANNOT PROCEED	
7.11		LOW RISK	MODERATE RISK	

	<p>Would this project foresee that children <u>above</u> the nationally-defined minimum employment age (usually 14 or 15 years old), but under the age of 18 will be involved in project-supported activities?</p>		<p>Take action to anticipate likely risk of engaging young people aged 14-17 in child labour¹⁰¹ by changing design or introducing complementary measures.</p> <p>For children of 14 to 17 years, the possibility to complement education with skills-training and work is certainly important for facilitating their integration in the rural labour market. Yet, children under the age of 18 should not be engaged in work-related activities in connection with the project in a manner that is likely to be hazardous or interfere with their compulsory child's education or be harmful to the child's health, safety or morals. Where children under the age of 18 may be engaged in work-related activities in connection with the project, an appropriate risk assessment will be conducted, together with regular monitoring of health, working conditions and hours of work, in addition to the other requirement of this ESS. Specific protection measures should be undertaken to prevent any form of sexual harassment or exploitation at work place (including on the way to and from), particularly those more vulnerable, i.e. girls.</p>	
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¹⁰¹ Child labour is defined as work that is inappropriate for a child's age, affects children's education, or is likely to harm their health, safety or morals. Child labour refers to working children below the nationally-defined minimum employment age, or children of any age engaging in hazardous work. Hazardous work is work that is likely to harm the health, safety or morals of a child. This work is dangerous or occurs under unhealthy conditions that could result in a child being killed, or injured and/or made ill as a consequence of poor health and safety standards and working arrangements. Some injuries or ill health may result in permanent disability. Countries that have ratified ILO Convention No.182 are obligated to develop National lists of hazardous child labour under Article 4.

7.12	Would this project operate in a value chain where there have been reports of child labour?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	
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		No	Yes	Comments
7.13	Would this project operate in a value chain or sector where there have been reports of forced labour ¹⁰² ?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	

¹⁰² Forced labour is employed, consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty. It includes men, women and children in situations of debt bondage, suffering slavery-like conditions or who have been trafficked. "In many countries, agricultural work is largely informal, and legal protection of workers is weak. In South Asia, there is still evidence of bonded labour in agriculture, resulting in labour arrangements where landless workers are trapped into exploitative and coercive working conditions in exchange for a loan. The low wages associated with high interest rates make it quite difficult for whole families to escape this vicious circle. In Africa, the traditional forms of "vestiges of slavery" are still prevalent in some countries, leading to situations where whole families (adults and children, men and women) are forced to work the fields of landowners in exchange for food and housing. In Latin America, the case of workers recruited in poor areas and sent to work on plantations or in logging camps has been widely documented by national inspection services and other actors." (ILO, Profits and poverty: the economics of forced labour / International Labour Office. - Geneva: ILO, 2014)

SAFEGUARD 8 GENDER EQUALITY

		No	Yes	Comments
8.1	Could this project risk reinforcing existing gender-based discrimination, by not taking into account the specific needs and priorities of women and girls?	LOW RISK	MODERATE RISK Take action to anticipate likely risk of perpetuating or reinforcing inequality by conducting a gender analysis to identify specific measures to avoid doing harm, provide equal opportunities to men and women, and promote the empowerment of women and girls.	
8.2	Could this project not target the different needs and priorities of women and men in terms of access to services, assets, resources, markets, and decent employment and decision-making?	LOW RISK	MODERATE RISK Take action to anticipate likely risk of socially unsustainable agriculture practices and food systems by conducting a gender analysis to identify the specific needs and priorities of men and women, and the constraints they may face to fully participate in or benefit from project activities, and design specific measures to ensure women and men have equitable access to productive resources and inputs.	

SAFEGUARD 9 INDIGENOUS PEOPLES AND CULTURAL HERITAGE

		No	Yes	Comments
9.1	Are there <i>indigenous peoples*</i> living <i>outside the project area**</i> where activities will take place? ¹⁰³	LOW RISK	GO TO NEXT QUESTION	

* FAO considers the following criteria to identify indigenous peoples: priority in time with respect to occupation and use of a specific territory; the voluntary perpetuation of cultural distinctiveness (e.g. languages, laws and institutions); self-identification; an experience of subjugation, marginalization, dispossession, exclusion or discrimination (whether or not these conditions persist).

	9.1.1	Do the project activities influence the Indigenous Peoples living outside the project area?	LOW RISK	MODERATE RISK A Free, Prior and Informed Consent Process is required Project activities should outline actions to address and mitigate any potential impact Please contact the ESM/OPCA unit for further guidance.	
9.2		Are there indigenous peoples living in the project area where activities will take place?	LOW RISK	MODERATE RISK A Free Prior and Informed Consent process is required. If the project is for indigenous peoples, an Indigenous Peoples' Plan is required in addition to the Free Prior and Informed Consent process. Please contact the ESM/OPCA unit for further guidance. In cases where the project is for both, indigenous and non-indigenous peoples, an Indigenous Peoples' Plan will be required only if a substantial number of beneficiaries are Indigenous Peoples. project activities should outline actions to address and mitigate any potential impact. Please contact ESM/OPCA unit for further guidance. A Free, Prior and Informed Consent Process is required	

** The phrase "Outside the project area" should be read taking into consideration the likelihood of project activities to influence the livelihoods, land access and/or rights of Indigenous Peoples' irrespective of *physical distance*. In example: If an indigenous community is living 100 km away from a project area where fishing activities will affect the river yield which is also accessed by this community, then the user should answer "YES" to the question

9.3	<p>Would this project adversely or seriously affect on indigenous peoples' rights, lands, natural resources, territories, livelihoods, knowledge, social fabric, traditions, governance systems, and culture or heritage (<i>physical*</i> and <i>non-physical or intangible**</i>) inside and/or outside the project area?</p> <p><i>*Physical defined as movable or immovable objects, sites, structures, group of structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic or other cultural significance located in urban or rural settings, ground, underground or underwater.</i></p> <p><i>**Non-physical or intangible defined as "the practices, representations, expressions, knowledge</i></p>	LOW RISK	<p>HIGH RISK</p> <p>A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.</p>	
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	<i>and skills as well as the instruments, objects, artifacts and cultural spaces associated therewith that communities, groups, and in some cases individuals, recognize as part of their spiritual and/or cultural heritage"</i>			
9.4	Would this project be located in an area where cultural resources exist?	LOW RISK	<p>MODERATE RISK</p> <p>To preserve cultural resources (when existing in the project area) and to avoid their destruction or damage, due diligence must be undertaken to:</p> <p>a) verify that provisions of the normative framework, which is usually under the oversight of a national institution responsible for protection of historical and archaeological sites/intangible cultural heritage; and b) through collaboration and communication with indigenous peoples' own governance institutions/leadership, verifying the probability of the existence of sites/intangible cultural heritage that are significant to indigenous peoples.</p> <p>In cases where there is a high chance of encountering physical cultural resources, the bidding documents and contract for any civil works must refer to the need to include recovery of "chance</p>	

			findings” in line with national procedures and rules.	
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