



# CLIMATE INVESTMENT MOBILIZATION PLAN



December 2022

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## LIST OF ACRONYMS

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BAU	Business As Usual
CCDR	Climate Change and Development Report
CCTV	Closed-circuit television
CIMP	Climate Investment Mobilization Plan
CHP	Central and Heat Power Units
COP	Conference of Parties
DISCOs	Distribution Electricity Companies
EMRRC	Energy and Mineral Resources Regulatory Commission
EPC	Energy Performance Contract
ESCO	Energy Service Company
EV	Electric Vehicle
EVSE	Electric vehicle supply equipment
FCCL	Financial Commitment and Contingent Liability
GAM	Greater Amman Municipality
GBD	General Budget Department
GCF	Green Climate Fund
GG-NAP	National Green Growth Plan
GHG	Greenhouse Gas
GoJ	Government of Jordan
HAEDJo	The Jordan Hydroponics Agriculture and Employment Development Project
HVAC	Heating, Ventilation, and Air Conditioning
IAA	Integrated Aquaculture Agriculture
ICT	Information Communications Technology
IRR	Internal Rate of Return
ITS	Intelligent Transport Systems
JSMO	Jordan Standards and Meteorological Department
JVA	Jordan Valley Authority
M&E	Monitoring and Evaluation
MEMR	Ministry of Energy and Mineral Resources
MOE	Ministry of Education
MoEnv	Ministry of Environment
MOF	Ministry of Finance
MOH	Ministry of Health
MOPIC	Ministry of Planning and International Cooperation
MOPWH	Ministry of Public Works and Housing

MRV	Measurement, Reporting and Verification
MWI	Ministry of Water and Irrigation
NAP	National Adaptation Plan
NGGP	National Green Growth Plan
NEPCO	National Electricity Production Company
NDC	National Determined Contributions
NDCP	NDC Partnership Action Plan
NRW	Non-Revenue Water
PIM	Public Investment Management
PIP	Public Investment Project
PPA	Power Purchase Agreements
PPP	Public-Private Partnership
PS	Pumping Station
PV	Photovoltaic
SDG	Sustainable Development Goals
SME	Small and medium-sized enterprises
SEP	Stakeholder Engagement Plan
UNFCCC	United Nations Framework Convention on Climate Change
VGf	Viability Gap Financing
WAJ	Water Authority of Jordan
WWTP	Wastewater Treatment Plant

## SECTION 1. PURPOSE

Climate Investment Mobilization Plan prioritizes climate responsive projects to engage the private sector, establish Jordan as an attractive destination for climate investments and support the achievement of Jordan's NDCs. Upon the approval of the Executive Plan for The Economic Modernization Vision (December 27, 2022), this plan was developed for nine climate responsive projects that lie within the priority plan approved by the Council of Ministers. One additional project that is also considered as climate responsive priority "Energy Efficiency and Green Buildings Retrofits in Public Buildings - Phase 1". This plan is designed for ten projects that are fully aligned with the overall goals of the Jordan's Economic Modernisation Vision (2023-2030), the National Climate Change Policy (2022 – 2050), and Jordan's NDCs.

This plan establishes the process to be followed for mobilization of financing for priority climate responsive investments. The process supports (a) transforming each climate investment priority area into financing packages with clear project and policy boundaries, (b) identifying financing approaches in consultation with government stakeholders, development partners and private sector, (c) organizing project financing dialogues with relevant stakeholders and (d) gradually improving the alignment with Climate Change Measurement, Reporting and Verification (MRV) and carbon market mechanisms and the Monitoring and Evaluation (M&E) of the Jordan National Climate Change Policy.

### 1. Jordan's national climate change context

Climate change is already a measurable reality and Jordan, along with other developing countries, is vulnerable to its impacts. Jordan has warmed significantly over the past decades and drastic warming with average temperature increases of 2.1 – 4 °C projected for Jordan over the next few decades, making climate change the defining context for Jordan's development, with economic, social, and ecological ramifications. Climate change poses a significant risk to Jordan's development gains, exacerbating the existing national challenge of widespread poverty, unemployment, and inequality and undermining the country's efforts to achieve the United Nations Sustainable Development Goals (SDGs). However, these challenges also present opportunities for climate adaptation, mitigation, and the green economy. In this context, climate finance has become an important instrument to support the Government of Jordan (GoJ) in addressing the challenges and harnessing opportunities associated with climate change.

A major, rapid and sustained investment push is needed to drive a strong and sustainable recovery from the COVID-19 crisis, transform economic growth, and deliver on shared development and climate goals. An effective climate change response is complex and

transcends multiple socio-economic and environmental sectors and spheres of government. It thus requires coherence, coordination, alignment, and sequencing of policies, response measures, and concentrated implementation of actions by various role-players, all of which constitute Jordan's climate change response value chain.

This climate investment mobilization plan seeks to contribute to informing the mobilization of climate finance in light of the climate change impacts across all sectors. The report prioritizes investments across all sectors and proposes various options for climate financing and ranks the most efficient option. The United Nations Framework Convention on Climate Change (UNFCCC) has defined climate finance as local, national, or transnational financing drawn from public, private and alternative sources of financing that seek to support mitigation and adaptation actions that will address climate change.

## **2. Investment pathways toward adaptation, resilience, and low-carbon growth**

There is an urgent need to boost investment in all forms of capital – human, physical, social, and natural – and benefit from the opportunities offered by a low-carbon future. Investment and innovation can drive new and better forms of growth and development through the transformation of key strategic sectors – water, energy, transport, agriculture, and urban development – with circularity principles at their core.

Jordan updated its National Determined Contributions (NDC) in October 2021 raising its GHG emission reduction target from 14 percent to 31 percent of the Business As Usual (BAU) scenario by 2030, this includes an unconditional commitment of 5 percent using the country's financing and 26 percent conditional upon availability and access to funding support. The estimated total cost for achieving the 31 percent goal in Jordan NDC is over US\$7.5 billion, of which the GOJ intends to invest around 5 percent (US\$565 million) through its means. The remaining financing gap is expected to be addressed through mobilizing private sector investment as well as through support from international financial institutions. The US\$7.5 billion is an estimate for mitigation actions, while the adaptation efforts would increase the gap further. This requires new and additional finances to meet the growing cost of addressing climate change.

The Government of Jordan (GoJ) adopted an economic modernization strategy, the Economic Modernization Vision 2022-2033, in June 2022, which aims at doubling Jordan's growth rate, while also calling for a significant increase in both public and private investment. The economic modernization vision highlights the role of the private sector and the incentives that need to be introduced to mobilize the finance from the private sector to achieve sustainable economic development. The overall estimated investment needs for achieving the Vision's objectives amount to a net increase of capital investments of Jordanian Dinar (JD) 41.4 billion (US\$ 58.4 billion) between 2023 and 2033. Most of it

(73 percent) is expected to come from private investments (foreign direct investment (FDI), domestic investments, and public-private partnerships (PPPs). Accordingly, mobilizing private climate financing in greening the economy offers a huge opportunity for the country and can be achieved through a variety of tools from leveraging public-private partnerships (PPPs) to incentivization of green loans and green bonds.

Jordan's 2022 Country Climate and Development Report (CCDR) estimates the country's incremental investment needs for resilient and low-carbon development in key sectors at US\$9.5 billion for priority actions to be fully implemented by 2030.

An aggregation of mitigation measures as per the NDC is shown in table (1) and covers a wide range of sectors including energy, water, solid water, transport, industry, agriculture, and forestry.

**Table 1: Aggregated mitigation measures as per the 2021 updated NDC**

No.	Sector	No. of Measures	Expected Implementation Cost (USD)	Cumulative Emission Reduction (Gg CO <sub>2eq</sub> )
1.	Energy	4	82,470,800	9,187
2.	Water	1	2,820,910,000	799.1
3.	Transport	4	462,365,771	8,972.34
4.	Solid waste/Urban	2	12,618,226	1,716.8
5.	Wastewater	1	20,000,000	557
6.	Industry	6	18,810,000	2,363.85
7.	Agriculture and Forestry	4	13,750,000	6,118.21
<b>TOTAL</b>		<b>22</b>	<b>7,539,553,997</b>	

Furthermore, the updated NDC provides a summary of key investment measures in adaptation-related sectors that have been identified through national plans including the 2021 National Adaptation Plan (NAP), NDC Partnership Action Plan (NDGP), and the National Green Growth Plan (GG-NAP) which cover water, agriculture, and the health sectors. An aggregation of these measures is shown in table (2) and per sector. A copy of all relevant national climate policies and plans is included in Annexes (2), and (3).

**Table 2: Aggregated adaptation measures as per Jordan National Plans**

No.	Sector	No. of Measures	Expected Implementation Cost (USD)
1.	Water	11	214,866,328
2.	Agriculture	9	113,497,830
3.	Health	1	1,801,672
<b>TOTAL</b>		<b>21</b>	<b>329,445,830</b>

In addition, the Climate Change Unit under the leadership of the Ministry of Environment identified three priority lists to consider when developing the investment pipeline, which included:

- The Priority actions from GG-NAP and NDC (18 Priority actions) in the (Transport, Water, Waste, Energy, Agriculture, and Tourism) sectors which included mitigation and adaptation actions with an expected implementation cost of US\$717,002,418
- NDC Partnership Prioritization List (35 Project actions) as per Ministry of Environment Letter Ref. 7-2-2602 dated 17-3-2020 in the (Water, Agriculture, Health, Transport, and Energy) sectors including the Cost Benefit Analysis Report for these (35 priority actions) contributing to Jordan's NDC, April 2021 with an expected implementation cost exceeding US\$1 billion
- The World Bank group, building on the reports listed above, assessed investment needs towards enhancing 'water-energy-food security' and 'low-carbon and resilient urban growth' as part of the Jordan Country Climate and Development Report (CCDR).

Within this context, more than 100 projects have been identified from the mentioned key national documents. After analyzing all the projects and applying the established criteria the following 4 key thematic areas were selected as national priorities:

- Theme (1): Increase water security through efficient resource use
  - Substituting Fresh Water with Treated Wastewater for irrigation use
  - Improve Irrigation Efficiency in the Jordan Valley (Mid Ghors) through rehabilitating and upgrading existing irrigation networks
  - Increase the use of aquaponics and hydroponics in urban and rural areas
- Theme (2): Enhancing energy security through Renewable Energy and Energy Efficiency
  - Renewable Energy and Energy Efficiency in wellfields and water pumping stations
  - Energy Efficiency and Green Buildings Retrofits in Public Buildings - Phase 1
- Theme (3): Protect natural environment and create rural jobs
  - Ecosystem restoration
  - Management and harvesting of rainwater by farmers in rural areas, for improved water storage and reduced soil erosion
- Theme (4): Improving mobility through Smart and efficient Transportation
  - Implement Electric Vehicle (EV) Charging Stations and Service Provision in Greater Amman Municipality (GAM)
  - Intelligent Transport Systems (ITS) in Jordan
  - Electric Bus Fleet in Amman, Karak, Ma'an, and Tafileh for Use in Public transport and Government Fleet - Phase 1

The document refers “themes” to present different “project concepts” since a theme is a central idea or conceptual approach that determines how individual components or “projects” are best connected to each other to produce a cumulative effect that is far greater than the total effect generated by the individual components if they were disconnected. However, the “value chain” is a different assembly of investment projects and policy actions with differing degrees of adaptation/mitigation results, funding sources, and implementation models as per the options which are shown in tables in Annex 1 which contributes to the theme itself.

It is also important to highlight that this list prioritizes projects that can begin implementation in 2023 and provide high level of climate change impact and local development benefit. The list did not consider the projects that are already in pre-feasibility study stage by multilateral development organization and donors.

The projects, covering all sectors water, energy, transportation, agriculture and urban development, offer a unique opportunity to attract needed investment, particularly from the private sector, but are currently not well defined and strategically developed from a climate responsive and sustainable economic growth perspective. Thus, having a clear and comprehensive climate investment pipeline and mobilization plan that identifies bankable projects, and relevant financing resources will be key to attract climate-responsive investment to Jordan.

Annex 1 provides a high-level summary of the of climate and green financing sources that could be considered for each of the climate investment projects proposed in this document.

## SECTION 2: DESCRIPTION OF THE THEMATIC AREAS

Jordan's trajectory in meeting its climate and development goals will be determined largely by the policy and investment choices the country makes in strategic sectors or water, energy, agriculture, transport and urban development. The transformation of those sectors towards a resilient and low carbon path would need to be closely coordinated along two nexuses to maximize co-benefits and to reduce potentially negative socio-economic impacts: the water-energy-food security nexus, in a context of extreme water scarcity, and the urban-transport-energy nexus, which is at the core of the shift towards a low-carbon growth path.

Under these two nexuses, project themes have been identified in consultation with all of the policy documents referred to in Section 1 of this plan. **Accordingly, the document uses "themes" to present different "project concepts" since a theme** is a central idea or conceptual approach that determines how individual components or "projects" are best connected to each other to produce a cumulative effect that is far greater than the total effect generated by the individual components if they were disconnected. However, the "value chain" is a different assembly of investment projects and policy actions with differing degrees of adaptation/mitigation results, funding sources, and implementation models as per the options which are shown in tables in Annex 1 which contributes to the theme itself.

In addition, and for each theme, the climate change and local development priorities have been addressed to show contribution to climate change and national objectives. It has also been assessed and found to fully align with both the 2033 national economic modernization vision and the (2022-2050) national climate change policy, as shown in table (3).

### NEXUS 1: Water-Energy-Food Security for Climate-Responsive Development

- **Theme (1): Increase water security through efficient resource use**
  1. Substituting Fresh Water with Treated Wastewater for irrigation use
  2. Improve Irrigation Efficiency in the Jordan Valley (Mid Ghors) through rehabilitating and upgrading existing irrigation networks
  3. Increase the use of aquaponics and hydroponics in urban and rural areas
- **Theme (2): Enhancing energy security through Renewable Energy and Energy Efficiency**
  4. Renewable Energy and Energy Efficiency in wellfields and water pumping stations

5. Energy Efficiency and Green Buildings Retrofits in Public Buildings - Phase 1
- **Theme (3): Protect natural environment and create rural jobs**
  6. Support rural green growth and employment through ecosystem restoration
  7. Management and harvesting of rainwater by farmers in rural areas, for improved water storage and reduced soil erosion

## **NEXUS 2: Urban-Transport-Energy Measures for Low Carbon and Resilient Development**

- **Theme (4): Improving mobility through Smart and efficient Transportation**
  8. Implement Electric Vehicle (EV) Charging Stations and Service Provision in Greater Amman Municipality (GAM)
  9. Intelligent Transport Systems (ITS) in Jordan
  10. Electric Bus Fleet in Amman, Karak, Ma'an, and Tafileh for Use in Public transport and Government Fleet - Phase 1

No.	Project under theme	Sector	Climate Change and Local Development Priorities Addressed	Overlap with the 2033 Economic Modernization Vision	Overlap with National Climate Change Policy 2022-2050
<b>Theme (1): Increase water security through efficient resource use</b>					
1.	Substituting Fresh Water with Treated Wastewater for irrigation use	Water / Agriculture	Water scarcity, increasing availability of water for the agriculture sector, support and create agriculture sector and rural jobs	<u>Economic Growth Pillar</u> Water (Upgrade water supply and demand management, monitoring, and control; Launch water conservation program)	<b>W1.2:</b> Improving water demand management and reducing the gap between water demand and supply <b>W1.4:</b> Improve efficiency in water use for sustainable development <b>W1.5:</b> Improving the contribution of non-conventional water resources to the national water budget <b>A1.1:</b> Integrating climate resilience in the policy and institutional reforms in the agricultural sector <b>A1.2:</b> Improving irrigation system efficiency <b>A1.3:</b> Inform and train farmers on cover crops cultivation and diversified crop rotation <b>WM1.2:</b> Develop the wastewater recovery network coupled with

No.	Project under theme	Sector	Climate Change and Local Development Priorities Addressed	Overlap with the 2033 Economic Modernization Vision	Overlap with National Climate Change Policy 2022-2050
					<p>methane recovery for energy uses and compositing of sludge</p> <p><b>LI3.2:</b> Provide technical capacity building of stakeholders to fulfill their respective roles and responsibilities</p> <p><b>LI3.3:</b> Develop a Stakeholder Engagement Plan (SEP) for engaging all key stakeholders in dialogues on climate change and formulation of sectoral strategies</p> <p><b>AR1.1:</b> Develop a communication strategy based on SEP</p> <p><b>AR1.2:</b> Carry out outreach activities to cover communication and awareness raising on all climate-related issues</p>
2.	Improve Irrigation Efficiency in the Jordan Valley (Mid Ghors) through rehabilitating and upgrading existing irrigation networks	Water / Agriculture	Water scarcity, and rainfall variability, create rural and agricultural jobs, demand management	<u>Economic Growth Pillar</u> Water (Reduce NRW by 2% annually; Establish climate resilience and sustainable water use)	<b>W1.2:</b> Improving water demand management and reducing the gap between water demand and supply

No.	Project under theme	Sector	Climate Change and Local Development Priorities Addressed	Overlap with the 2033 Economic Modernization Vision	Overlap with National Climate Change Policy 2022-2050
					<p><b>W1.4:</b> Improve efficiency in water use for sustainable development</p> <p><b>W1.5:</b> Improving the contribution of non-conventional water resources to the national water budget</p> <p><b>A1.1:</b> Integrating climate resilience in the policy and institutional reforms in the agricultural sector</p> <p><b>A1.2:</b> Improving irrigation system efficiency</p> <p><b>LI3.2:</b> Provide technical capacity building of stakeholders to fulfill their respective roles and responsibilities</p> <p><b>LI3.3:</b> Develop a Stakeholder Engagement Plan (SEP) for engaging all key stakeholders in dialogues on climate change and formulation of sectoral strategies</p>

No.	Project under theme	Sector	Climate Change and Local Development Priorities Addressed	Overlap with the 2033 Economic Modernization Vision	Overlap with National Climate Change Policy 2022-2050
					<b>AR1.1:</b> Develop a communication strategy based on SEP <b>AR1.2:</b> Carry out outreach activities to cover communication and awareness raising on all climate-related issues
3.	Develop and implement a pipeline of projects and policy recommendations to increase the use of aquaponics and hydroponics in urban and rural areas	Agriculture	Water scarcity, and rainfall variability, create rural and agricultural jobs	<u>Economic Growth Pillar</u> Agriculture and Food Security (Support investment projects, AgTech, and R&D in FoodTech)	<b>A1.5:</b> Support conservation agriculture <b>L13.2:</b> Provide technical capacity building of stakeholders to fulfill their respective roles and responsibilities <b>L13.3:</b> Develop a Stakeholder Engagement Plan (SEP) for engaging all key stakeholders in dialogues on climate change and formulation of sectoral strategies <b>AR1.1:</b> Develop a communication strategy based on SEP <b>AR1.2:</b> Carry out outreach activities to cover communication and

No.	Project under theme	Sector	Climate Change and Local Development Priorities Addressed	Overlap with the 2033 Economic Modernization Vision	Overlap with National Climate Change Policy 2022-2050
					awareness raising on all climate-related issues
<b>Theme (2): Enhancing energy security through Renewable Energy and Energy Efficiency</b>					
4.	Renewable Energy and Energy Efficiency in wellfields and water pumping stations	Water / Energy	Energy security, green job creation, reduce losses in water and energy	<u>Economic Growth Pillar</u> Water (Improve the efficiency of energy use in the water sector, increase the use of renewable energy sources)  Energy (Adopt technologies and solutions for reduced emissions, decarbonization, and energy efficiency)	<b>E2.1:</b> Establishment and enforcement of standards and regulations on energy efficiency <b>E4.1:</b> Promote the use of new RE technologies for desalination plants, water treatment and purification systems, and pumping and distribution services <b>E4.2:</b> Design, adopt, and incentivize the use of more efficient water distribution and supply systems using techniques
5.	Energy Efficiency and Green Buildings Retrofits in Public Buildings - Phase 1	Energy / Urban	Energy security, job creation, lower energy consumption, reduce energy cost and water bills, lower maintenance cost	<u>Economic Growth Pillar</u> Energy (Adopt technologies and solutions for reduced emissions, decarbonization, and energy efficiency)  <u>Quality of Life</u>	<b>UD1.1:</b> Supporting urban green infrastructure interventions for climate resilience <b>UD1.4:</b> Improving building efficiency for adapting to increased heat in urban centers through enforcement of green

No.	Project under theme	Sector	Climate Change and Local Development Priorities Addressed	Overlap with the 2033 Economic Modernization Vision	Overlap with National Climate Change Policy 2022-2050
				Basic standards of living to enjoy good and safe living conditions (public facilities and services, urban design, and clean and sustainable environment – climate)	building codes and enhancing retrofitting of existing buildings
<b>Theme (3): Protect natural environment and create rural jobs</b>					
6.	Support rural green growth and employment through ecosystem restoration	Agriculture	Badia restoration, protect livelihoods, create rural jobs in the short and long term and increase the economic impact	<u>Quality of Life and Growth Drivers</u> Preserve biodiversity, and natural habitats	<b>EB1.5:</b> Guarantee food security by maintaining local breeds and varieties used in agriculture <b>EB2.1:</b> Increasing the scope of ecosystem-based adaptation in protected areas and special conservation areas <b>EB2.2:</b> Promoting ecosystem rehabilitation and restoration <b>EB2.3:</b> Enhancing the adaptive capacity of ecosystem services against extreme and long-term climate change impacts <b>LI3.2:</b> Provide technical capacity building of stakeholders to fulfill their

No.	Project under theme	Sector	Climate Change and Local Development Priorities Addressed	Overlap with the 2033 Economic Modernization Vision	Overlap with National Climate Change Policy 2022-2050
					<p>respective roles and responsibilities</p> <p><b>LI3.3:</b> Develop a Stakeholder Engagement Plan (SEP) for engaging all key stakeholders in dialogues on climate change and formulation of sectoral strategies</p> <p><b>AR1.1:</b> Develop a communication strategy based on SEP</p> <p><b>AR1.2:</b> Carry out outreach activities to cover communication and awareness raising on all climate-related issues</p>
7.	Management and harvesting of rainwater by farmers in rural areas, for improved water storage and reduced soil erosion	Water / Agriculture	Water scarcity, variable rainfall with droughts and flash floods, land degradation, and soil erosion, create rural jobs in the short and long-term	<u>Economic Growth Pillar</u> Water (Upgrade water supply and demand management, monitoring, and control; Launch water conservation program)	<p><b>W1.2:</b> Improving water demand management and reducing the gap between water demand and supply</p> <p><b>W1.4:</b> Improve efficiency in water use for sustainable development</p> <p><b>A1.1:</b> Integrating climate resilience in the policy and institutional reforms in the agricultural sector</p>

No.	Project under theme	Sector	Climate Change and Local Development Priorities Addressed	Overlap with the 2033 Economic Modernization Vision	Overlap with National Climate Change Policy 2022-2050
					<p><b>A1.2:</b> Improving irrigation system efficiency</p> <p><b>A1.3:</b> Inform and train farmers on cover crops cultivation and diversified crop rotation</p> <p><b>AF1.2:</b> Enhancement of agricultural water efficiency</p> <p><b>LI3.2:</b> Provide technical capacity building of stakeholders to fulfill their respective roles and responsibilities</p> <p><b>LI3.3:</b> Develop a Stakeholder Engagement Plan (SEP) for engaging all key stakeholders in dialogues on climate change and formulation of sectoral strategies</p> <p><b>AR1.1:</b> Develop a communication strategy based on SEP</p> <p><b>AR1.2:</b> Carry out outreach activities to cover communication and</p>

No.	Project under theme	Sector	Climate Change and Local Development Priorities Addressed	Overlap with the 2033 Economic Modernization Vision	Overlap with National Climate Change Policy 2022-2050
					awareness raising on all climate-related issues
<b>Theme (4): Improving mobility through Smart and efficient Transportation</b>					
8.	Implement Electric Vehicle (EV) Charging Stations and Service Provision in Greater Amman Municipality (GAM)	Energy / Transport	Create new green jobs, incentivize citizens to adopt electric vehicles, and reduce urban local air pollution	<u>Economic Growth Pillar</u> Transport, Mobility, and Logistics (Move towards the use of clean energy in transportation)  Energy (Adopt technologies and solutions for reduced emissions, decarbonization, and energy efficiency)	<b>T2.1:</b> Develop economic and financial incentives for the uptake of hybrid and electric vehicles in both the public and private <b>T2.2:</b> Develop a regulatory framework for taxation and fees on private vehicles based on carbon emissions
9.	Intelligent Transport Systems (ITS) in Jordan	Transport	Improve safety, mobility, and efficiency, job creation, protect public health, and real-time information for better transport	<u>Economic Growth Pillar</u> Transport, Mobility, and Logistics (Make use of available technical solutions and smart apps within the sector)  ICT/Digital Economy (Accelerate the pace of government digital transformation by establishing partnerships with the private sector)	<b>T4.1:</b> Adopt real-time adaptive systems to increase traffic fluidity

No.	Project under theme	Sector	Climate Change and Local Development Priorities Addressed	Overlap with the 2033 Economic Modernization Vision	Overlap with National Climate Change Policy 2022-2050
10.	Electric Bus Fleet in Amman, Karak, Ma'an, and Tafileh for Use in Public transport and Government Fleet - Phase 1	Energy / Transport	Job creation, emissions reduction. noise pollution reduction, increase the air quality of the city	<p><u>Economic Growth Pillar</u> Transport, Mobility, and Logistics (Move towards the use of clean energy in transportation)</p> <p>Energy (Adopt technologies and solutions for reduced emissions, decarbonization, and energy efficiency)</p>	<p><b>T2.1:</b> Develop economic and financial incentives for the uptake of hybrid and electric vehicles in both the public and private</p> <p><b>T2.2:</b> Develop a regulatory framework for taxation and fees on private vehicles based on carbon emissions</p>

**Project 1 and 2: Substituting Fresh Water with Treated Wastewater for irrigation use, and Improve Irrigation Efficiency in the Jordan Valley (Mid Ghors) through rehabilitating and upgrading existing irrigation networks**

**1. Introduction**

Jordan is one of the most water-scarce countries in the world with climate change further exacerbating aridity due to increasing temperatures and reduced and more erratic rainfalls. In face of these challenges, the Ministry of Water and Irrigation (MWI) has embarked on implementing a policy to substitute fresh water with treated wastewater effluent for irrigation in the Jordan Valley. Treated wastewater generated at existing wastewater treatment plants is an important component of Jordan's water resources. Due to the terrain and the concentration of the urban population above the Jordan Valley escarpment, the majority of treated wastewater is discharged into various watercourses and flows to the Jordan Valley where it is being used on an increasing scale for irrigation.

The 2025 National Water strategy issued in 2016 reconfirmed that wastewater has value and plays a significant role in the annual water budget, and should be collected and treated to the set standards for the intended uses. In addition, MWI issued the "Water Substitution and Reuse Policy" which focuses on reusing all treated wastewater all over the country and substituting fresh Water" used for agriculture with reclaimed water and saving fresh water for domestic purposes, where possible. Currently, approximately 140 million cubic meters of treated wastewater are discharged into watercourses and eventually used indirectly after being blended with freshwater in irrigation or directly without blending<sup>1</sup>.

**2. Enhancing Water Security**

In the context of extreme water scarcity and pressing adaptation needs, coordination of policy and investment choices along the water-energy-food security can maximize co-benefits, achieve greater value for money by doing one action to achieve multiple benefits, and reduce potentially negative socio-economic impacts.

The proposed projects consists of a series of interlinked and coherent investment subprojects and policy actions that could be packaged into **two value chains** with significant value added. These activities and investment subprojects collectively aim to increase the quantity of wastewater generated, construct or rehabilitate wastewater treatment plants, operate and maintain wastewater treatment plants, generate renewable energy through sludge disposal, reuse treated wastewater in agriculture, rehabilitate

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<sup>1</sup> The Ministry of Water and Irrigation "Water Substitution and Re-use Policy", 2022

primary and secondary irrigation systems and support irrigation efficiency and innovations on the farm level. All of the above would contribute substantially to the implementation of the MWI water substitution and reuse policy and reduce the volume of freshwater used in irrigated agriculture, which would be made available for urban centers, fully in line with Jordan's National Determined Contributions (NDCs) and other climate change policies concerning both adaptation and mitigation agenda. However, each value chain contributes to the overall goal through a different assembly of investment subprojects and policy actions with differing degrees of adaptation/mitigation results, funding sources, and implementation models. The following two value chain concepts are explained to cover this objective.

### **2.1 First Value Chain**

In this concept, the different investment subprojects have been identified that will lead to the achievement of the projects above. Each subproject has its intricacies, implementation model, and funding source. It would either be implemented via a Public Investment Project (PIP) or Public Private Partnership (PPP) model and leveraging on either concessional lending, commercial lending, or equity funding.

**Proposed project location:** West and South Amman Wastewater Catchment Systems, assessed under various feasibility studies, will eventually feed the treated wastewater into the Jordan Valley (Middle Ghor feeding into the 14.5 km project site) and the farming units in that location.

### **2.2 Second Value Chain**

The private sector will operate and maintain WWTPs and the treated wastewater effluent pipeline and inject operational investments to ensure that the WWTPs meet the required technical performance standards. The most important will be the treated wastewater effluent, which must meet Jordanian standard JS 893/2006. This value chain will be built around a performance-based Operation and Maintenance contract in which the private sector will be paid a monthly wastewater treatment and a transfer fee for each unit of wastewater treated and delivered to Jordan Valley.

**Proposed project location:** The WWTPs of Yarmouk Water Company, which are the backbone of the North Jordan Valley Wastewater Reuse System, should deliver treated wastewater to the farm units and offset the freshwater systems feeding Amman and Irbid Governorates.

### **2.3 Policy Implications**

No major policy modifications over the last few years. However, PPP standard bidding and

contract documents, in addition to Performance-based Contracts for Operation and Maintenance, need to be prepared by PPP Unit.

**Table 3: Projects (1) and (2) First Value Chain**

No.	Investment subprojects	Description	Implementation Model	Funding Source	Stakeholders
1.	<b>Wastewater Networks</b>	<ul style="list-style-type: none"> <li>Design and construction of wastewater collection system (trunks, laterals, collectors, and house connections including inspection chambers)</li> <li>Design and construction of pumping stations in case of differing elevations and topographic challenges</li> </ul>	Public Investment Project (PIP)	<ul style="list-style-type: none"> <li>Technical assistance grants</li> <li>Concessional Lending</li> </ul>	<ul style="list-style-type: none"> <li>Ministry of Water and Irrigation</li> <li>Water Authority of Jordan</li> <li>Ministry of Local Administration</li> <li>Ministry of Environment</li> <li>Ministry of Planning and International Cooperation</li> <li>Government Budget Department</li> <li>Department of Land and Survey</li> <li>Ministry of Interior</li> <li>International Development Organizations</li> </ul>
2.	<b>Wastewater Treatment Plant</b>	<ul style="list-style-type: none"> <li>Design and construction of wastewater treatment plants that enable reaching the required high effluent standards and consume the least energy (activated sludge process with anaerobic digestion)</li> <li>Treatment steps would include primary clarifiers, secondary treatment, tertiary treatment, and sludge treatment</li> <li>Electricity production using Central and Heat Power Units (CHP) from the methane generated in the anaerobic digesters</li> <li>Could be greenfield or brownfield</li> </ul>	Public-Private Partnership (PPP)	<ul style="list-style-type: none"> <li>Equity</li> <li>Commercial Lending</li> <li>Viability Gap Funding (VGF)</li> <li>Insurances and guarantees</li> </ul>	<ul style="list-style-type: none"> <li>Ministry of Water and Irrigation</li> <li>Water Authority of Jordan</li> <li>Ministry of Investment / PPP Unit</li> <li>Ministry of Planning and International Cooperation / PIM Unit</li> <li>Ministry of Finance / FCCL Unit</li> <li>Ministry of Environment</li> <li>Department of Land and Survey</li> <li>Government Budget Department</li> <li>International Development Organizations</li> <li>Jordan Standards and Meteorological Department (JSMD)</li> </ul>
3.	<b>Sludge Disposal and Recycling</b>	<ul style="list-style-type: none"> <li>Design and construction of mono landfills for disposal of sludge and biosolids and electricity generation</li> <li>Design and construction of an incinerator to burn sludge, and generate solid, stable ash product, and the heat generated can be recovered from the flue gas stream and reused directly and/or converted to electrical power</li> </ul>	Public-Private Partnership (PPP)	<ul style="list-style-type: none"> <li>Equity</li> <li>Commercial Lending</li> <li>Viability Gap Funding (VGF)</li> <li>Insurances and guarantees</li> </ul>	<ul style="list-style-type: none"> <li>Ministry of Water and Irrigation</li> <li>Water Authority of Jordan</li> <li>Ministry of Investment / PPP Unit</li> <li>Ministry of Planning and International Cooperation / PIM Unit</li> <li>Ministry of Finance / FCCL Unit</li> <li>Ministry of Environment</li> <li>Department of Land and Survey</li> <li>Government Budget Department</li> <li>International Development Organizations</li> <li>Energy and Minerals Regulatory Commission</li> </ul>
4.	<b>Treated Wastewater Pipeline</b>	<ul style="list-style-type: none"> <li>Design and construction of wastewater gravity or force main to transfer treated wastewater effluent to the Jordan Valley</li> <li>Design and construction of pumping stations in case of differing elevations and topographic challenges</li> <li>Design and construction of hydropower production facilities in case of elevation drops</li> </ul>	<ul style="list-style-type: none"> <li>Public Investment Project</li> <li>Public-Private Partnership (PPP)</li> </ul>	<ul style="list-style-type: none"> <li>Technical assistance grants</li> <li>Concessional Lending</li> <li>Equity</li> <li>Commercial Lending</li> <li>Insurances and guarantees</li> </ul>	<ul style="list-style-type: none"> <li>Ministry of Water and Irrigation</li> <li>Water Authority of Jordan</li> <li>Ministry of Investment / PPP Unit</li> <li>Ministry of Planning and International Cooperation / PIM Unit</li> <li>Ministry of Finance / FCCL Unit</li> <li>Ministry of Environment</li> <li>Department of Land and Survey</li> <li>Government Budget Department</li> <li>International Development Organizations</li> </ul>
5.	<b>Primary and Secondary Irrigation System</b>	<ul style="list-style-type: none"> <li>Rehabilitation of the irrigation water distribution network and its pumps to reduce irrigation water losses. The rehabilitation work includes maintenance or replacement</li> </ul>	Public Investment Project	<ul style="list-style-type: none"> <li>Technical assistance grants</li> </ul>	<ul style="list-style-type: none"> <li>Jordan Valley Authority</li> <li>Department of Land and Survey</li> <li>Government Budget Department</li> </ul>

No.	Investment subprojects	Description	Implementation Model	Funding Source	Stakeholders
		of equipment such as pumps, valves, and generators, which will restore the irrigation capacity in the targeted communities		▪ Concessional Lending	▪ International Development Organizations
6.	<b>Farming Units</b>	▪ Support local farmers in increasing water and energy efficiency, productivity, and sustainability by installing Solar PV pumps, water-efficient systems, and smart irrigation systems	▪ Financial Incentives	▪ Technical assistance grants ▪ Green credit line facilities	▪ Ministry of Agriculture ▪ Agricultural Credit Corporation ▪ Water Users Association ▪ Jordan Renewable Energy and Energy Efficiency Fund ▪ Local Jordanian Banks

**Table 4: Projects (1) and (2) Second Value Chain**

No.	Investment subprojects	Description	Implementation Model	Funding Source	Stakeholders
1.	<b>Wastewater Treatment Plant (WWTP) Operation and Maintenance</b>	<ul style="list-style-type: none"> <li>▪ Constructed wastewater treatment plants that enable reaching the required high effluent standards and consume the least energy (activated sludge process with anaerobic digestion)</li> <li>▪ Treatment steps include primary clarifiers, secondary treatment, tertiary treatment, and sludge treatment</li> <li>▪ Electricity production using Central and Heat Power Units (CHP) from the methane generated in the anaerobic digesters</li> </ul>	▪ Performance-based Operation and Maintenance and Operational Investments	<ul style="list-style-type: none"> <li>▪ Equity</li> <li>▪ Commercial Lending</li> <li>▪ Insurances and guarantees</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Water and Irrigation</li> <li>▪ Water Authority of Jordan</li> <li>▪ Ministry of Investment / PPP Unit</li> <li>▪ Ministry of Planning and International Cooperation / PIM Unit</li> <li>▪ Ministry of Finance / FCCL Unit</li> <li>▪ Ministry of Environment</li> <li>▪ Department of Land and Survey</li> <li>▪ Government Budget Department</li> <li>▪ International Development Organizations</li> <li>▪ Jordan Standards and Meteorological Department (JSMO)</li> </ul>
2.	<b>Treated Wastewater Pipeline Operation and Maintenance</b>	<ul style="list-style-type: none"> <li>▪ Constructed wastewater gravity to transfer treated wastewater effluent to the Jordan Valley</li> <li>▪ To be constructed hydropower production facilities</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public Investment Project</li> <li>▪ Performance-based Operation and Maintenance and Operational Investments</li> </ul>	<ul style="list-style-type: none"> <li>▪ Concessional Lending</li> <li>▪ Equity</li> <li>▪ Commercial Lending</li> <li>▪ Insurances and guarantees</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Water and Irrigation</li> <li>▪ Water Authority of Jordan</li> <li>▪ Ministry of Investment / PPP Unit</li> <li>▪ Ministry of Planning and International Cooperation / PIM Unit</li> <li>▪ Ministry of Finance / FCCL Unit</li> <li>▪ Ministry of Environment</li> <li>▪ Department of Land and Survey</li> <li>▪ Government Budget Department</li> <li>▪ International Development Organizations</li> <li>▪ Jordan Standards and Meteorological Department (JSMO)</li> </ul>

## VALUE CHAIN 1

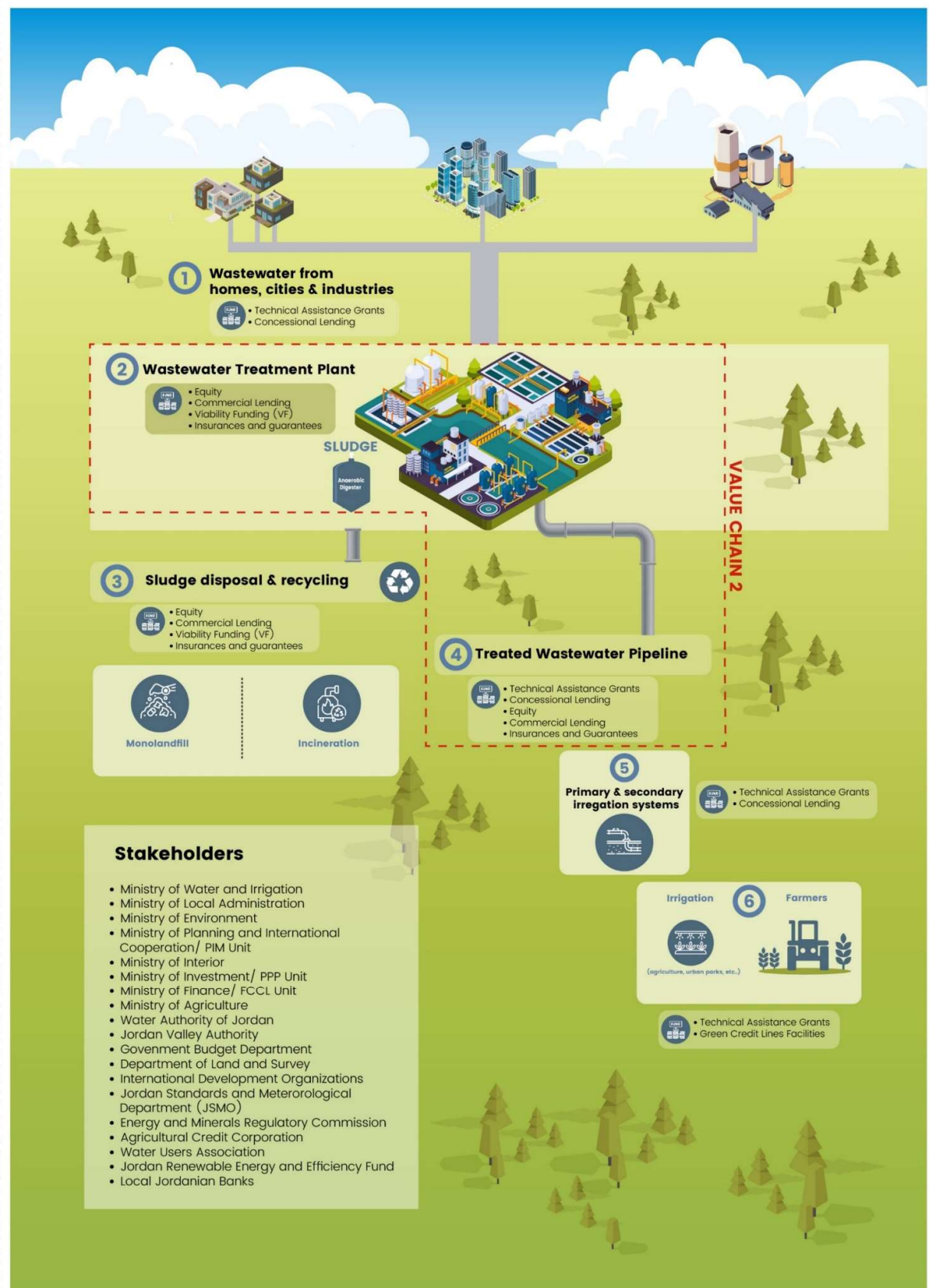


Figure 1: Project 1 and 2 Value Chains

## **Project 3: \_\_Develop and implement a pipeline of projects and policy recommendations to increase the use of aquaponics and hydroponics in urban and rural areas**

### **1. Introduction**

Aquaponics has become a trend. The combination of aquaculture, the practice of fish farming, and hydroponics, the cultivation of plants in water without soil, aquaponics is one example of recirculating systems generally called Integrated Aquaculture Agriculture (IAA). Some integrated farms can reduce water consumption by 90 percent compared to traditional agriculture. In regions of the world where already scarce reserves of water are getting even scarcer, innovative ways of growing food are crucial. Known for heat and deserts, it is not wholly surprising that Jordan is one of these regions.

Jordan has some of the lowest levels of freshwater resources in the world, and these mainly underground, non-renewable stocks are being depleted. In Jordan, agriculture accounts for 55 percent of this use and will likely take the hardest hit in shortages. The consequences on rural livelihoods, economies, and food security could be grave. In this setting, saving water is not only a good practice, but it might also soon have to be the only practice.

Thankfully, innovative methods exist for reducing water use. IAA farms combine new technologies and good practices to reduce agriculture's "water print" and make smart and efficient use of natural resources. In aquaponics, water serves a dual purpose: hosting fish and growing crops, generating two products at once. This isn't the only benefit; the waste from the fish fertilizes the water used to irrigate the plants, and the plants clean the water for the fish. It is a win-win situation. Producing more food with fewer resources is part of the future of agriculture.

In Jordan, like in other countries in this region, water isn't the only challenge; there are also shortages of good-quality soil. IAA is a solution for producing vegetables, fruits, and other food in inhospitable or non-useable lands. It is a great way to provide the country's population with locally-produced foods that give them the protein and minerals they need, but without such intensive water use.

In Jordan, water scarcity is a pressing issue. Integrated Agri-aquaculture farms help to grow food and provide protein in areas where land is non-arable or otherwise inhospitable. Yet, expanding these types of farms takes rethinking and technical knowledge that not all farmers have.

### **2. Water-Agriculture**

With the majority of farmers using tunnel greenhouses that provide limited options for climate control and pest management, the objective of Integrated Agri-aquaculture farms would be to introduce innovative aquaponic and hydroponic farming techniques to local producers for sustainable and efficient agriculture. This approach empowers growers to utilize contemporary practices in water smart technologies to ultimately generate higher quality yields, meet market requirements and compete with regional and international producers. This type of farming increases water use efficiency, limits the use of pesticides, ensures a healthier growth rate and extended production seasons with higher-quality products, and climate control as crops can grow anywhere at any time and no chemical weed products are needed.

In simple terms, hydroponics can be described as growing plants in the absence of soils. There are a number of different variations of hydroponic growing techniques. One of the most common is where the roots of a plant are placed in a water-based, nutrient solution. The roots can be supported by a 'growing medium', such as Rockwool, clay pellets, or sand, however, the nutrition that the plants require to grow all comes from the nutrient solution and not the growing medium.

Some of the known benefits of hydroponic farming are:

- Considerably less water is required than in conventional land-based farming
- No pesticides, fertilizers, or other chemicals are required
- No soil-borne diseases or pests
- Crops will generally grow much faster than they would use conventional farming techniques as they are provided directly with the required nutrients for growth
- Requires less land than conventional land-based farming and can be conducted in a variety of locations
- Requires minimal supervision
- Not restricted by growing seasons

Aquaponics is the process of combining aqua farming and hydroponics in a closed-loop system, the end result of which is the growth of both fish and plants (e.g., lettuce, kale, watercress, and herbs). Although fish is the most common type of aqua farming that takes place using this type of system, other aquatic animals can be used such as snails, crayfish, and prawns. Whilst fish can be harvested from aquaponics systems, the most common type of system is primarily designed for growing plants.

In addition to the benefits associated with hydroponics, aquaponics has the following benefits:

- No need to continually invest in the nutrient solution as the nutrients are all provided by the fish
- Generally, requires less maintenance than a hydroponics system
- Fish can also be harvested.

Through the adoption of hydroponic farming solutions, Jordan's horticulture practices are being transformed to utilize methods suitable for its arid and semi-arid environments will be transformed through the adoption of IAA farms. This farming solution demands lower physical activity which will encourage Jordanians to work in the sector. Also, this new technology will support the creation of new business partnerships to fill the existing gaps in the value chain of the industry. Designing solutions for both production and post-harvest is driven by traditional and new markets and available market windows, farmers' ability to invest, and the capacity of farmers to implement and operate these solutions. This project will directly contribute to the sector's sustainable growth while overcoming the national water shortage challenges (with 40-80 percent potential savings in water usage).

To initiate the activity, the project will need to consult with early adopters' farmers and conduct also a farmers' needs assessment, to develop a technical design of the greenhouse solution in consultation with each grower. Similar to other countries, the development of these greenhouse technologies in Jordan will encompass a wide range of technologies and systems. The project needs to implement configurations and designs of greenhouses in two distinct climate zones: the Jordan Valley and the Highlands. The farm conditions, water quality, and market windows differ in each location, and therefore, they will both require specifically tailored solutions.

### 3. **Policy Implications**

1. Available skilled workforce throughout the production and value chain is critical to expanding high-value farming and increasing opportunities. The knowledge and skills base of Jordan's horticulture sector is a key success factor for developing the sector and supporting the production and post-harvest value chain.
2. Creating and building partnerships that will grow and expand with the development of Integrated Aquaculture Agriculture in Jordan. The objective would be to improve market access for local agriculture producers and work on boosting competition for local agribusinesses. The need to implement comprehensive market assessments and combines international best practices and solutions that empower small agricultural producers to take calculated risks. The project's

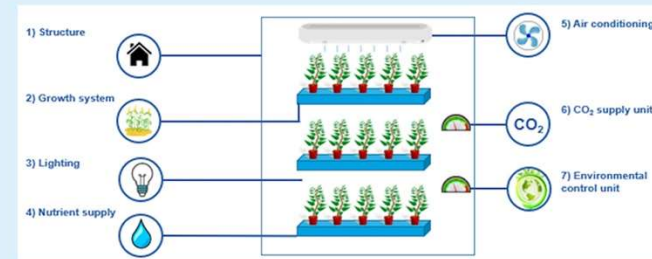
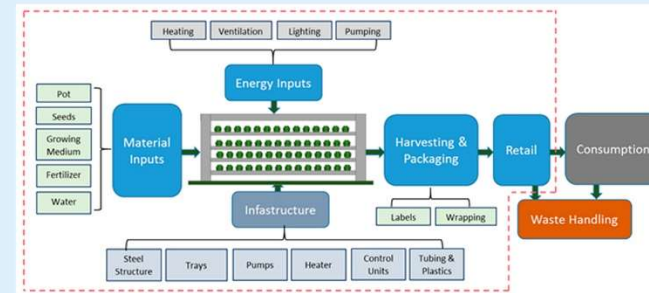
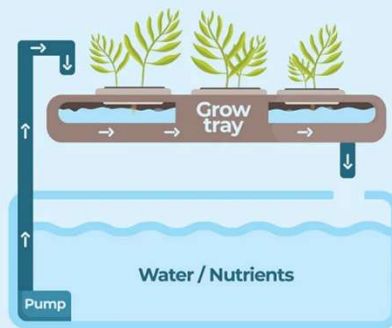
activities will include market development, partnership building, skills, and capacity development to support the advancement of the entire value chain and thereby maximize economic returns and job creation. To support these efforts, the project should collaborate with farmers and exporters to identify market opportunities and drive investments toward production and post-harvest systems thus increasing its market viability.

3. To support the implementation of IAA in Jordan, as well as to remove financial barriers to entry and shift Jordanian farmers to this type of farming, a technical assistance grant would be required. Furthermore, expanding some successful initiatives, such as "The Jordan Hydroponics Agriculture and Employment Development Project (HAEDJo)," which has contributed to the development of a vibrant, prosperous, and efficient horticulture sector that supports Jordan's national economic growth plans. The five-year project, funded by the Netherlands Ministry of Foreign Affairs, aims to advance Jordan's horticultural value chain through the use of innovative hydroponic techniques and improved post-harvest management, all while saving water, improving food security, and creating job opportunities for Jordanians.

## The Aquaponic General Cycle



## Hydroponics



## Stakeholders

- Ministry of Water and Irrigation
- Water Authority of Jordan
- Ministry of Agriculture
- Ministry of Local Administration
- Ministry of Environment
- Ministry of Planning and International Cooperation/ PIM Unit
- Ministry of Investment/ PPP Unit
- Ministry of Finance/ FCCL Unit
- Government Budget Department
- International Development Organizations
- National Agricultural Research Centre
- Agricultural Credit Cooperation
- Farmers Union

Figure 2: Project 3 Value Chain

## **Theme (2): Enhancing energy security through Renewable Energy and Energy Efficiency**

### **Project 4: Renewable Energy and Energy Efficiency in Wellfields and Water Pumping Stations**

#### **1. Introduction**

During the past decades, Jordan has experienced rapid growth in its population, including a significant influx of Syrian refugees. This has inevitably overburdened the limited infrastructure and utility services provided by the Government of Jordan (GoJ). The exponential increase in water demand inherently implies a need for affordable and sustainable energy, hence requiring thorough design of the interdependent water-energy systems and updates to the existing operational management strategies. Depletion of groundwater aquifers – beyond their recharge values – has lowered water tables, and consequently impeded the extraction process leading to increased energy demand.

The water sector is ranked as the largest electricity consumer in Jordan attributing to 15 percent of the entire national consumption. Electricity use increased by 37 percent between 2010 and 2018 due to the commissioning of new water and wastewater infrastructure, primarily to alleviate and mitigate a rise of 21 percent in national demand caused by the influx of refugees from Syria. Furthermore, electricity sector reform had a significant impact on the water sector, as the electricity tariff for water increased by 333 percent between 2010 and 2018. Electricity costs alone accounted for 44 percent of the water sector's total operating expenses in the year 2021.

In light of these circumstances, the water sector has invested efforts to alleviate this issue by preparing the "Energy Efficiency and Renewable Energy Policy" in the year 2016 with the aim of reducing energy consumption by 15 percent, and further expansion of renewable energy coverage to 10 percent of the total energy needs until the year 2035. The Water Authority of Jordan (WAJ) is responsible for the operational management of municipal water and wastewater services, operation and maintenance of water facilities (pumping stations, wellfields, water and wastewater networks, wastewater treatment plants), and supervision of the water companies and levels of service. The Jordan Valley Authority (JVA) is responsible for the operation and maintenance of irrigation networks, regulation to control water use in farms, and shared water resources development.

According to the data provided for 2017, the total amount of energy consumed by WAJ and its subsidiary water companies for the municipal water and wastewater sector was about 1,324 GWh, with a cost of approximately US\$ 300 million. Three water systems constitute 60 percent of the total energy consumption in the water sector (Zai, Wadi Arab,

and Zara Ma'in), the wells and pumping stations need about 33 percent and the wastewater sector requires only 4 percent of the total energy. Table (6) provides a detailed breakdown of the energy consumption per facility type and utility.

**Table 5: Energy consumption per facility type and utility**

Facility Type / Utility	Miyahuna	WAJ	Yarmouk	Aqaba	Total
Wells (MWh)	33,089	75,562	94,819	19,452	222,922
Pumping stations (MWh)	71,161	65,491	80,884	3,639	221,174
Water Treatment Plant (MWh)	9,045	2,165	10,470	712	22,392
WW lifting stations (MWh)		956	558	334	1,847
Wastewater Treatment Plant (MWh)	13,382	3,778	32,820	4,896	54,875
Multiple facilities (MWh)	664,735	14,961	88,593	0	768,290
Unspecified, Admin, Reservoir (MWh)	4753	13,754	13,448	410	32,365
<b>Total (MWh)</b>	<b>796,165</b>	<b>176,667</b>	<b>321,592</b>	<b>29,442</b>	<b>1,323,866</b>

(Source: WAJ, 2018)

## **2. Water-Energy Security Nexus**

This project is comprised of a series of interconnected investment, construction, and operation components packaged into a **distinct value chains**. These activities and investment subprojects aim to supply drinking water to consumption centers while also reducing the amount of electricity consumed. Wells, pumping stations, transmission pipelines, reservoirs, storage tanks, and terminal reservoirs used for distribution to secondary and tertiary supply networks are common components of a typical water supply system. The operation condition of major systems is changing with the passage of time which affects power consumption and energy efficiency. On the wellfield level, huge energy-saving potential is expected through the improvement of higher standards of well rehabilitation and execution of pumping tests, pump inspection and maintenance, and detailed selection of well submersible pumps according to the actual flow and head conditions.

The pumping stations along the transmission system have a huge energy-saving potential through the improvement of the selected high-efficiency pumps that consider the actual

and future operation conditions based on available water quantities and pumping heads. In addition, regular pump inspections and preventative/regular maintenance should be improved and integrated. An important issue in the water sector is the life cycle costs of pumps since they are operated 24 hours 7 days a week continuously therefore the total cost comprising the investment and operation costs within the life span of the pumps – normally 10 years need to be considered.

In addition, and to contribute to reducing the electricity costs in the water sector and reduce GHG emissions, renewable energy projects (Solar PV) should be introduced at different locations in the value chain, with concepts ranging from containerized PV solutions, PVs on rooftops of reservoirs and buildings, and a PV solar plant with storage to partially cover the energy consumption for major wellfields and pump stations.

All of the above would contribute substantially to the implementation of the MWI “Energy Efficiency and Renewable Energy Policy” and reduce the energy consumption in wellfields and pumping stations, fully in line with Jordan’s National Determined Contributions (NDCs) and other climate change policies concerning both adaptation and mitigation agenda.

**Table 6: Proposed project location**

No.	Entity	Governorate	Facility Name	Facility type	GWh	Comments
1	Miyahuna	Balqa	Zai Transmission system	WTS	363.96	5 pump St., IPS, WTP
2	Miyahuna	Balqa	Zara Ma'in transmission system	WTS	226.53	5 pump stations, WTP
3	Yarmouk	Irbid	Wadi Arab transmission system	WTS	82.13	4 PS, WTP, wells
4	Miyahuna	Zarqa	Azraq PS and wells	WTS	31.59	PS and about 16 wells
5	Miyahuna	Madaba	Wala-Lib transmission system	WTS	26.65	2 PS, about 14 wells
6	Yarmouk	Mafrq	Al Aqeb wellfield	Wellfield	20.01	27 wells
7	WAJ	Tafilah	Al Hasa transmission system	WTS	18.55	3 PS and 10 wells
8	WAJ	Karak	Al-Lajjun PS and wells	PS & Wells	18.12	PS and 18 wells
9	WAJ	Karak	Qatraneh PS and wells	PS & Wells	11.07	PS and 20 wells
10	WAJ	Karak	Al-Ghwair PS and wells	PS & Wells	10.48	PS and 4 wells

No.	Entity	Governorate	Facility Name	Facility type	GWh	Comments
11	WAJ	Deir Ala	Abu Al Zighan wells	Wells	10.07	about 18 wells
12	Yarmouk	Mafraq	Al-Zaatari WWTP	WWTP	9.34	Zaatari Camp
14	Miyahuna	Amman	Ain Ghazal PS	PS	9.23	
15	Miyahuna	Zarqa	Hallabat water trans. system	WTS	8.54	Wells and PS
16	Miyahuna	Zarqa	Khaw PS	PS	8.10	
17	Yarmouk	Irbid	Zabdah PS	PS	8.09	
18	Miyahuna	Amman	Dabouq PS	PS	8.08	Nafaq station
19	WAJ	Karak	As-Sultani PS	PS	7.76	PS and 13 wells
20	Miyahuna	Amman	South Amman WWTP	WWTP	7.61	
21	WAJ	Salt	Al Yazidieh PS and wells	PS & Wells	7.41	
22	WAJ	Salt	Shraya Water system	WTP, PS, Wells	6.92	WTP, PS and well
23	Miyahuna	Zarqa	New Zarqa PS	PS	6.59	
24	WAJ	Karak	Muhay PS and wells	PS & Wells	6.28	PS and 14 wells
25	Yarmouk	Jerash	Mashtal Faisal desal. plant	WTP & Wells	5.64	WTP and wells
26	Yarmouk	Mafraq	Sumaya PS	PS	5.61	
27	Yarmouk	Irbid	Hofa PS	PS	4.95	
28	WAJ	Ma'an	Djuthah PS and wells	PS & Wells	4.73	PS and 10 wells
29	Aqaba	Aqaba	North Aqaba WWTP	WWTP	4.70	
30	Yarmouk	Irbid	Dougara WWTP	WWTP	4.47	Wadi Arab WWTP
31	Yarmouk	Irbid	Samad PS	PS	4.36	
32	Miyahuna	Zarqa	Zarqa Desalination plant	WTP	4.19	
<b>Total</b>					<b>958</b>	

### **2.3 Policy Implications:**

Close coordination between the water and energy sector is needed to agree on

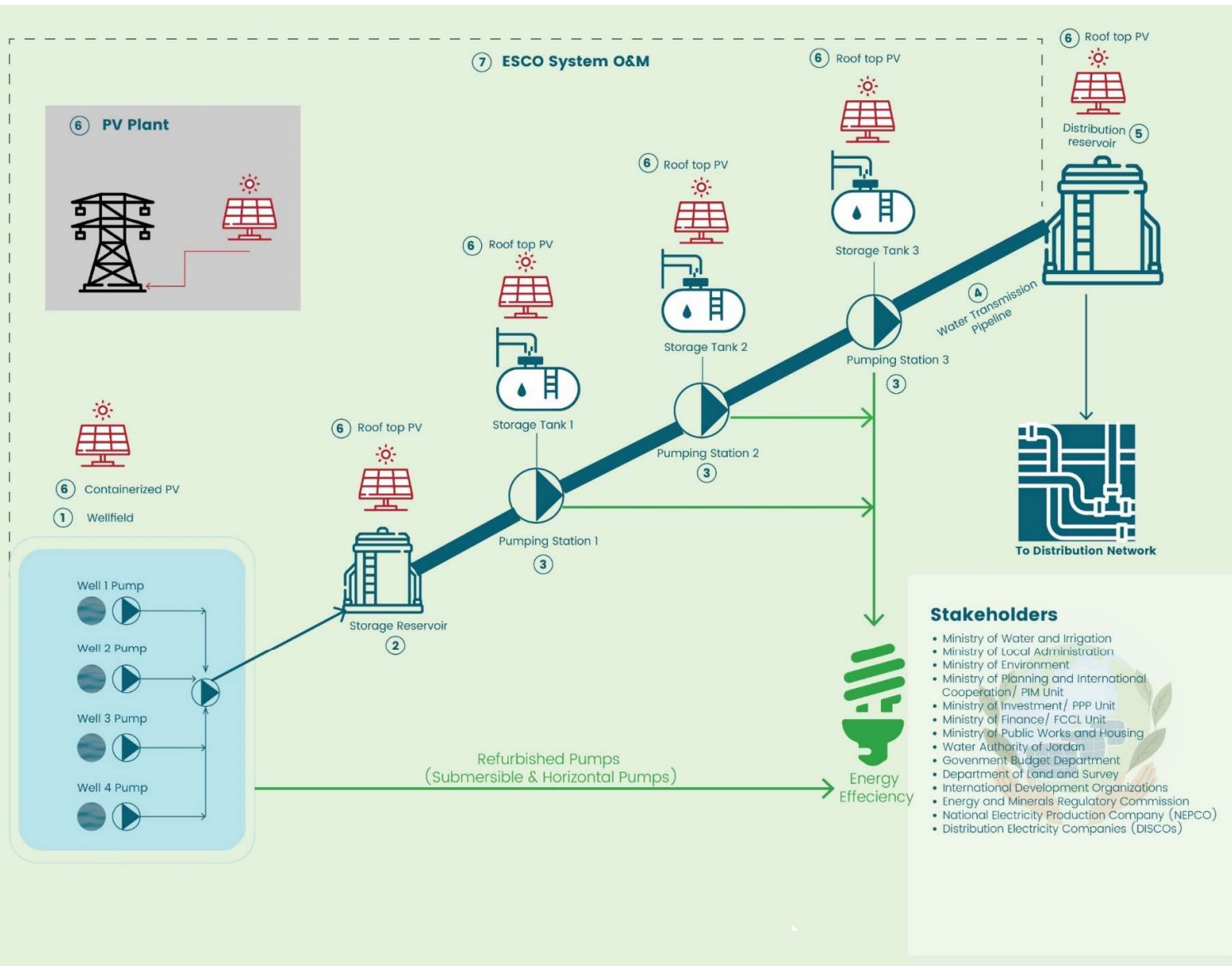
renewable energy projects, capacities, and tariffs. No other major policy modifications over the last few years. However, PPP standard bidding and contract documents, in addition to Performance-based Contracts for Operation and Maintenance, need to be prepared by PPP Unit.

**Table 7: Project (4) Value Chain**

No.	Investment subprojects	Description	Implementation Model	Funding Source	Stakeholders
1.	<b>Water Wellfield</b>	<ul style="list-style-type: none"> <li>▪ Design and drilling of individual water production wells equipped with casing and filter pipes through the level of the aquifer</li> <li>▪ Each well is equipped with a submersible pump including the motor and attached to a riser pipe</li> <li>▪ Sealed well head with a passage for the riser pipe and electric cable system</li> <li>▪ Close to the wellhead is the electric equipment (control panels with switches, PLC, voltage transformers, etc.) in a separate building</li> <li>▪ Riser pipe is connected to the transmission pipe with connections for pressure gauges, non-return valves, control valves, and flow meter</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public Investment Project (PIP)</li> <li>▪ Performance-based Operation and Maintenance and Energy Saving including Operational Investments (Life cycle cost) (Ringfenced Contract to this investment subproject)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Technical assistance grants</li> <li>▪ Concessional Lending</li> <li>▪ Equity</li> <li>▪ Commercial Lending</li> <li>▪ Viability Gap Funding (VGF)</li> <li>▪ Insurances and guarantees</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Water and Irrigation</li> <li>▪ Water Authority of Jordan</li> <li>▪ Ministry of Environment</li> <li>▪ Ministry of Planning and International Cooperation</li> <li>▪ Government Budget Department</li> <li>▪ Department of Land and Survey</li> <li>▪ International Development Organizations</li> <li>▪ Distribution Electricity Companies (DISCOs)</li> </ul>
2.	<b>Storage Reservoir</b>	<ul style="list-style-type: none"> <li>▪ Design and construction of concrete water storage tanks to hold water and store it to ensure that the water system has a constant supply of water and a buffer of water is stored to meet the demand for a defined time in case of water wells disruption</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public Investment Project (PIP)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Technical assistance grants</li> <li>▪ Concessional Lending</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Water and Irrigation</li> <li>▪ Water Authority of Jordan</li> <li>▪ Ministry of Planning and International Cooperation / PIM Unit</li> <li>▪ Ministry of Environment</li> <li>▪ Department of Land and Survey</li> <li>▪ Government Budget Department</li> <li>▪ International Development Organizations</li> </ul>
3.	<b>Pumping Station and Storage Tank</b>	<ul style="list-style-type: none"> <li>▪ Design and construction of pumps with different heads and discharges to match customer demands</li> <li>▪ Design and construction of sub-pumping stations to discharge water in different directions and supply areas</li> <li>▪ Design and install Measuring equipment such as flow meters, pressure gauges, level controls, and electrical meters in the control panel (tension and current) to monitor the performance of the pumps</li> <li>▪ Install Suction and discharge valves</li> <li>▪ Design and construction of storage tanks with fixed geodetic head</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public Investment Project (PIP)</li> <li>▪ Performance-based Operation and Maintenance and Energy Saving including Operational Investments (Life cycle cost) (Ringfenced Contract to this investment subproject)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Technical assistance grants</li> <li>▪ Concessional Lending</li> <li>▪ Equity</li> <li>▪ Commercial Lending</li> <li>▪ Viability Gap Funding (VGF)</li> <li>▪ Insurances and guarantees</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Water and Irrigation</li> <li>▪ Water Authority of Jordan</li> <li>▪ Ministry of Investment / PPP Unit</li> <li>▪ Ministry of Planning and International Cooperation / PIM Unit</li> <li>▪ Ministry of Finance / FCCL Unit</li> <li>▪ Ministry of Environment</li> <li>▪ Department of Land and Survey</li> <li>▪ Government Budget Department</li> <li>▪ International Development Organizations</li> <li>▪ Distribution Electricity Companies (DISCOs)</li> </ul>
4.	<b>Water Transmission Pipeline</b>	<ul style="list-style-type: none"> <li>▪ Design and construction of transmission pipeline(s) to convey large quantities of water from a source of supply to a distribution system. Sizes can range from 16 to more than 200 inches in diameter. Materials include steel, concrete, ductile iron, and fiberglass pipe</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public Investment Project</li> </ul>	<ul style="list-style-type: none"> <li>▪ Concessional Lending</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Water and Irrigation</li> <li>▪ Water Authority of Jordan</li> <li>▪ Ministry of Planning and International Cooperation / PIM Unit</li> <li>▪ Ministry of Environment</li> </ul>

No.	Investment subprojects	Description	Implementation Model	Funding Source	Stakeholders
					<ul style="list-style-type: none"> <li>Ministry of Public Works and Housing</li> <li>Ministry of Local Administration</li> <li>Department of Land and Survey</li> <li>Government Budget Department</li> <li>International Development Organizations</li> </ul>
5.	Distribution Reservoir	<ul style="list-style-type: none"> <li>Design and construction of concrete water storage tanks to hold and store water in order to ensure that the downstream water distribution system has a constant supply of water, and a buffer of water is stored to meet the demand for a set period of time in the event of a supply disruption</li> </ul>	Public Investment Project	Concessional Lending	<ul style="list-style-type: none"> <li>Ministry of Water and Irrigation</li> <li>Water Authority of Jordan</li> <li>Ministry of Planning and International Cooperation / PIM Unit</li> <li>Ministry of Environment</li> <li>Ministry of Public Works and Housing</li> <li>Ministry of Local Administration</li> <li>Department of Land and Survey</li> <li>Government Budget Department</li> <li>International Development Organizations</li> </ul>
6.	PV Renewable Plants and Installations	<ul style="list-style-type: none"> <li>Design and construction of a PV plant with battery storage to cover partially the energy consumption in the water system</li> <li>Design and construction of a PV plant to improve the reliability of pumping operations in wellfields and pumping stations with frequent power cuts</li> <li>Design and construct small and medium PV panels on the largest rooftop reservoirs to be connected on a net-metering scheme to cover local consumption</li> <li>Implementation of small-scale containerized PV systems close to individual wells and connected to the pump with remote monitoring and communication systems</li> </ul>	Public Private Partnership (PPP)	<ul style="list-style-type: none"> <li>Equity</li> <li>Commercial Lending</li> <li>Insurances and guarantees</li> </ul>	<ul style="list-style-type: none"> <li>Ministry of Water and Irrigation</li> <li>Water Authority of Jordan</li> <li>Ministry of Investment / PPP Unit</li> <li>Ministry of Planning and International Cooperation / PIM Unit</li> <li>Ministry of Finance / FCCL Unit</li> <li>Ministry of Environment</li> <li>Department of Land and Survey</li> <li>Government Budget Department</li> <li>National Electricity Production Company (NEPCO)</li> <li>Distribution Electricity Companies (DISCOs)</li> <li>Energy and Minerals Regulatory Commission</li> </ul>
7.	Operation and Maintenance of the whole value chain (ESCO) applied to a full water supply system	<ul style="list-style-type: none"> <li>An ESCO is a company that offers energy services which may include implementing energy-efficiency projects and also renewable energy projects on a turn-key basis. The three main characteristics of an ESCO are: <ul style="list-style-type: none"> <li>ESCOs guarantee energy savings and/or provision of the same level of energy service at a lower cost. A performance guarantee can take several forms. It can revolve around the actual flow of energy savings from a project, can stipulate that the energy savings will be sufficient to repay monthly debt service costs, or that the same level of energy service is provided for less money</li> <li>The remuneration of ESCOs is directly tied to the energy savings achieved</li> <li>ESCOs can finance, or assist in arranging financing for the operation of an energy system by providing a savings guarantee</li> </ul> </li> </ul>	Public Private Partnership (PPP)	<ul style="list-style-type: none"> <li>Equity</li> <li>Commercial Lending</li> <li>Insurances and guarantees</li> </ul>	<ul style="list-style-type: none"> <li>Ministry of Water and Irrigation</li> <li>Water Authority of Jordan</li> <li>Ministry of Investment / PPP Unit</li> <li>Ministry of Planning and International Cooperation / PIM Unit</li> <li>Ministry of Finance / FCCL Unit</li> <li>Ministry of Environment</li> <li>Department of Land and Survey</li> <li>Government Budget Department</li> <li>National Electricity Production Company (NEPCO)</li> <li>Distribution Electricity Companies (DISCOs)</li> <li>Energy and Minerals Regulatory Commission</li> </ul>





**Figure 3: Project 4 Value Chain**

## **Project 5: Energy Efficiency and Green Buildings Retrofits in Public Buildings – Phase 1**

### **1. Introduction**

Jordan faces significant challenges in its sustainable development including ensuring its energy supply, as it has limited indigenous energy resources. The country relies on foreign resources, importing 96 percent of its gas and oil from its neighbors. The dominance of oil and gas as primary sources of energy in the country needs to be addressed urgently, as the building sector has a high energy consumption, and plans for alternative power generation have high initial costs. Jordanian residential building sector relies on the fuel for heating, and space heating accounts for around 61 percent of overall energy consumption, making the achievement of energy efficiency very significant in buildings, as they offer enormous scope for energy savings. Energy efficiency has been given a significant amount of attention in the Jordan Green Building Guide, i.e., the local green building rating system. The existing building stock is 80 times larger than the new construction sector. Therefore, from an economic point of view, retrofitting existing buildings is more feasible than constructing new green ones. A transformation of the built environment in Jordan through a sustainable approach is an effective approach to conserving energy, water, and other resources. Regular buildings are characterized by three major characteristics, which are the drain of energy and resources, pollution of the environment through emissions and fumes, liquid or solid waste, and the negative impact on the health of the users of buildings as a result of the use of different chemicals and other pollutants.

Green building – also known as sustainable building – is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life cycle. In other words, green buildings are designed to reduce their negative impact on human health and the environment through:

- Efficiently using energy, water, and other resources;
- Protecting occupant health and improving employee productivity; and
- Reducing waste, pollution, and environmental degradation.

This means that sustainable construction practices don't actually stop at the construction stage. Sustainable buildings should also try to be environmentally friendly in their day-to-day operations, maintenance, and even demolition.

### **2. Green Building**

Reducing water consumption and protecting water quality is one of the main objectives in sustainable construction, the critical issue of water consumption in many parts of the

country is increasing demand for groundwater beyond the ability to regenerate itself, as a result, the facilities must increase dependence on water which is collected, used and purified, and reused on-site to the maximum extent possible, also the water can be protected and conserved during the life of the building through the work of the dual plumbing that re-circulating water in the toilet to clean design, as well as the water waste can be reduced to a minimum by taking advantage of plumbing water conservation equipment such as reduced flow toilets and reducing the speed and volume of water flow from the shower

Energy efficiency is one of the most important factors in green building design, starting from the careful selection of windows, good insulation to maintain the temperature of the air, isolated air-conditioning pipes, the correct position of the insulation of steam and air and the use of clean energy in heating and cooling lead to the conservation of energy in the building. The use of renewable energy, such as solar energy or vital energy to meet the energy needs significantly can reduce the carbon footprint of these buildings. Buildings can save on energy usage (and costs) by utilizing as much natural light as possible. This also helps keep buildings warm during cold weather. Some buildings also power themselves using renewable energy by installing commercial solar panels.

One way to achieve sustainable construction is to use fewer raw materials or sustainable materials like recycled glass and steel. Also, more durable options would delay the need for purchasing or producing replacements. Finally, using non-toxic paints and materials avoid the health problems like respiratory complications that can be caused by toxic materials.

Buildings can also reduce waste in their day-to-day operations. This includes collecting, separating, and recycling waste by both tenants and operators. Additionally, building owners can also reduce waste on a larger scale by recycling construction debris to reduce the amount of waste going to landfills.

Indoor environmental quality refers to the quality of a building's environment related to the health of occupants within it and is determined by many factors, including lighting, air quality, and damp conditions.

### 3. **Policy Implications**

Major policy modifications need to be implemented to roll out the implementation of this project. These policy measures include the following:

- **Create defined energy and water regulatory policies:** Create strong, enforceable legal standards to underpin change; in particular: a. Mandatory standards and codes regarding water and energy efficiency, M&V, and audits; to be developed by engaging relevant stakeholders. b. Mandatory labels and certificates. c. Introduction of benchmarking rating systems and improvement of existing ones.
  
- **Efficiency assessment:** Assessing the energy and water efficiency of an existing building is an intricate task, as it requires accurate and reliable monitoring and auditing, and proper benchmarking and certification schemes. An efficient metering policy would be the first step towards a proper national-level public buildings efficiency assessment. Smart meters would help to identify the best ad-hoc retrofit option. In addition, if energy/water data for several buildings were collected, it would help with benchmarking and designing national energy/water efficiency policies.
  
- **Selection of retrofit options and risk assessment:** A large number of different retrofit options are available for energy and water efficiency, and therefore identifying the most suitable option for a specific building can be quite challenging. Often, the 'low-hanging fruit' options (e.g., LED lights, window sealing, taps, aerators) represent relatively inexpensive and quite effective solutions. However, for more extensive retrofits (e.g., Heating, Ventilation, and Air Conditioning (HVAC) systems or hot water system replacement), rigorous monitoring and auditing activities are necessary to identify the best retrofit option. While ranking different options, it would be beneficial to account for co-benefits, such as increased tenants' productivity, reduced carbon emissions, or increased property value, which could increase the project's attractiveness; however, these may be difficult to quantify and compare in monetary terms. Adding to the complexity, there are a number of uncertainties (e.g., future energy/water price, climate change, equipment performance), increasing the risks for the building owner. The associated risks in a retrofitting project can be minimized by following a systematic risk assessment and management framework from a project life-cycle perspective.
  
- **Procurement methods:** Traditional procurement methods are generally ineffective because government agencies seek funding from the central government for retrofitting projects and funding options are rarely provided. An effective procurement option can be provided by 'Integrated Services Models', whereby a qualified service provider (for energy efficiency, called an Energy Service Company or ESCO) is selected for not only the retrofit installation but also pre-

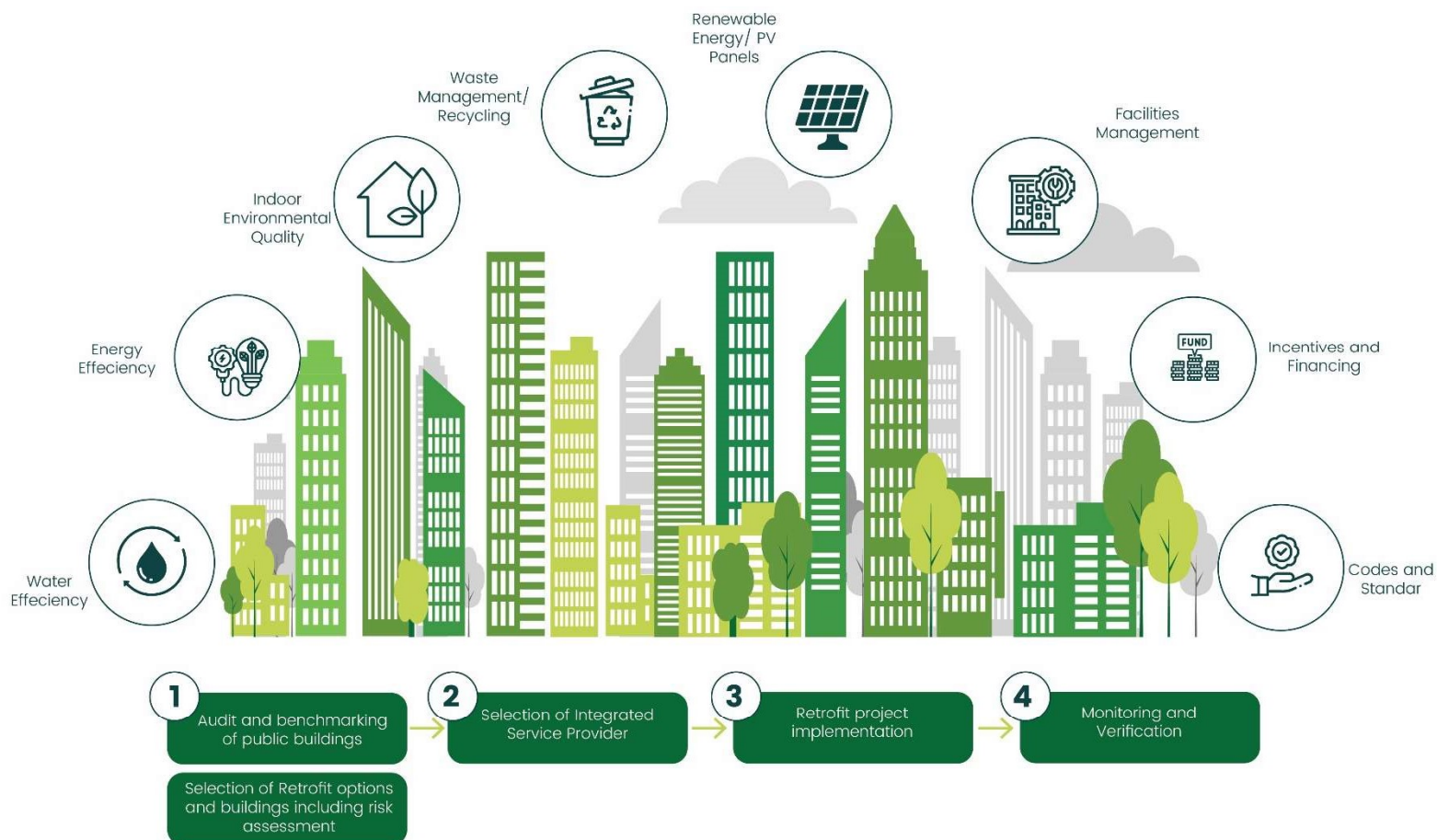
retrofit auditing, project proposal, and post-retrofit measurement and verification (M&V). In the case of an Energy Performance Contract (EPC), the whole process is performance-driven, as the ESCO will not be paid upfront but will get paid through a proportion of the achieved energy savings. In this way, it is important for ESCOs to accurately predict the savings and monitor them to achieve positive returns on investment. This procurement method also transfers risks away from the owner, who does not require in-depth technical knowledge.

- **Government implementation of retrofit program awareness-raising and capacity-building initiatives:** the government needs to invest in general public information campaigns and specific professional training. The potential for insurers to enter this market must be explored.
- **Development of enhanced retrofit guidelines:** implemented practices need to enable assessments that can better incorporate input parameter uncertainty, noneconomic benefits, and predictive maintenance for optimized timing of these interventions: M&V should be extended to monitor factors leading to the quantification of non-monetary benefits.
- **Project financing mechanism:** Utilization of an appropriate financing mechanism is critical to overcome the financing-related barriers and ensure proper implementation of a retrofitting project. Implement financing schemes combined with energy/water savings insurance mechanisms: a revolving loan scheme whereby ESCOs can easily obtain low-interest loans, combined with mandatory training and certifications of professionals, seems to be a winning strategy as it carries a low risk for the owner, who can also avoid high capital investments, and would lead to a quality-oriented scheme with qualified people seeking state-of-the-art retrofit work to maximize their earnings. However, some other minor financial schemes should be developed to create a dynamic, versatile financing environment.

No.	Action	Description	Implementation Model	Funding Source	Stakeholders
1.	<b>Audit and benchmarking of public buildings including a selection of retrofit options and risk assessment</b>	<ul style="list-style-type: none"> <li>An audit is an inspection survey and an analysis of energy and water flows for conservation in a building. It may include a process or system to reduce the amount of input into the system without negatively affecting the output. It is the first step in identifying opportunities to reduce expenses and carbon footprint.</li> </ul>	<ul style="list-style-type: none"> <li>Public Investment Project (PIP)</li> </ul>	<ul style="list-style-type: none"> <li>Technical assistance grants</li> <li>Green Credit Line Facility SMEs</li> </ul>	<ul style="list-style-type: none"> <li>Ministry of Public Works and Housing</li> <li>Ministry of Energy and Mineral Resources</li> <li>Energy and Mineral Resources Regulatory Commission</li> <li>Distribution Electricity Companies (DISCOs)</li> <li>Greater Amman Municipality</li> <li>Ministry of Environment</li> <li>Ministry of Water and Irrigation</li> <li>Ministry of Planning and International Cooperation</li> <li>Ministry of Finance</li> <li>Government Budget Department</li> <li>Department of Land and Survey</li> <li>Ministry of Education</li> <li>Ministry of Health</li> </ul>
2.	<b>Selection of an Integrated Services Provider for retrofit installation (ESCO)</b>	<ul style="list-style-type: none"> <li>An ESCO is a company that offers services that may include implementing energy efficiency, water efficiency, waste recycling projects, and also renewable energy projects on a turn-key basis. The three main characteristics of an ESCO are: <ul style="list-style-type: none"> <li>ESCOs guarantee water and energy savings and waste reduction.</li> <li>The remuneration of ESCOs is directly tied to the savings achieved</li> <li>ESCOs can finance, or assist in arranging financing for the operation of a system by providing a savings guarantee</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Public Private Partnership (PPP)</li> </ul>	<ul style="list-style-type: none"> <li>Concessional Lending</li> <li>Equity</li> <li>Commercial Lending</li> <li>Green Credit Line Facility SMEs</li> </ul>	<ul style="list-style-type: none"> <li>Ministry of Public Works and Housing</li> <li>Ministry of Planning and International Cooperation / PIM Unit</li> <li>Ministry of Finance / FCCL Unit</li> <li>Ministry of Investment / PPP Unit</li> <li>Ministry of Energy and Mineral Resources</li> <li>Energy and Mineral Resources Regulatory Commission</li> <li>Distribution Electricity Companies (DISCOs)</li> </ul>
3.	<b>Retrofit project implementation</b>	<ul style="list-style-type: none"> <li>An overview of potential retrofit actions that may improve performance figures can be categorized into three main strategies: (1) actions regarding building envelope and design aspects including insulation upgrades, air leakage reduction, improvement of doors and windows, control and exploitation of solar gain and daylight, water usage and waste recycling (2) actions for building systems and installations including installation of high-effectively HVAC systems, improvement of electrical lighting systems, improvement of domestic appliances, installation of renewable energy (3) actions associated with building services and management tools including monitor and control of building during operation, utilization of metering services, clock controls, sensors, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Public Private Partnership (PPP) – ESCO</li> </ul>	<ul style="list-style-type: none"> <li>Equity</li> <li>Commercial Lending</li> <li>Viability Gap Funding (VGF)</li> <li>Insurances and guarantees</li> <li>Green Credit Line Facility SMEs</li> </ul>	<ul style="list-style-type: none"> <li>Ministry of Public Works and Housing</li> <li>Ministry of Planning and International Cooperation / PIM Unit</li> <li>Ministry of Finance / FCCL Unit</li> <li>Ministry of Investment / PPP Unit</li> <li>Ministry of Energy and Mineral Resources</li> <li>Energy and Mineral Resources Regulatory Commission</li> <li>Distribution Electricity Companies (DISCOs)</li> </ul>
4.	<b>Monitoring and verification</b>	<ul style="list-style-type: none"> <li>The development of standard procedures for measurement and verification (M&amp;V) of savings is an important task for the promotion of the ESCO business. Good measurement practices and verifiability are some of the important elements in providing the confidence needed to secure funding for projects. Securing financing</li> </ul>	<ul style="list-style-type: none"> <li>Public-Private Partnership (PPP)</li> </ul>	<ul style="list-style-type: none"> <li>Equity</li> <li>Commercial Lending</li> <li>Insurances and guarantees</li> </ul>	<ul style="list-style-type: none"> <li>Ministry of Public Works and Housing</li> <li>Ministry of Planning and International Cooperation / PIM Unit</li> <li>Ministry of Finance / FCCL Unit</li> <li>Ministry of Investment / PPP Unit</li> <li>Ministry of Energy and Mineral Resources</li> </ul>

		requires confidence that energy efficiency investments will result in a savings stream sufficient to make debt payments. Measurement and verification practices allow project performance risks to be understood, managed and allocated among the parties.			<ul style="list-style-type: none"> <li>▪ Energy and Mineral Resources Regulatory Commission</li> <li>▪ Distribution Electricity Companies (DISCOs)Local Financing Institutions</li> <li>▪ Ministry of Investment / PPP Unit</li> </ul>
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**Table 8: Project 5 Value Chain**



## Stakeholders

- Ministry of Public Works and Housing
- Ministry of Water and Irrigation
- Ministry of Education
- Ministry of Health
- Ministry of Energy and Mineral Resources
- Energy and Mineral Resources Commission
- Ministry of Environment

- Ministry of Planning and International Cooperation/ PIM Unit
- Ministry of Investment/ PPP Unit
- Ministry of Finance/ FCCL Unit
- Ministry of Local Administration
- Ministry of Environment
- Water Authority of Jordan

- Government Budget Department
- Greater Amman Municipality
- Department of Land and Survey
- International Development Organizations
- National Electricity Production Company (NEPCO)
- Distribution Electricity Companies (DISCOs)

**Figure 4: Project 5 Value Chain**

### **Theme (3): Protect natural environment and create rural jobs**

#### **Project 6 and 7: Support rural green growth and employment through ecosystem restoration and Management and harvesting of rainwater by farmers in rural areas, for improved water storage and reduced soil erosion**

##### **1. Introduction**

Afforestation and reforestation are key facets of climate change mitigation. Afforestation is the planting of trees or forest cover on land which historically did not contain forests, while reforestation is the planting of trees or forest cover on land which previously contained forest that was converted to another land use. Both afforestation and reforestation are aspects of a larger portfolio of sustainable land management policies that aim to combat desertification, restore degraded soil, conserve biological diversity, and ultimately mitigate climate change.

Sustainable land management is vital for countries like Jordan, which faces severe threats from climate change while remaining reliant on agriculture. The degradation of Jordan's natural ecosystems has occurred as farmers and shepherds race to use the nation's limited resources in a tragedy of the commons. Although reforestation can pit farmers and policymakers on opposing sides by placing limits on grazing and farming, the Jordanian government has pursued a unique arrangement to begin reforesting swaths of the Jordan Valley. As early successes in reforestation demonstrate longevity and potential for expansion, governments in water-parched regions should heed this collaborative model of ecological restoration. Recognizing the severe risks stemming from climate change, the Jordanian government featured reforestation as a key component in its 2021 National Climate Change Adaptation Plan.

Jordan has a land area of about 90,000 km<sup>2</sup> and is divided into three geographic zones: the Jordan valley, the highlands, and the rangeland zone. Approximately 90 percent of Jordan's entire area is covered by rangelands, which receive less than 200 mm of annual rainfall. This area is locally known as the Badia and is home to the Bedouins, who primarily rely on livestock to provide food and income. Before the 1960s, the Badia remained in a balance between the eroding forces of wind and water and the ecosystem's resilience potential. The rangeland ecosystem baseline state can be therefore considered sustainable, at least at the medium to long-term timescale. Since 1960, Jordan's government has initiated programs to settle the nomadic Bedouin herders using irrigated agriculture and subsidy systems. The low and erratic rainfall, frequent droughts, high population growth rate, and unsuitable land management practices have caused

extensive land degradation and exploited vegetation forcing farmers and herders to cultivate barley as livestock fodder to meet grazing needs. The degradation of vegetation leads to soil crusting, rainwater retention, and infiltration change which promotes surface runoff and soil erosion that impose risks on pastoral systems.

Changes in the lifestyles of local communities and the adoption of sedentary farming systems have resulted in ploughing of rangelands to establish private property and ownership rights, the uprooting of bushes for use as fuel wood, and the arbitrary movement of vehicles. Government seizure of the land has further exacerbated the situation, resulting in overgrazing, early grazing of rangeland and continued desertification of the Badia. Forced migration, ill-management of pasturelands, increased livestock herd, and drought have also resulted in land degradation, further compounding the challenges faced by nomadic communities in Jordan.

Therefore, actions to halt degradation and restore the ecosystems are needed, supported by environmental and rangeland strategies that aim to control and reverse rangeland degradation.

## **2. Ecosystem Value Chain**

The Ministry of Environment recognizes the importance of intact ecosystems and their ecosystem services, including the multiple and complex interactions between water, soils, plants, animals, and humans that are essential for the economy, nutrition, and people's livelihoods.

One initiative to restore degraded rangeland is the construction of water harvesting and storage measures combined with the planting of native shrubs species. A water harvesting structure concentrates surface runoff in well-defined target areas (pits, furrows, ponds) to enhance local water storage and consequently overcome water shortage during dry spells. Furthermore, the implementation of water harvesting along a terrain's contours intersects the flow path of the surface runoff and mitigates the effects of accumulated surface runoff, erosion, and sediment yield from the catchment. Understanding the interaction between water, soil and vegetation will allow better land degradation assessments and can help to evaluate the impacts of restoration practices on land degradation reduction and improving rangeland conditions.

Reseeding helps to initiate and speed up the process of regeneration, and is essential in recolonizing severely degraded sites with native species that have been removed by disc ploughing and/or overgrazing. Reseeding large areas requires vast quantities of seeds. Since reseeded on such a large scale had not been attempted before, the challenge will be to produce enough seeds, especially for the perennial shrubs. Seed production farm units need to be established and operated by labor from the local community.

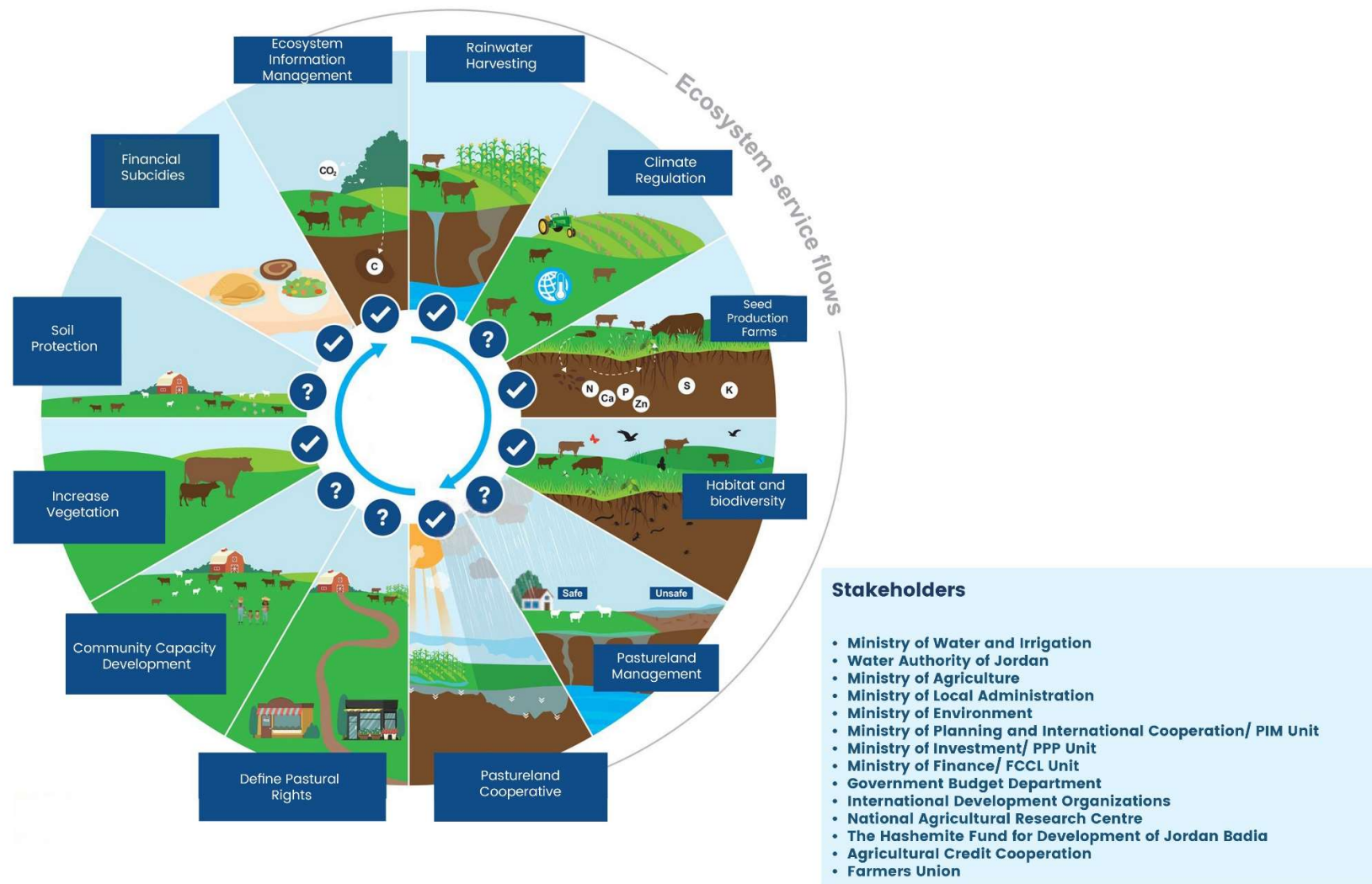
Pastoralism is a significant cultural and economic practice in the Badia, thus in the past, local nomads have developed and used pastureland management systems such as Hima. The hima system is a controlled pastureland use and conservation system that allows for balanced grazing. The essence of hima is to prevent overgrazing by seeking good forage within a tribe's territory while heavily grazed land is allowed to lie fallow and recover. Hima is protected by Bedouin customary tribal law. Under hima, Jordan's pastureland, traditional land tenure systems, and grazing rights were prescribed and upheld by tribal institutions. Reinstitution of the hima is needed to ensure benefits for local communities.

### 3. **Policy Implications**

Governments should defer pastureland management to the local communities. Without effective local control over rangeland resources, there is little incentive for nomadic tribes and local communities to accept assistance from the government, management recommendations or technological interventions that increase resource productivity. Policy makers should take into account different possible methods of resource management: (1) Establishment of pastoral cooperatives; (2) Definition of pastoral rights; (3) Reintroduction of traditional pastureland management systems such as hima; and (4) Community capacity development.

**Table 9: Project 6, 7 Value Chain**

No.	Investment subprojects	Description	Implementation Model	Funding Source	Stakeholders
1.	<b>Rainwater harvesting (Hafir or desert pond)</b>	<ul style="list-style-type: none"> <li>▪ The hafir is a form of floodwater harvesting and depends on flowing water in the wadi to fill, and when the wadi retreats the hafir is full and it remains behind. The hafir size is usually between 100,000 m3 to 300,000 m3 with depth varying between 3 to 5 meters. The exact dimension will vary depending on the land conditions</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public Investment Project (PIP)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Technical assistance grants</li> <li>▪ Concessional Lending</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Water and Irrigation</li> <li>▪ Ministry of Agriculture</li> <li>▪ Ministry of Environment</li> <li>▪ Ministry of Planning and International Cooperation</li> <li>▪ Government Budget Department</li> <li>▪ International Development Organizations</li> </ul>
2.	<b>Seed production farms</b>	<ul style="list-style-type: none"> <li>▪ There are three main approaches for supplying native seeds for restoration projects: (1) seed collection from natural/wild populations, (2) harvest from managed populations, and (3) cultivated seed production systems (such as native seed farms)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public Investment Project (PIP)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Technical assistance grants</li> <li>▪ Concessional Lending</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Agriculture</li> <li>▪ National Agricultural Research Centre</li> <li>▪ Ministry of Planning and International Cooperation</li> <li>▪ Ministry of Environment</li> <li>▪ Ministry of Water and Irrigation</li> </ul>
3.	<b>Pastureland management</b>	<ul style="list-style-type: none"> <li>▪ Pasture management is an exercise for cattle production, offering the animals with forage grasses and legumes and keeping the soil healthy. It defines techniques to enhance grass fitness and forage manufacturing, hold a healthful ecosystem, and decrease manufacturing costs. Success relies upon understanding how all of the factors are interconnected</li> <li>▪ Pasture management is fundamental to grazing due to the fact cattle productiveness in the course of the season relies upon pasture efficiency. It relies upon many factors: quality and amount of forage, grazing, natural conditions, etc. Competent pasture control structures assist to optimize the complicated process</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public Investment Project (PIP)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Technical assistance grants</li> <li>▪ Concessional Lending</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Water and Irrigation</li> <li>▪ Ministry of Agriculture</li> <li>▪ Ministry of Environment</li> <li>▪ Ministry of Planning and International Cooperation</li> <li>▪ Government Budget Department</li> <li>▪ International Development Organizations</li> <li>▪ The Hashemite Fund for Development of Jordan Badia</li> <li>▪ Agricultural Credit Corporation</li> <li>▪ Farmers Union</li> </ul>



**Figure 5: Projects 6 and 7 Value Chain**

## **Theme (4): Improving mobility through Smart and efficient Transportation**

### **Projects 8, 9 and 10: Implement Electric Vehicle (EV) Charging Stations and Service Provision in Greater Amman Municipality (GAM), Intelligent Transport Systems (ITS) in Jordan and Electric Bus Fleet in Amman, Karak, Ma'an, and Tafileh for Use in Public Transport and Government Fleet – Phase 1**

#### **1. Introduction**

Transport is widely recognized as a prerequisite for sound economic development, as it drives competitiveness, growth, and job creation. It provides access and mobility to employment and education, allows for the import and export of goods, and connects the resource base with the demand base. In Jordan, transport is considered a key enabler and driver for the Jordanian economy and represents one of its most important competitive factors.

However, the transport sector in Jordan, specifically the urban transport system (roads and public transport), has been worsening due to the increased demand for travel resulting from several factors, including an outburst in population, the massive and sudden influx of Syrian refugees, and the concentration of population in major urban areas. All of this is exacerbated by the car-dominant culture in the country, which has led to an exhausted sector and, unsustainable mobility patterns in the country.

The transport sector in Jordan is the second key emitter of GHGs in Jordan and accounted for 28 percent of the total GHG emissions in the year 2021. In addition, it is the largest energy consumer with a share of 49 percent, however, it is a primary infrastructure and service sector required to drive the wheel for growth for other economic sectors. The long-term national transport strategy states that the promotion of alternative fuel and vehicles should be taken into consideration. The Ministry of Energy and Mineral Resources 2030 strategy mentions for key priority project and policy priorities for E-mobility which are: 1) EV charging stations establishment, 2) incentives to encourage EVs, 3) increasing EVs in public sector fleets, and 4) increasing investment in electric public transport vehicles.

Several measures have been identified to achieve the 2021 Updated NDC targets which are as follows:

- Intelligent Transport Systems (ITS): This project involves integrating information and communication technologies into transportation in order to increase the efficiency of the system. This includes installing CCTV surveillance systems,

electronic tracking and electronic payment systems, and Electric Vehicle (EV) charging devices. Daily monitoring and maintenance are also important aspects of the project and will deliver improved congestion and reduced journey times.

- Public Electric Bus Fleet: This project aims to provide new bus services with new buses with the latest design, which are reliable, accessible, efficient and safe, and electric.
- Promoting hybrid and electric vehicles at the national level including public fleet and private cars.

## **2. Low carbon and resilient urbanization**

The transport sector is a significant contributor to economic development and is increasingly linked with the energy sector, which has promoted an era of disruption ignited by emerging transport technologies and changing stakeholders' requirements. As Jordan pursues the transition towards a sustainable, efficient, and effective transportation sector, the accompanying successful delivery of future transport services will be driven by three main disruptors: (1) Electrification, (2) Connectivity through digitalization, and (3) Shifting and managing transport demand. To harness the three disruptors, three main pillars need to be considered which consist of a series of interlinked and coherent investment subprojects and policy actions that could be packaged into **a value chain** with significant value added.

- Innovative business models – including policymakers, utility companies, consumers, and the private sector, particularly gas stations, commercial centers, telecommunication providers, and car dealers – will be essential to meet the demands of a transition to electric mobility. The large-scale integration of EVs into the transport and energy systems requires innovation in energy supply models and pricing schemes, as well as infrastructure for charging, to encourage uptake and meet consumer demands.
- Intelligence in electric mobility encompasses intelligence in vehicle operations, electric power infrastructure, and grid integration. The application of advanced technologies and datasets shall include the digitalization of public transport information through online information platforms (ITS) and services such as payment systems, route scheduling, and personal travel planning.
- For the transition of public and private surface transportation, appropriately tailored financing packages must be made available by local commercial and development financing institutions. The application of innovative business models and financing mechanisms will enable technology and infrastructure deployment.

### **Proposed project location:**

The project will be implemented in Greater Amman and the Southern Governorates in Jordan (Karak, Ma'an, and Tafileh) as per the following proposal:

1. Intelligent Transport System (ITS)  
Design, installation, and operation to initially serve the three Southern Governorates and later interface with the existing ITS in Greater Amman on a trial basis. Furthermore, the ITS in Greater Amman will be expanded to include all public and private vehicles in Amman, not just Amman Vision buses.
2. Replace public and government bus fleets in the Southern Governorates and Greater Amman with E-buses.
3. Install EV charging stations in the Southern Governorates and Greater Amman.

### **3. Policy Implications**

Major policy modifications need to be implemented to roll out the implementation of this project. These policy measures include the following:

- Among the challenges that have hindered improvements in public transport is the system's fragmentation, with approximately 85 percent of the Kingdom's public transport fleet being individually owned and operated. This necessitates the consolidation of the ownership of public transport buses (approx. 4,965 inner 2,777 and intercity 2,188) into a number of operators and reduces individual ownership over the next years
- In the current mode of operation, individual transport operators have a license for a specific route and provide services on this particular route without any imposed service standards
- The transport regulator sets fare levels and route alignments. Operators provide the service and keep the fare revenue. Under this scheme, operators decide on their schedules and sometimes adapt the routes to maximize their revenues and balance their operation costs. As a result, many operators often choose to wait at bus terminals until their vehicles are full, rather than operate on a fixed schedule
- Define mandate and responsibility for approval of installing electric charging stations and statutory requirements (technical specifications, site schematic, electricity connection and safety measures) including setting purchase and retail prices of electricity
- Replacing old public transportation buses with new EVs would need to be accompanied by a financial incentive scheme and regulatory changes to ease acceptance and rollout

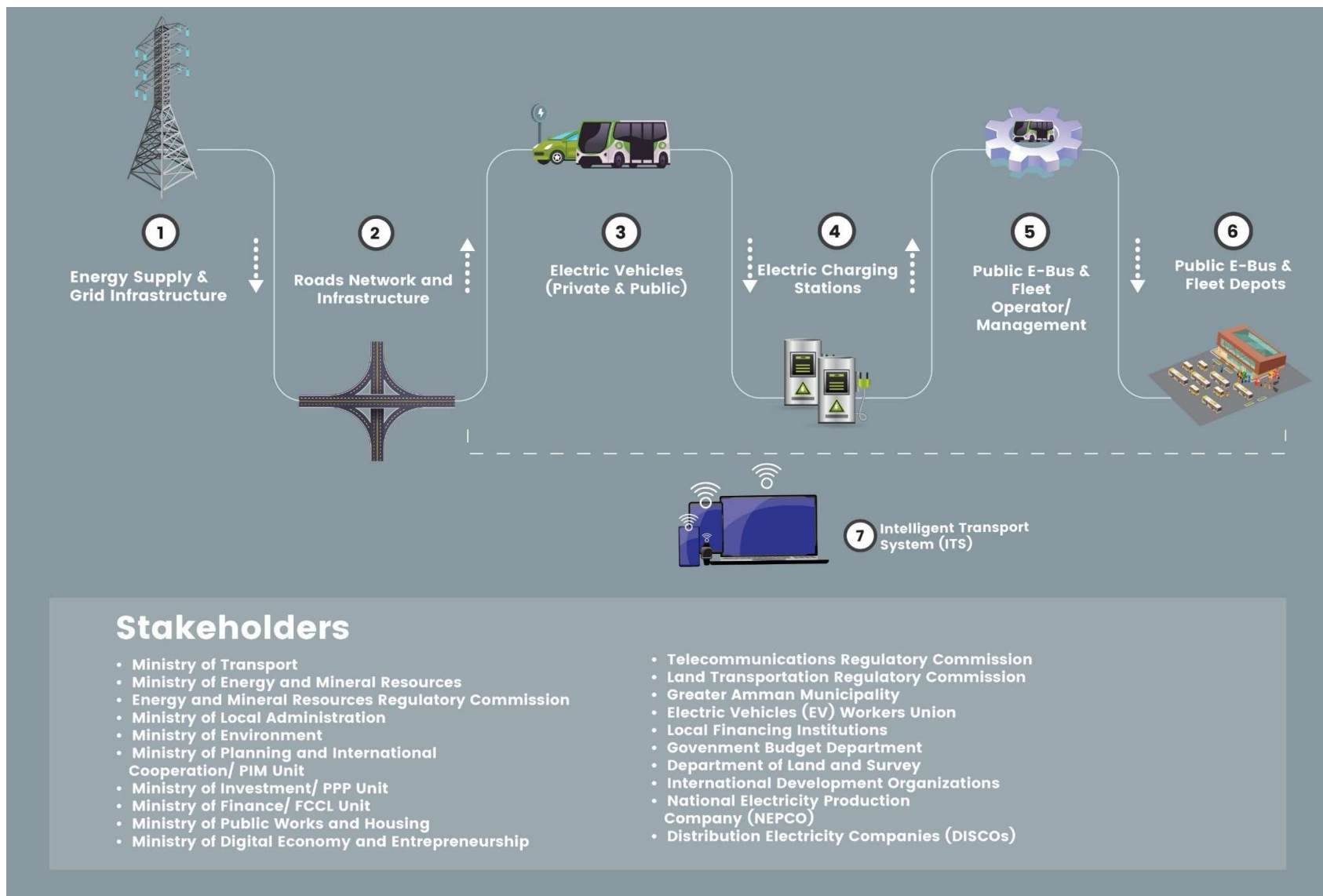
- Energy supply availability and grid assessments (transmission or distribution) need to be conducted to ensure the balancing of future needs in the energy mix from the beginning for the electric charging stations
- Country-level ITS to be managed by a single user taking into consideration the existing legal framework for Greater Amman and the whole Kingdom

**Table 10: Projects 8, 9 and 10 Value Chain**

No.	Investment subprojects	Description	Implementation Model	Funding Source	Stakeholders
1.	<b>Energy Supply and Grid Infrastructure (Transmission and Distribution) – Electric Grid Limitations and Upgrades</b>	<ul style="list-style-type: none"> <li>▪ Technical assessment of the electric grid to cope with the E-mobility future expansion and market delivery options</li> <li>▪ Design and expansion of the electrical grid which is an interconnected network for electricity delivery from producers to consumers. Electrical grids vary in size and can cover whole countries or continents. It consists of power stations: often located near the energy and away from heavily populated areas, electrical substations to step voltage up or down, electric power transmission to carry power long distances, and electric power distribution to individual customers, where voltage is stepped down again to the required service voltage</li> </ul>	<ul style="list-style-type: none"> <li>▪ Power Purchase Agreements (PPA)</li> <li>▪ Public Investment Project (PIP)</li> <li>▪ Private Investment</li> </ul>	<ul style="list-style-type: none"> <li>▪ Technical assistance grants</li> <li>▪ Equity</li> <li>▪ Commercial Lending</li> <li>▪ Insurances and guarantees</li> <li>▪ Concessional Lending</li> <li>▪ Green Credit Line Facility SMEs</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Transport</li> <li>▪ Ministry of Energy and Mineral Resources</li> <li>▪ Energy and Mineral Resources Regulatory Commission</li> <li>▪ National Electricity Production Company</li> <li>▪ Distribution Electricity Companies (DISCOs)</li> <li>▪ Ministry of Environment</li> <li>▪ Ministry of Planning and International Cooperation</li> <li>▪ Ministry of Finance</li> <li>▪ Government Budget Department</li> <li>▪ Department of Land and Survey</li> </ul>
2.	<b>Roads Networks and Infrastructure</b>	<ul style="list-style-type: none"> <li>▪ A road is a linear way for the conveyance of traffic that mostly has an improved surface for use by vehicles (motorized and non-motorized) and pedestrians. Unlike streets, the main function of roads is transportation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public Investment Project (PIP)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Technical assistance grants</li> <li>▪ Concessional Lending</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Public Works and Housing</li> <li>▪ Ministry of Transport</li> <li>▪ Land Transportation Regulatory Commission</li> <li>▪ Greater Amman Municipality</li> <li>▪ Ministry of Local Administration</li> <li>▪ Ministry of Environment</li> <li>▪ Ministry of Planning and International Cooperation</li> <li>▪ Government Budget Department</li> <li>▪ Department of Land and Survey</li> </ul>
3.	<b>Electric Vehicles-EVs (Private and Public)</b>	<ul style="list-style-type: none"> <li>▪ Government fleet means a fleet of vehicles owned by a department, agency, municipality, or the central government of Jordan and its departments, divisions, public corporations, or public agencies</li> <li>▪ Public transportation buses are generally based on the regular operation of transit buses along a route calling at agreed bus stops according to a published public transport timetable and 85 percent are individually owned and operated</li> <li>▪ Private vehicles are any vehicle that is used primarily for the private purposes of the person who owns it or of a person otherwise having the right to use it</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public Investment Project (PIP)</li> <li>▪ Private Investment</li> </ul>	<ul style="list-style-type: none"> <li>▪ Concessional Lending</li> <li>▪ Equity</li> <li>▪ Commercial Lending</li> <li>▪ Green Credit Line Facility SMEs</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Transport</li> <li>▪ Ministry of Energy and Mineral Resources</li> <li>▪ Energy and Mineral Resources Regulatory Commission</li> <li>▪ National Electricity Production Company</li> <li>▪ Distribution Electricity Companies (DISCOs)</li> <li>▪ Ministry of Environment</li> <li>▪ Ministry of Planning and International Cooperation</li> <li>▪ Ministry of Finance</li> <li>▪ Government Budget Department</li> <li>▪ Department of Land and Survey</li> <li>▪ Electric Vehicles (EV) Workers Union</li> <li>▪ Local Financing Institutions</li> </ul>
4.	<b>Electric Charging Stations</b>	<ul style="list-style-type: none"> <li>▪ An electric vehicle charging station is equipment that connects an electric vehicle (EV) to a source of electricity to recharge electric cars, neighborhood electric vehicles, and plug-in hybrids. Some charging stations have advanced features such as Smart metering, cellular capability, and network connectivity, while others are more basic. Charging stations are also called electric vehicle supply equipment (EVSE) and are provided in municipal parking locations by electric utility companies or at retail shopping centers by private companies. These</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public-Private Partnership (PPP)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Equity</li> <li>▪ Commercial Lending</li> <li>▪ Insurances and guarantees</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Transport</li> <li>▪ Ministry of Energy and Mineral Resources</li> <li>▪ Energy and Mineral Resources Regulatory Commission</li> <li>▪ National Electricity Production Company</li> <li>▪ Distribution Electricity Companies (DISCOs)</li> <li>▪ Ministry of Environment</li> <li>▪ Ministry of Planning and International Cooperation / PIM Unit</li> <li>▪ Ministry of Finance / FCCL Unit</li> <li>▪ Government Budget Department</li> </ul>

No.	Investment subprojects	Description	Implementation Model	Funding Source	Stakeholders
		stations provide special connectors that conform to a variety of electric charging connector standards. Fees for using EVSE vary from monthly or yearly flat rates to per-kWh to hourly rates. In some cases, charging stations can be free and subsidized by the local government			<ul style="list-style-type: none"> <li>Department of Land and Survey</li> <li>Electric Vehicles (EV) Workers Union</li> <li>Local Financing Institutions</li> <li>Ministry of Investment / PPP Unit</li> </ul>
5.	<b>Public Electric Bus and Government Fleet Operator / Fleet Management</b>	<ul style="list-style-type: none"> <li>Bus Operating Company means a business that provides, for a third party, transportation, including the bus and driver, for a group of people from one location to another</li> <li>Responsibility of the operator could include buying and leasing back buses to the government entity (refer to point 3 above)</li> </ul>	<ul style="list-style-type: none"> <li>Public Investment Project (PIP)</li> <li>Performance-based Operation and Maintenance including Operational Investments</li> </ul>	<ul style="list-style-type: none"> <li>Technical assistance grants</li> <li>Concessional Lending</li> <li>Equity</li> <li>Commercial Lending</li> <li>Viability Funding (VGF)</li> <li>Insurances and guarantees</li> </ul> <p>Gap and</p>	<ul style="list-style-type: none"> <li>Ministry of Transport</li> <li>Ministry of Energy and Mineral Resources</li> <li>Energy and Mineral Resources Regulatory Commission</li> <li>National Electricity Production Company</li> <li>Distribution Electricity Companies (DISCOs)</li> <li>Ministry of Environment</li> <li>Ministry of Planning and International Cooperation / PIM Unit</li> <li>Ministry of Finance / FCCL Unit</li> <li>Government Budget Department</li> <li>Department of Land and Survey</li> <li>Electric Vehicles (EV) Workers Union</li> <li>Local Financing Institutions</li> <li>Ministry of Investment / PPP Unit</li> </ul>
6.	<b>Public Electric Bus and Government Fleet Depots including charging stations</b>	<ul style="list-style-type: none"> <li>A depot is a transport system's operating base. It provides parking accommodation, servicing and maintenance facilities for vehicles, an administrative function, and facilities for staff. A fully enclosed depot is sometimes referred to as a garage. An operator may have one depot or several, depending on its fleet size or geographic coverage. The larger the operator, the greater the scope for carrying out maintenance work in-house at the depot. The principal operational tasks to be carried out at a bus depot are: <ul style="list-style-type: none"> <li>Allocating buses and crews to each duty</li> <li>Dispatching buses according to the schedule</li> <li>Processing cash paid in by conductors or drivers</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Public Investment Project (PIP)</li> <li>Public-Private Partnership (PPP)</li> </ul>	<ul style="list-style-type: none"> <li>Concessional Lending</li> <li>Equity</li> <li>Commercial Lending</li> <li>Viability Funding (VGF)</li> <li>Insurances and guarantees</li> </ul> <p>Gap and</p>	<ul style="list-style-type: none"> <li>Ministry of Transport</li> <li>Ministry of Energy and Mineral Resources</li> <li>Energy and Mineral Resources Regulatory Commission</li> <li>Greater Amman Municipality</li> <li>National Electricity Production Company</li> <li>Distribution Electricity Companies (DISCOs)</li> <li>Ministry of Environment</li> <li>Ministry of Planning and International Cooperation / PIM Unit</li> <li>Ministry of Finance / FCCL Unit</li> <li>Government Budget Department</li> <li>Department of Land and Survey</li> <li>Electric Vehicles (EV) Workers Union</li> <li>Local Financing Institutions</li> <li>Ministry of Investment / PPP Unit</li> </ul>
7.	<b>Intelligent Transport System (ITS)</b>	<ul style="list-style-type: none"> <li>Intelligent Transport System (ITS) aims to achieve traffic efficiency by minimizing traffic problems. It enriches users with prior information about traffic, local convenience real-time running information, seat availability, etc. which reduces the travel time of commuters as well as enhance their safety and comfort. The principal operational tasks to be carried out at a bus depot are: <ul style="list-style-type: none"> <li>Fare collection system application</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Public Investment Project (PIP)</li> <li>Public-Private Partnership (PPP)</li> </ul>	<ul style="list-style-type: none"> <li>Concessional Lending</li> <li>Equity</li> <li>Commercial Lending</li> <li>Viability Funding (VGF)</li> <li>Insurances and guarantees</li> </ul> <p>Gap and</p>	<ul style="list-style-type: none"> <li>Ministry of Transport</li> <li>Ministry of Energy and Mineral Resources</li> <li>Ministry of Digital Economy and Entrepreneurship</li> <li>Telecommunications Regulatory Commission</li> <li>Land Transportation Regulatory Commission</li> <li>Energy and Mineral Resources Regulatory Commission</li> <li>Greater Amman Municipality</li> <li>National Electricity Production Company</li> <li>Distribution Electricity Companies (DISCOs)</li> </ul>

No.	Investment subprojects	Description	Implementation Model	Funding Source	Stakeholders
		<ul style="list-style-type: none"> <li>- Real-time tracking and traffic management</li> <li>- Camera Control and TV monitoring</li> <li>- Personal travel planning</li> <li>- Passenger Information System</li> </ul>			<ul style="list-style-type: none"> <li>▪ Ministry of Local Administration</li> <li>▪ Ministry of Environment</li> <li>▪ Ministry of Planning and International Cooperation</li> <li>▪ Government Budget Department</li> <li>▪ Department of Land and Survey</li> </ul>



**Figure 6: Projects 8, 9, 10 Value Chain**

## SECTION 3: ACTION PLAN

The following table proposes the list of activities needed to mobilize financing for each of the climate projects under each theme and authorizes the Ministry of Environment, Ministry of Finance and Ministry of Planning and International Cooperation to jointly lead the development of the financing packages in coordination with relevant line ministries and agencies towards fundraising for each theme during COP28.

**Table 11: Sample Action Plan to be followed for each theme/project:**

Milestone	Process for Mobilization of Financing for Climate Projects	Stakeholders	Lead Agency	Date
T1	<b>Project 1:</b> Replacing freshwater use with treated wastewater in non-domestic sector  <i>Define Target: XX MCM of freshwater use replaced with TWW by YEAR</i>			
T1.A	First Donor Consultation on the proposed financing packages – identify ongoing/upcoming activities that could support this. Agreement on ways to coordinate across components to ensure implementation timelines are aligned	Donor partners interested in water and agriculture sectors, relevant municipal entity and other govt. bodies	MoEnv/ MOPIC	Mid-Jan 2023
T1.B	Establish thematic task force/working group for preparation of the pre-feasibility study	List GOJ entities	MoEnv/ MOPIC	Mid_Jan 2023
T1.C	Preparation of comprehensive pre-feasibility study covering all components	MoEnv with all relevant line agencies	MoEnv, other relevant agencies with consultant team	Feb 2023
T1.D	Consultation with other relevant stakeholders, including private		MoEnv/	

Milestone	Process for Mobilization of Financing for Climate Projects	Stakeholders	Lead Agency	Date
	sector, commercial banks, climate finance support facilities etc, as needed		MOPIC	
T1.E	Second donor/other stakeholder consultation on the proposed financing packages	Donor partners (as above)		March 2023
T1.F	Action plan for next steps based on consultations with a goal (date) to launch this 'FW-TWW replacement program' at COP28			

## ANNEXES

## ANNEX 1. HIGH-LEVEL SUMMARY OF THE MULTIPLE SOURCES OF CLIMATE AND GREEN FINANCING NEEDS

This section narrows down the list of potential financing sources for climate investment projects, which will aid the development of a financing framework to analyze each project based on its merits and determine the optimal financing modality and structure. In addition, this section will touch on project implementation models that would be applied to these projects. Annex (4) illustrates the template that will be used to prepare the feasibility studies for the priority projects and themes. The landscape of climate funding in Jordan could cover one of the sources as described in table (13).

**Table 12: Landscape of climate funding sources**

No.	Funding Source	Description
1.	<b>Concessional Loan (Sovereign Debt)</b>	This is a financing instrument with no or lower interest rates and a more extended repayment schedule than those of the standard market. The Government would usually apply for this financing. The project would have to show proper alignment with public project priorities and has also to align with many International Development Organizations' criteria such as IRR analysis and environmental and social appraisals. The project would also need to have a direct and measurable climate impact, and/or strengthening of enabling conditions related to climate
2.	<b>Grant</b>	A grant is a sum of money that is paid to the beneficiary without the expectation of the money being returned. They are most commonly used to fund specific activities, especially at early stages, and may include 1) technical and financial feasibility studies 2) risk and vulnerability assessments, and 3) project design and management systems
3.	<b>Equity</b>	Equity refers to a share of ownership, where a portion of the proceeds from a project or endeavor is allocated to the owner, according to their share. It is often referred to as risk capital and is most commonly used to finance any shortfall not covered by a grant, concessional loan, or commercial debt. Equity is most commonly provided by project owners, which helps incentivize project success, as equity investment becomes worthless if a project fails. Some climate financiers provide a portion of equity towards funding gaps. Equity makes up approximately 20 to 25 percent of any project ownership
4.	<b>Climate Financing (Green Climate Fund)</b>	This is the world's largest dedicated fund helping developing countries reduce their GHG emissions and enhance their ability to respond to climate change. GCF aims to leverage its financing to crowd in additional financing, from both public

No.	Funding Source	Description
		and private sector sources. The GF can either provide grant financing to the public sector or the private sector, however, all projects need to have a strong climate rationale and contribute to transformational change/paradigm shift compared to a BAU case
5.	<b>Debt Swaps</b>	Debt swaps provide opportunities for raising capital in low-income countries to address environmental and other policy challenges and support green growth. There are also a range of risks and management issues that need to be addressed if debt swaps are to achieve their objectives. The rationale of debt swaps is that debt can be acquired at a discount. When creditors do not expect to recover the full nominal value of debts, they may be willing to accept less. In exchange for (partial) cancellation of the debt, the debtor government is prepared to mobilize the equivalent of the reduced amount in local currency for agreed purposes on agreed terms
6.	<b>Green Bonds</b>	A debt instrument that can mobilize financial resources from the domestic or international capital markets for climate change adaptation, mitigation, and other environmentally-friendly projects. Their unique characteristics are the specification that the proceeds are to be invested in projects that generate environmental benefits
7.	<b>Government revenue</b>	This includes government tax, non-tax revenue (property income, administration fees, fines), and capital revenue (sales of assets or stocks). Currently, the General Budget Department (GBD) does not apply a "Climate Change Budget Code" to tag national budget heads about climate change
8.	<b>Green Credit Line Facility SMEs</b>	This facility structures and sets up a guarantee facility to secure loans granted by local financial institutions for green investments into low-carbon technology throughout the country. The facility is in turn secured for the long term through the financial compensation of emission reductions. The compensation mechanism is results-based, thus rewarding SMEs for over-fulfilling expected emission reductions; the company benefits from improved cash flow and consequently reduced default rates.
9.	<b>Insurance and guarantees</b>	Insurance and guarantees are mechanisms that insure some of all investments in a project against potential loss. Insurance-type mechanisms are useful means to de-risk projects when they are deemed too risky by investors. This way, a small amount of financing (used to pay for insurance) can help leverage substantially larger amounts of financing from other (often private or commercial) investors

The implementation models for the investment projects are identified and described in table (14).

**Table 13: Potential implementation models of the priority projects**

No.	Implementation Model	Description
1.	<b>Public Private Partnership (PPP)</b>	A long-term contract between the public and private party in which the private sector finances, delivers, maintains, and operates the public infrastructure (through debt and equity financing). PPP types include 1) Availability based and 2) User pay/demand. In some projects, Viability Gap Financing (VGF) might be perused if the project is not financially viable but economically justified. In most PPPs, the Government would assume some contingent liabilities including issuing a sovereign guarantee to risks associated with payment to the private party in cases of default. In the case of climate projects, mitigation projects that generate revenue and lead to a return on investment would be suitable for this type of financing. Jordan has approved a new PIM/PPP policy framework under which a new PPP law was enacted in the year 2020, with rules and procedures for PPP development and implementation
2.	<b>Performance-based Contracting</b>	This is a form of 'creative financing' for capital improvement which allows funding energy upgrades from cost reductions. Under this arrangement, an entity implements a project to deliver efficiency improvement and uses the stream of income from the cost savings, or output produced, to repay the costs of the project, including the costs of the investment. Essentially the entity will not receive its payment unless the project delivers energy savings as expected. The approach is based on the transfer of technical risks from the client to the entity based on performance guarantees given by the entity. Remuneration is based on demonstrated performance; a measure of performance is the level of savings or service. This model is a means to deliver infrastructure improvements to facilities that lack energy engineering skills, manpower or management time, capital funding, understanding of risk, or technology information
3.	<b>Public Investment Project (PIP)</b>	This is the traditional method of financing, delivering, maintaining, and operating the public infrastructure through government financing from all available capital sources such as revenues, taxes, and international aid.
4.	<b>Private Investment</b>	Direct finance by the private sector (through debt and equity financing) with no risk or guarantee taken by the public sector or government

## ANNEX 2: LIST OF PROJECTS FROM CC POLICY DOCUMENT

This section represents list of projects from CC Policy document as per the below table (15).

**Table 14: List of projects from CC Policy document**

Measures	Sector	Expected Implementation Cost (USD)	Cumulative 2 Emission Reduction (Gt CO <sub>2</sub> e)
Increased Percentage of Electricity Generated from Renewables (2020, 20% to 2030, 35%) and 9 % Energy efficiency distributed among (residential, services and industry). Implementation through measures listed in the national strategy action plan	Energy	2,406,800,000	4528
Introduction of concentrated solar power (CSP) of 100 MW and CSP 300 MW	Energy/ Renewable Energy	1,764,000,000	2,921
Measures in Residential sector: - Natural gas distribution in the main cities (Amman , Zarqa , Aqaba ) - Solar water Heaters (SWH) Project FOR 90,000 Houses	Energy	13, 000,000 65,000,000	988 500
Energy Efficiency Projects in industry: - Returning Un-Returned Condensate to the Feed Water Tanks in Food Industry - Insulating the un-insulated pipes, fittings and tanks in food industries - Using Regenerative burners instead of conventional burners in Steel Reheating Industry	Energy	300,000	250

Measures	Sector	Expected Implementation Cost (USD)	Cumulative <sup>2</sup> Emission Reduction (Gt CO <sub>2</sub> eq)
185 MW PV for the Aqaba Amman Water Desalination and Conveyance Project (AAWDCP) (50% of the overall needed power demand covered by Wheeling and Net Metering)	Water/Renewable Energy	2,820,910,000	799.1
Bus Rapid Transit Project (BRT) as described in Amman GCAP - (2 <sup>nd</sup> phase)	Energy / Transport	282,309,071	3358.38
Electric bus fleet in Amman, Karak, Ma'an and Tafielah	Energy / Transport	45,00,000	351.75
Intelligent transport systems (ITS)	Energy / Transport	78,556,700	2759.21
Promoting Car-hybrid and electric at national level - including 50% of the Public fleet will be EVs- and assuming annual increase in private cars adoption by 2%)	Energy / Transport	56,500,000	2503
Biogas collection and utilization from three domestic solid waste landfills: in Al-Dulail, Al-Salt and Maddaba	Solid waste	7,500,000	1643
Implementing composting units for pre-segregated bio-waste in 4 Areas with a total capacity of 200 tonnes/day	Solid waste	5,118,226	73.8
Biogas generation by utilizing the sludge generated from domestic wastewater treatment plants: in five areas (Ramtha, Madaba, AlSalt, Wadi Arab and Baqa'a)	Wastewater	20,000,000	557
Use of steel slag and/or fly ash to substitute the raw materials needed to produce clinker	Industry	3,445,000	132.65
Increase the percentage of Pozzolana in CEM II	Industry	2,330,000	194.82
Produce new cement product CEM IV with 45% of Pozzolana	Industry	1,635,000	111.92

Measures	Sector	Expected Implementation Cost (USD)	Cumulative <sup>2</sup> Emission Reduction (Gt CO <sub>2</sub> e)
Use of biomass (MSW or/and Sewage Sludge) as alternative fuels	Industry	3,000,000	409.23
KEMAPCO Project- Reduction of N <sub>2</sub> O in Ammonia Production	Industry	6,000,000	1508
Implementing pilot interventions to scale-up the sustainable use of cooling technologies with climate-	Industry	2,400,000	7.23
Climate smart agriculture	Agriculture and Forestry	500,000	40.85
Urban tree Plantations (32500 trees)	Agriculture and Forestry	250,000	9.0
Rangeland restoration (200,000 dunums)	Agriculture and Forestry	10,000,000	5821
Forest tree Plantations (2,000,000 trees)	Agriculture and Forestry	3,000,000	247.36
<b>Total estimated cost of the mitigation actions is 7.54 billion USD (7,539,553,997 USD)</b>			

### ANNEX 3: LIST OF PROJECTS FROM NDC AND NAP

This section represents list of projects from NDC and NAP as per the below table (16).

**Table 15: List of projects from NDC and NAP**

Project	Reference	Sector	Cost (USD)
Wastewater networking (al-Koura district), in addition to lifting stations implementation & wastewater treatment plant for different villages	NDCP Action Plan	Water	52,380,000
Preparation of detailed designs and rehabilitation of water network in Ardah district/ Balqa Governorate	NDCP Action Plan	Water	21,216,548
Establish a financing facility for rainwater harvesting from household roofs to support projects that augment rural and urban water supply	NDCP Action Plan	Water	4,057,000
Blue Economy Principles for Improved Touristic Competitiveness, Livelihoods of the Fisherman Community, Industrial Development and Monitoring Indicators of Pollution Control and Climate Change in the Jordanian Sector of the Gulf of Aqaba,	NDCP Action Plan	Water	14,472,780
Green Actions in Agriculture and Forestry - the protection and sustainability of forest wealth	NDCP Action Plan	Agriculture	5,987,500
Reduce soil erosion through the management and harvesting of rainwater by small farmers in rural areas of Jordan	NDCP Action Plan	Agriculture	28,318,421
Supporting poor families in Ma'an Governorate, improving the income of poor families in the northern Jordan Valley, Irbid Governorate - investment in small ruminants to support poor rural families	NDCP Action Plan	Agriculture	8,880,000

Project	Reference	Sector	Cost (USD)
Disseminate climate change adaptation techniques through smart agriculture production	NDCP Action Plan	Agriculture	2,098,440
Develop rangelands for climate change mitigation through social cooperation and water harvesting techniques water harvesting and improving the income of poor families in	NDCP Action Plan	Agriculture	32,739,219
Implement climate change proofing for agricultural crops including setting up an integrated Pest management (IPM)	NDCP Action Plan	Agriculture	254,250
Strengthening surveillance and establishment of highly sensitive alert system by developing health forecast system for any climate sensitive disease through 15 hospitals and 20	NDCP Action Plan	Health	1,801,672
Improve irrigation efficiency in the Jordan valley	National Green Growth Plan	Water	27,700,000
Increase the resilience of displaced persons and host communities to climate change related water challenges	National Green Growth Plan	Water	7,000,000
Increase the availability of WASH in schools and strengthening standards for climate change impacts	National Green Growth Plan	Water	1,500,000
Reduce water losses and increase water savings in Kind Abdullah Canal	National Green Growth Plan	Water	500,000
Undertake feasibility studies to explore storm water systems and groundwater filtration	National Green Growth Plan	Water	15,000,000

Project	Reference	Sector	Cost (USD)
Construct reservoirs and implement a parallel community water resource stewardship program for several communities in the Jordan Valley	National Green Growth Plan	Water	66,900,000
Technical assistance to support water efficiency in businesses, industries and commercial activities	National Green Growth Plan	Water	4,140,000
Develop a flexible crop planning and variety selection methodology and decision-making process based on crop per drop and economic competitiveness	National Green Growth Plan	Agriculture	7,500,000
Develop and implement pipeline of projects and policy recommendations to increase the use of aquaponics and hydroponics in urban and rural areas	National Green Growth Plan	Agriculture	21,000,000
Support rural green growth and employment through ecosystem restoration	National Green Growth Plan	Agriculture	6,000,000

## ANNEX 4: TEMPLATE FOR THE PRE-FEASIBILITY STUDY

This section represents the Project Concept Note Template for Public Investment Projects in the Infrastructure and Social Sectors as per the below table (17).

**Table 16: Project Concept Note Template**

<b>Project Concept Note Template for Public Investment Projects in the Infrastructure and Social Sectors</b>	
<b>Section 1: Executive Information and Project Profile</b> <i>Executive Information is provided to allow decision makers easy access to relevant data. It may be preferable or even easier to complete this section after the other detailed sections have been completed.</i>	
<b>Name of Sponsoring Public Agency/entity:</b>	<i>Clearly identify the public agency responsible to submit/in charge of the project</i>
<b>Responsible Line Ministry:</b>	<i>Clearly identify the line ministry responsible for the public agency</i>
<b>Submission Date:</b>	<i>The date is automatically created once the project is submitted/registered at the NRIP</i>
<b>Name of Project:</b>	<i>Be sure to use the correct title of the project in full. Avoid any abbreviated names or 'working titles'. Once a project has been accepted and issued with a reference number in the NRIP, the title shown in this box will become its official name</i>
<b>Project ID Number (according to NRIP)</b>	<i>The project ID Number is automatically created once the project is submitted/registered at the NRIP</i>
<b>Sector:</b>	<i>Clearly identify the sector and corresponding sub-sector, according to the sector policies</i>
<b>Physical Description of the Project / Type:</b>	<i>Provide only enough information to illustrate the physical nature of the project. For example: Construction of 235km of paved road between [town] and [town], Expansion of 30 bed hospital, Rehabilitation of a 10 km 1200mm water pipeline, etc.</i> <i>Type of project: construction, expansion, rehabilitation, replacement, improvement, etc.</i>
<b>Location (Governorate/Sub-Governorate/City/Municipality):</b>	<i>Name the location of the project or locations if the project includes more than one site. If possible please use map reference or GPS co-ordinates</i>
<b>Name of partners – if applicable:</b>	<i>Related to project coordination and permit issuance i.e. environmental permits, road excavation permits, etc.</i> <i>If more than one organization are requesting this project and will collaborate in its implementation, please list the name(s) of the other co-requesting organization(s)</i>
<b>Estimated start date of the project (month / year):</b>	<i>The start date would be:</i> <ul style="list-style-type: none"> <li><i>In the case of a small project not requiring a Feasibility Study: the point at which the Procurement Notice is published</i></li> </ul>

	<ul style="list-style-type: none"> <li>In the case of medium and large projects where a Feasibility Study is required: the point at which the Feasibility Study begins. This is the point at which expenditure starts to be committed (for the FS).</li> </ul>																				
<b>Estimated date of operation of the completed project (month / year):</b>	In all cases, this would be the date at which the project is expected to enter operational service and start delivering, partially or totally, the expected benefits																				
<b>Project Readiness:</b>	<p>Describe any relevant information regarding the readiness of the project. For example, if land expropriation is required or not.</p> <p>Add information regarding the status of pre-investment analysis (studies, surveys, etc.) and any permits to implement and operate the project.</p> <p>Provide any information regarding the status of appraisal studies (technical, financial, economic, environmental, social and stakeholders)</p>																				
<b>Estimated Capital Cost of the Project (CAPEX):</b> <p>This is the total capital cost required to complete the proposed project which must include all items necessary to allow the project to achieve its designed functions and objectives. Provide an estimate of the cost of further preparatory studies required for project appraisal. As an example, in a health clinic, in addition to building and construction costs, all the medical equipment, fixtures, fitments and furniture should be included. The costs of acquiring land (including compensation and settlement costs) as well as all technical consultancy fees (feasibility, design and supervision) and costs should also be included. Please also include the add-on costs of bringing necessary utility service to the site eg water pipe, electricity cable or even a service road to create access in the construction costs.</p> <table border="1"> <thead> <tr> <th>Component</th><th>Cost (JOD)</th><th>Estimated duration (months)</th><th>Sources used for costing</th></tr> </thead> <tbody> <tr> <td>Land acquisition</td><td></td><td></td><td></td></tr> <tr> <td>Feasibility</td><td></td><td></td><td></td></tr> <tr> <td>Design and Supervision</td><td></td><td></td><td></td></tr> <tr> <td>Construction</td><td></td><td></td><td></td></tr> </tbody> </table> <p>It is also necessary to specify the total amount of the capital requirement in terms of</p> <p>a) National Budget funds required (state the actual amount required) and the amount which could be provided through foreign sources</p> <p>b) Estimated capital costs should be presented in real costs</p> <p>c) The sources for costing include: none; secondary sources (conceptual design: averages, website, expert opinion); primary sources (detailed data: detailed design, well-defined specifications, final data, plans, actual quotes, final prices in contracts)</p>		Component	Cost (JOD)	Estimated duration (months)	Sources used for costing	Land acquisition				Feasibility				Design and Supervision				Construction			
Component	Cost (JOD)	Estimated duration (months)	Sources used for costing																		
Land acquisition																					
Feasibility																					
Design and Supervision																					
Construction																					
<b>Estimated project duration (years):</b>	Refer to above schedule. Time needed for the planning and execution of the project																				
<b>Estimated operation and maintenance costs (first full fiscal year of operation):</b> <p>This is the total cost of operating, supplying and maintaining the project in the first full budget year after the time of entry of the project in to its operational phase. The purpose of this information is to inform the budgeting process of future additional annual costs that would be incurred through</p>																					

*implementing the project. It should include an estimate of all salaries, utility costs as well as the cost of supplies, and services. Some operational costs may already be taken into account in the budget planning. For example, in the case of replacing an old school with a new one, some - or maybe all - teachers' salaries are covered by the existing budget. It is important to identify separately those operational costs that will be new calls on the budget. In the case of completely new projects, all operational costs are usually new calls on the budget. The requirement to complete this section applies equally to externally funded projects.*

**Note:** *If the project is due to enter service part way through a budget year a separate note must be made of the costs of operation in the months immediately following the date of the project's entry in to operation to the end of the fiscal year.*

Section 2: Justification, Objective and Relevance	
<p><b>2.1 Why does this project need to be implemented (In terms of problem to be resolved or opportunity to be exploited)? Include basic information about the scale of the problem or opportunity.</b></p> <p><i>a) Projects can be generated either to fix a problem that only the government can resolve or an opportunity that the private sector has been unable to address.</i></p> <p><i>b) To stand the best possible chance of justifying the commitment of government or external funding, it is essential to describe the nature and scale of the problem or opportunity that the proposed project will address.</i></p> <p><i>c) The description should explain the causes of the problem and its effect(s) or the origin of the opportunity. It should also explain why the problem/opportunity has occurred and for how long it has been a problem or opportunity.</i></p> <p><i>d) The scale of the problem / opportunity should be explained in terms of (as examples) how many people are affected by a problem or what size of market might be available in a certain market opportunity scenario. Please be clear about the numbers involved and where the evidence to support the numbers comes from.</i></p> <p><i>For example, the project is designed to solve the problem of transport trucks entering Amman city, which is causing traffic in the city. It is also expected to improve transport for trucks connecting Amman to Petra. This project is also crucial for the country's integration in terms of its connection to neighboring countries. In this regard, the project will facilitate international trade and commerce.</i></p>	<p><b>Quality Score</b></p> <p><b>Fail</b> = Fails to describe the problem or opportunity or that the problem / opportunity is described but is not considered important</p> <p><b>Not Clear</b> = There is inadequate numerical information about the scale of the problem or opportunity</p> <p><b>Pass</b> = The problem, its reasons and causes are explained fully or opportunities are explained fully with evidence of scale</p>
<p><b>2.2 What is / are the objective(s) of the proposed project?</b></p> <p><i>State the objectives that the proposing authority aims to meet with this proposal. There should be a single primary objective expressed in no more than two or three sentences.</i></p> <p><i>The objectives should be specific to dealing with the problem/opportunity described in section 2.1; they should be measurable (to achieve what by when?). They should also be realistic against previous experience of similar projects.</i></p>	<p><b>Quality score</b></p> <p><b>Fail</b> = Objectives not described</p> <p><b>Not Clear</b> = Objectives described but not clearly in accordance with Guidance</p> <p><b>Pass</b> = Objectives clearly described</p>

<p><i>An example of an objective might be 'to reduce fatal road accidents in [location] to less than [number] by [date] through [construction of...]'</i></p> <p><i>A number of secondary objectives may also be listed if appropriate.</i></p>	
<p><b>2.3 State how the project will fulfil objectives of the Vision 2025 National Development Plan, Sector Strategies and plans or other government policy.</b></p> <p><i>Project proposals need to demonstrate that they are being pursued in the interests of the economic or social development needs of the nation or a local area. The government policies or strategies that are relevant to the proposed project, must be referenced here, and it must be elaborated how the project contributes to their achievement. The project may only meet a single policy objective or it may aim to meet more than one. If this is the case, each one must be referenced.</i></p>	<p><b>Quality Score</b></p> <p><b>Fail</b> = No link was established between the project and Vision 2025, NDP or sector strategies and plans</p> <p><b>Not Clear</b> = Reference has been made to the relevant national or sector programs but their link to the proposed project is not clear</p> <p><b>Pass</b> = Reference has been made to the relevant Plan or Strategy and a clear explanation has been provided about the link to the proposed project.</p>
<p><b>2.4 Who are the intended beneficiaries of the project and how many?</b></p> <p><i>Depending on the nature of the proposed project, describe the main beneficiaries of the project. Estimate the predicted use of the project using relevant available statistics. When forecasts are being quoted, please include the source of the forecast data.</i></p> <p><i>As an example, if the project relates to a road, provide traffic statistics. If the project relates to healthcare, provide statistics on numbers and the nature of hospitalizations within the project's target area of coverage. If the project relates to a school, use population data to show how many school age children live within a realistic radius of the school.</i></p> <p><i>The source of the evidence should be provided as well as the date at which the statistics were gathered. Historic data showing trends would further strengthen the proposal, if available. Rather than just providing basic statistics, try to relate the numbers to the proposed scale of the project.</i></p>	<p><b>Quality Score</b></p> <p><b>Fail</b> = fails to describe intended beneficiaries of the project</p> <p><b>Not Clear</b> = Intended beneficiaries of the project not clearly described or quantified</p> <p><b>Pass</b> = Intended beneficiaries of the project are described clearly and quantified</p>
<p><b>2.5 What are the intended activities, outputs (deliverables) and outcomes of the proposed project?</b></p> <p><b>Activities</b></p> <p><i>List the main activities of the proposed project. Activities are the tasks or actions required to achieve the objective;</i></p>	<p><b>Quality Score</b></p> <p><b>Fail</b> = Either activities, outputs and outcomes are not described</p> <p><b>Not Clear</b> = Activities, outputs and outcomes are described but not</p>

<p><i>for example, the construction of a new clinic at [location]; fit out with equipment and supplies; ensure adequate staffing and all other staff necessary to operationalize the clinic.</i></p> <p><b><u>Outputs (deliverables)</u></b>  <i>List the main outputs and outcomes of the project. Outputs might include (as examples) number of kilometers of new road or number of school places or hospital beds added by a certain date.</i></p> <p><b><u>Outcomes</u></b>  <i>Outcomes should relate to resolving the problem described in section 2.1: What will have been gained by implementing the project and how can we measure the degree of success of the project?</i>  <i>For example, in the case of a new road, one of the outcomes might be described as a 50% reduction in accidents in the first year of the new road. In the case of new hospital beds, a successful outcome might be the reduction of waiting times in hospital admissions by 2 hours in the first 12 months.</i></p> <p><i>Outcomes are likely to be variable over the operational life of the facility created by the project – often less in the first year of operation and greater in subsequent years as operating efficiency improves. Conversely as demand grows, delivery efficiency may be compromised if a facility has to operate at over- capacity. This variability should be reflected in stating the estimated outcomes – i.e. what will be achieved by when?</i></p>	<p>clearly or appear not to be linked to the description of the project  <b>Pass</b> = Intended activities, outputs and outcomes are described clearly</p>
<p><b>2.6 Are there any precedents in the country, in the sector or the sub-sector?</b> (Either answer yes or no - if 'yes' please describe the lessons learned - if 'no' please describe the extra measures that will be taken to address this risk).</p> <p><i>Projects that have not had precedents are almost always at additional implementation risk. The purpose of this question is to ensure that:</i>  <i>If there is a precedent for the project previously in Jordan, were the outputs and outcomes satisfactory and most importantly what were the lessons learned that could benefit the present proposal?</i>  <i>If there are no precedents, what mitigation measures have been considered to manage the risks of time and budget over-runs?</i></p>	<p><b>Quality score</b></p> <p><b>Fail = Either:</b> there are no precedents for the project in the country, sector or sub-sector and no credible mitigating measures have been described <b>OR:</b> there have been precedents in the country, sector or sub- sector but the outcomes were poor with no obvious mitigating measures.</p> <p><b>Not Clear=</b> Mitigating measures are not included or described.</p> <p><b>Pass = Either:</b> There has been no precedent for the project in the country,</p>

	sector or sub-sector but credible mitigating measures have been described <b>OR:</b> There have been precedents and the outcomes were positive.
<p><b>2.7 List all the positive and negative social and environmental effects of the project. In addition, please explain if the project may negatively affect different groups (by gender, race, religion, disability etc.) and if so how these effects can be mitigated</b></p> <p><i>List the positive effects of the project. All worthwhile projects should create positive effects. Some projects can disproportionately benefit some groups more than others. Often this is intended; for example, in the case of a project to build better access to government buildings for disabled people.</i></p> <p><i>Project proposers should consider the positive effects that the project would likely have on different groups of people or communities. For example, positive or negative social impacts include job creation/destruction, increase in public health and safety in the city, reduced air and environmental pollution, increased roadside traffic within the city, poverty alleviation.</i></p> <p><i>Many projects have some form of negative impact, the most common of which are climate change, disasters and environmental, and the displacement of people in order to free up space for a project. Careful consideration should be given to all negative impacts and how they can be mitigated. They should be listed here.</i></p> <p><i>Some projects may negatively affect a minority group disproportionately for example a proposed road that crosses a site that has some religious significance for a certain religious group. Again these disproportionate negative impacts should be listed here. This should include measures on how to reduce nuisance from construction activities from the project, in the local area.</i></p>	<p><b>Quality Score</b></p> <p><b>Fail</b> = fails to list any effects of the project <b>OR</b> the negative effects are unacceptable <b>Not Clear</b> = positive and negative effects are listed but not explained clearly <b>Pass</b> = positive and negative effects are explained clearly and appear acceptable</p>
<p><b>2.8 Potential climate change impact or benefit – if applicable</b></p> <p><i>Clearly identify any positive and negative impact on climate change. For example, the project is expected to reduce carbon dioxide emissions, a leading cause of climate change. The corresponding benefit was estimated as the social cost of carbon for Jordan.</i></p>	<p><b>Quality Score</b></p> <p><b>Fail</b> = fails to list any effects of the project <b>OR</b> the negative effects are unacceptable <b>Not Clear</b> = positive and negative effects are listed but not explained clearly <b>Pass</b> = positive and negative effects are explained clearly and appear acceptable</p>

## 2.9 List the alternative implementing options that have been considered for achieving the objectives

*No government can fulfil all tasks required in an economy. It is therefore more realistic to focus only on the projects that only the government can do. Identify if the project can be implemented as a Public Private Partnership (PPP), fill in the below form under the title "Applicability of PPP"*

### APPLICABILITY OF PPP

<b>A.</b>	<b>PPP Project Rationale:</b> (Please check all that apply)																																																							
	<ul style="list-style-type: none"> <li><b>i)</b> Project is difficult to implement with financial resources or the expertise of Government alone <input type="checkbox"/></li> <li><b>ii)</b> Private investment would potentially increase quality / level of service compared to what Government could accomplish on its own <input type="checkbox"/></li> <li><b>iii)</b> There is an opportunity for competition among private investors which may reduce the cost of providing public service <input type="checkbox"/></li> <li><b>iv)</b> Private investment could allow the project to benefit from the private sector's innovation, modern technologies, knowledge and expertise in project development and management <input type="checkbox"/></li> <li><b>v)</b> Project includes the construction, rehabilitation, operation, and / or maintenance of public infrastructure <input type="checkbox"/></li> <li><b>vi)</b> Others:</li> </ul>																																																							
<b>B.</b>	Please describe the end services that a PPP operator could deliver:																																																							
<b>C.</b>	<p>Please indicate the proposed risk allocation between the private and public sector illustrated below:</p> <table border="1"> <thead> <tr> <th data-bbox="310 1213 675 1360">Risk Category</th> <th data-bbox="675 1213 760 1360">Public Sector</th> <th data-bbox="760 1213 844 1360">Shared</th> <th data-bbox="844 1213 948 1360">Private Sector</th> <th data-bbox="948 1213 1443 1360">Additional information</th> </tr> </thead> <tbody> <tr> <td>Design risk</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Land acquisition and resettlement</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Financing risk/Financial Commitments</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Construction risk</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Operation and maintenance risk</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Environmental/social risk (operation)</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Ownership transfer risk</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Ability to pay risk</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Interest rate risk</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Demand risk</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Risk Category	Public Sector	Shared	Private Sector	Additional information	Design risk					Land acquisition and resettlement					Financing risk/Financial Commitments					Construction risk					Operation and maintenance risk					Environmental/social risk (operation)					Ownership transfer risk					Ability to pay risk					Interest rate risk					Demand risk				
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Demand risk																																																								

	Other				
<b>D.</b>	Would any legislation/regulation need to be enacted to allow private sector to deliver and charge for services? Yes <input type="checkbox"/> No <input type="checkbox"/> Not Known <input type="checkbox"/>				
<b>E.</b>	<b>i)</b> Estimated period of contract: ____ years If uncertain, please specify a range - Less than 10 <input type="checkbox"/> 10-15 <input type="checkbox"/> 15-20 <input type="checkbox"/> 20-35 <input type="checkbox"/>		<b>ii)</b> Estimated economic life of project: ____ years If uncertain, please specify a range - <10 <input type="checkbox"/> 10-30 <input type="checkbox"/> >30 <input type="checkbox"/>		
<b>F.</b>	Please specify the preferred mode of project procurement: Solicited <input type="checkbox"/> Unsolicited <input type="checkbox"/>  If "Unsolicited", please indicate if the project complies with the conditions for direct / unsolicited proposals laid out in Article 22 of the PPP Law: Yes <input type="checkbox"/> No <input type="checkbox"/>  If yes, provide detail on how the project complies with the PPP Law and detail on the unsolicited proposer?				
<b>FINANCIAL ANALYSIS AND BANKABILITY</b>					
<b>A.</b>	<b>i) Please indicate the source of project revenue (Please tick as applicable):</b> User Charges <input type="checkbox"/> Line Ministry / Agency <input type="checkbox"/> Both <input type="checkbox"/>				
	<b>ii) Please complete the following if you have ticked "User Charges" or "Both":</b> Estimated average benchmark charges payable by User: JOD _____ Estimated number of Users (per day): _____				
	<b>iii) Please complete the following if you ticked "Line Ministry / Agency" or "Both":</b> <b>a)</b> Does the Line Ministry / Agency have separate revenue raising power? Yes <input type="checkbox"/> No <input type="checkbox"/> <b>b)</b> Does the Line Ministry / Agency have a budget for delivering these services? Yes <input type="checkbox"/> No <input type="checkbox"/> If "Yes", please indicate how much: <b>c)</b> Please provide an estimate of the number of Users (per day): _____ <b>d)</b> Please provide an estimate of the fiscal commitments and contingent liabilities (FCCL) arising from the project: Are the estimated FCCL arising from the project affordable to the Government?: <b>e)</b> Yes <input type="checkbox"/> No <input type="checkbox"/> <b>f)</b> Viability Gap Funding needed?: Yes <input type="checkbox"/> No <input type="checkbox"/>				
<b>B.</b>	Do the estimated user charges, line ministry/agency payments, or combination of both, provide sufficient revenue to cover project costs? Yes <input type="checkbox"/> No <input type="checkbox"/>  Please add detail on assumptions/calculations as necessary:				
<b>C.</b>	Are you aware of a similar project being delivered through a PPP Model elsewhere? Yes <input type="checkbox"/> No <input type="checkbox"/>				

	If "Yes", please indicate where: Jordan <input type="checkbox"/> Arab states <input type="checkbox"/> Rest of the world <input type="checkbox"/> (Please attach any reference material i.e. project reports, website link etc.)			
<b>D.</b>	Has the project received any feedback from lenders, equity providers, MDBs/DFIs, operators, etc.? Yes <input type="checkbox"/> No <input type="checkbox"/>  If "Yes", please provide summary of feedback:			
<b>SECTION FOUR (REQUIRED)</b>				
<b>IMPLEMENTATION</b>				
<b>A.</b>	Based on project information, we determine that this project should be procured as a PPP? Yes <input type="checkbox"/> No <input type="checkbox"/>  Please explain why:			
<b>B.</b>	Please indicate if there are Financial Resources available for project development (e.g. feasibility study): Yes <input type="checkbox"/> No <input type="checkbox"/> (If "Yes", indicate how much):			
<b>SECTION FIVE (REQUIRED)</b>				
<b>TIMELINE</b>				
<b>A.</b>	Please provide an indicative time line:			
	<b>PPP Project</b>	Date	<b>Public Project</b>	Date
	<b>i)</b> Submission of Project Concept Note		<b>i)</b> Submission of Project Concept Note	
	<b>ii)</b> NRIP Registration		<b>ii)</b> NRIP Registration	
	<b>iii)</b> Pre-feasibility study		<b>iii)</b> Pre-feasibility study	
	<b>iv)</b> Feasibility study and FCCL report		<b>iv)</b> Feasibility study	
	<b>v)</b> Development of tender documents		<b>v)</b> RFQ	
	<b>vi)</b> RFQ		<b>vi)</b> RFP	
	<b>vii)</b> RFP )		<b>vii)</b> Contract negotiation )	
	<b>vii)</b> Contract negotiation )		<b>viii)</b> Signing the contract )	
	<b>ix)</b> Signing the contract		<b>ix)</b> Project implementation	
	<b>x)</b> Financial closure			
	<b>xi)</b> Project implementation			

### Quality Score

**Fail** = No serious attempt to address the question

**Not Clear** = It is not clear whether the project could be best implemented by the public sector / private sector

**Pass** = It is clear why either the public sector / private sector would be the best implementer of this project proposal

## Section 3: Financial and Economic Information

*In this section, estimates must be shown of all capital, operational and maintenance costs necessary in order to realize the project. (all amounts in JOD). PIM may ask MoF for their opinion in terms of financial affordability. It is recognized that in larger projects, it is more difficult to estimate costs at an early stage prior to feasibility studies being made, however 'best endeavours' should be employed using precedent costs and as a principle should aim to include more contingency to cover unknown future costs.*

### 3.1 Estimated Total Capital Cost to complete the project

*Costs must include, in addition to construction costs, pre-construction costs such as feasibility studies, architecture and engineering, land acquisition / expropriation / compensation and settlement costs, and the costs of all materials, equipment and services (including consultant costs) necessary to complete the project. The capital costs must be estimated to the best ability of the proposing authority and the source or basis for these estimates should be shown or attached as separate documents.*

### 3.2 Capital Requirement for each year

(total must equal the amount shown above)

*Costs for the first year during which disbursements are expected to be made should be shown even if it is only to pay for a feasibility study. Future years' figures should include the estimated disbursement in the case of multi-year implementation or phased projects. Please add additional years for extended period projects. State the exact year in all cases.*

Fiscal Year	Amount Required
.....	.....
.....	.....
.....	.....
.....	.....

### 3.3 Sources of Capital Funding

*Use the table below to input all sources of capital funding for the project by amount in JOD and also as a percentage.*

Type of Finance	Amount (JOD)	Amount (%)
Treasury		
External project loan		
External Grant Aid		
Domestic Borrowing		
Sales Revenue		
Tolls and Fees		
Community Contribution		
<b>Total</b> (calculated values)		

### Quality Score

**Fail** = The information is not realistic or credible

**Not Clear** = The information may be credible but requires clarification

**Pass** = The data is clear and estimates provided seem realistic

*Note that the Quality Score applies to the combined responses to questions 3.1; 3.2 and 3.3.*

<b>3.4 Annual Operating Costs (JOD):</b> <i>The estimated on-going operating (recurrent) costs required to sustain the project over its useful life must be estimated and expressed as: [x amount] of JOD operating costs per annum. The figure should include costs for salaries, utilities, maintenance, supplies and materials etc. <u>The source or basis for these estimates must be shown or can be attached as a separate document if necessary.</u> As shown below, the operating costs should be expressed in terms of how much can be paid from the proposing authority (administrative unit) regular running costs and how much will be additional cost.</i>		<b>Quality Score</b>  <b>Fail</b> = The information is not realistic or credible <b>Not Clear</b> = The information may be credible but requires clarification <b>Pass</b> = The data is clear and estimates provided seem realistic
Total Estimated Annual Operating Costs of the Project <i>State the total estimated cost of operating the project for the first full fiscal year.</i>		<i>Note that the Quality Score applies to the combined responses to questions 3.4; and 3.5.</i>
How much of this will be recovered from the existing budget? <i>Some projects involve replacing existing facilities meaning that there is already a budget attached to an old or previous facility. If this is the case enter here the amount in the existing budget. If the project is completely new, with no related previous budget, please enter '0' here.</i>		
New operating costs (calculated value)		
<b>3.5 Sources of additional operating and maintenance costs:</b> <i>State here how the additional operating costs will be funded. This should amount to the same figure as shown above in 'New operating costs (calculated value)'. When sources other than Treasury funding are anticipated please add evidence of the offer to do so. This could be in the form of a letter of intent or email exchange. Sales revenues, tolls and fees should have calculated values and assumptions to support the predicted values of the income</i>  <i>( ) Treasury</i> <i>( ) External Loan</i> <i>( ) External Grant</i> <i>( ) Domestic Borrowing</i> <i>( ) Sales Revenue</i> <i>( ) Tolls and Fees</i> <i>( ) Community Contribution</i>		

<p><b>3.6 Is land expropriation required?</b> (Yes / No)  <b>If 'YES', state the total expenses required to achieve this</b>          (compensation / re-settlement costs etc)</p> <p><i>Simply write 'YES' or 'NO' here depending on which is the case. In the case of a 'YES' answer, this amount should already have been included in the total values shown at 3.1 and 3.2 but <u>should be identified separately here</u>.</i>  <i>If expropriation is required in order to realize the project, this must be made clear at this point. The estimated cost of the entire expropriation should also be included here and should include all compensation and re-settlement costs if necessary.</i></p> <p><i>The total cost of expropriation is estimated at:</i></p> <table border="1" data-bbox="761 619 1166 709"> <tr> <td></td> <td>JOD</td> </tr> </table>		JOD	<p><b>Quality Score</b></p> <p><b>Fail</b> = The information was provided but does not seem realistic  <b>Not Clear</b> = The information provided may be realistic but requires clarification  <b>Pass</b> = The information is clear and appears to be realistic</p>						
	JOD								
<p><b>3.7 Will the project generate revenues?</b> (Yes / No)  <b>If 'YES' provide the estimated revenues, their sources and the anticipated project IRR:</b></p> <p><i>Answer either 'YES' or 'NO' here.</i>  <i>If the answer is NO' move to the next section.</i>  <i>If the answer is 'YES' meaning that revenues are anticipated (e.g. fees from use of the facility or sales from goods produced) they should be estimated and expressed as JOD per annum according to the table below. If the first operational year is a part year as is often the case, the reduced values should be shown with the following three full years' estimates.</i></p> <table border="1" data-bbox="272 1144 1166 1241"> <tr> <th>1st operational year</th> <th>Year 2</th> <th>Year 3</th> <th>Year 4</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>	1st operational year	Year 2	Year 3	Year 4					<p><b>Quality Score</b></p> <p><b>Fail</b> = The information was provided but does not seem realistic  <b>Not Clear</b> = The information provided may be realistic but requires clarification  <b>Pass</b> = The information is clear and appears to be realistic</p>
1st operational year	Year 2	Year 3	Year 4						
<p><b>Sources of Revenue:</b>  <i>State here where the anticipated revenue will come from. The answer given here should concur with the information given in sections 3.3 and 3.5.</i></p> <p><b>Anticipated Project IRR:</b>  <i>State here the estimated project IRR based on the revenue figures shown in the table above. Calculations should be shown in all cases.</i></p>									
<p><b>3.8 What is the economic benefit and project net present value NPV in JOD – if applicable</b>  <i>Include, if they are available, any information regarding expected benefits. For example, it is expected that the road improvement will generate savings in maintenance costs for substitute roads</i></p> <p><i>Include, if they are available indicators of evaluation criteria (NPV)</i>  <i>State any information about the economic profitability of the project, estimated based on the revenue figures shown above in 3.7</i></p>	<p><b>Quality Score</b></p> <p><b>Fail</b> = The information was provided but does not seem realistic  <b>Not Clear</b> = The information provided may be realistic but requires clarification  <b>Pass</b> = The information is</p>								

	clear and appears to be realistic
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## 4. Implementation

*This section should provide evidence that a basic implementation plan has been considered. Although detail will not be possible or necessary at this early stage, basic planning will require consideration of the main challenges in implementing the project even though this may be adjusted as detailed planning progresses.*

*Basic information at this stage should include a timeline for implementation and a consideration of the risks involved in implementing the project effectively as well as a consideration of engagement with stakeholders in the project. The proposed governance and decision-making process should be explained with clear roles and responsibilities. This should also identify which official is ultimately accountable for the project.*

### 4.1 Outline the planned timing of the project:

*All the important stages of project preparation and implementation should be listed in the table below with the planned target dates to achieve each one:*

Stage	Target Date
Preparation Feasibility / Appraisal Complete	
Procurement Notice	
Award of Contract	
Works Begin	
Works Finalize	
Project becomes Operational	

### Quality Score

**Fail** = Timings are not credible

**Not Clear** = The plan presented appears credible but requires clarification

**Pass** = The plan is clear and appears to be realistic.

### 4.2 List the human resources, goods, works and services necessary for the implementation and operation of the project. How will they be made available on time?

*The answer given to 4.2 should first and foremost justify the Target Dates shown in 4.1 above.*

*The physical resources necessary to implement the project in the required timescale should be listed here with approximate quantities and lead times for procuring them. State whether these resources are available domestically or might need to be imported; from where and what availability is possible. For example, there is no point in planning for a 12-month completion on a project if a key piece of technical equipment might not be available on site for 14 months.*

*Resources can include manpower, technical advice, plant and equipment; building materials and technical equipment required for the commissioning of the project.*

*An example of this might be a renewable energy project that requires specialized equipment to be procured, designed, manufactured and shipped to Jordan from another country. The time it takes to complete all these steps will have a significant bearing on the date by which the project becomes operational.*

### Quality Score

**Fail** = No serious attempt to address the issues

**Not Clear** = List of resources provided but no consideration of how they will be made available

**Pass** = Resources are listed with a credible acquisition plan

<p><b>4.3 What previous experience does the proposing body have in implementing similar projects? In the case of limited or no experience, explain how this issue will be addressed or mitigated.</b></p> <p><i>If the proposing authority has previous experience of implementing similar projects (for example 'repeat' projects like clinics or schools) this offers a high degree of confidence that the proposed project can be delivered well if it is approved for funding. The proposing authority should list the similar projects that it has successfully implemented over the previous 5 years. Conversely if there has been no previous experience or the proposed project contains significant levels of innovation, this will be seen as potentially risky in terms of successful delivery. In this case, the proposing authority should describe the measures (for example hiring specialist staff or external consultants) that would improve the prospects for success.</i></p>	<p><b>Quality Score</b></p> <p><b>Fail</b> = No previous experience and no credible mitigation</p> <p><b>Not Clear</b> = No previous experience but mitigation might address the issue with further work</p> <p><b>Pass</b> = Previous relevant implementing experience is listed and can be verified <b>OR</b> No previous experience but the proposed mitigation measures appear credible.</p>
<p><b>4.4 List the agencies, utilities or regulatory institutions that will need to be involved in the implementation of the proposed project and what legal issues will need to be addressed?</b></p> <p><i>Many implementation problems arise due to the need for liaison with utilities and regulatory bodies not being addressed at an early enough stage. This is a common cause for delays in many projects across the world and early planning and contact with these bodies will help to plan the work and negotiations required to keep a project on track. Therefore, please list all the agencies, utilities and regulatory bodies that will need to be consulted – in particular but not exclusively – the Ministry of Construction. Also write a very brief description of the legal / regulatory /permitting / institutional issues that need to be discussed with each of these bodies.</i></p>	<p><b>Quality Score</b></p> <p><b>Fail</b> = No credible response</p> <p><b>Not Clear</b> = Institutions listed but with some obvious gaps on legal / institutional issues</p> <p><b>Pass</b> = All likely institutions are listed with clear information on legal / institutional issues to be addressed</p>

<p><b>4.5 List the stakeholders in the project and state whether they have been consulted</b></p> <p><i>'Stakeholders' are interested parties in the project. They are either persons or representative bodies that have an interest in the outcome of the proposal or those that may be affected by it. List them here.</i></p> <p><i>Against each of the stakeholders, indicate whether they have been consulted and if so, in a word or two, whether they support or do not support the project. This can be ascertained through initial contact / consultation.</i></p>	<p><b>Quality Score</b></p> <p><b>Fail</b> = No stakeholders are listed</p> <p><b>Not Clear</b> = Stakeholders are listed but no consultation has taken place so far or the stakeholder list appears incomplete</p> <p><b>Pass</b> = Stakeholders list appears complete and initial consultation has started</p>
<p><b>4.6 Potential risk assessment and mitigation</b></p> <p><i>Briefly describe any potentially significant risk (environmental, social, stakeholder's impact) that may need further investigation and suggest possible mitigation measures where likely to be necessary.</i></p>	<p><b>Quality Score</b></p> <p><b>Fail</b> = No serious attempt to address the issues</p> <p><b>Not Clear</b> = List of risks provided but no consideration of how they will be mitigated</p> <p><b>Pass</b> = Risks are listed with a credible mitigation plan</p>
<p><b>4.7 Potential operational budget constraints</b></p> <p><i>Explain how operating, maintenance and depreciation expenses are expected to be covered once the project is completed, indicating whether user charges must be implemented or raised.</i></p> <p><i>Identify if project sustainability can be compromised by a shortage of funding for operation and/or maintenance or by critical weaknesses in the capacities in the operating entity that are unlikely to be resolved in time for project completion.</i></p>	<p><b>Quality Score</b></p> <p><b>Fail</b> = No serious attempt to address the issues</p> <p><b>Not Clear</b> = List of constraints provided but no consideration of how they will be resolved</p> <p><b>Pass</b> = Constraints are listed with a credible resolution plan</p>
<p><b>4.8 In the event of a successful pre-screening, for projects that require a feasibility study or pre- feasibility study</b></p> <p><b>A. What budget would be required for a (pre)feasibility study?</b></p> <p><i>Please estimate the total costs for completing a feasibility study for the project. Since larger projects also need a pre-feasibility study, also include this cost-estimate.</i></p>	

**B. What is the source of funding for the (pre)feasibility study?**

*Where will the funding for the (pre) feasibility study come from? Be precise about the source of funding particularly if it is being co-financed. If the (pre)feasibility study is being funded externally, please provide supporting evidence (in writing) of the external funder's intent to fund.*

**C. Describe how the preparations / feasibility study will be completed**

*Describe here what activities would need to take place between notification of a successful PCN and the completion of the feasibility study. This should include approximate time-lines and include realistic estimates of procurement lead times. The completion date for the preparations and (pre) feasibility study should also be estimated here*



