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Report No: PAD5170

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED IBRD LOAN IN THE AMOUNT OF US$200 MILLION

AND A PROPOSED GLOBAL CONCESSIONAL FINANCING FACILITY GRANT
IN THE AMOUNT OF US$50 MILLION

TO THE

HASHEMITE KINGDOM OF JORDAN

FOR THE

JORDAN WATER SECTOR EFFICIENCY PROJECT

May 24, 2023

Water Global Practice
Middle East And North Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective May 1, 2023)

Currency Unit =	JD
JD =	US$1.41
US$ =	0.71 JOD

FISCAL YEAR
January 1 - December 31

Regional Vice President:	Ferid Belhaj
Country Director:	Jean-Christophe Carret
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ABBREVIATIONS AND ACRONYMS

AAC	Aqaba-Amman National Desalination and Conveyance Project
AFD	Agence Française de Développement
AM	Accountability Mechanism
AWC	Aqaba Water Company
CCDR	Country Climate and Development Report
CERC	Contingent Emergency Response Component
COVID	Coronavirus disease of 2019
CPF	Country Partnership Framework
DAP	Drought Action Plan
DMA	District Metered Area
EBRD	European Bank for Reconstruction and Development
EE	Energy Efficiency
EFF	Extended Fund Facility
EIB	European Investment Bank
EnMS	Energy Management System
ERR	Economic Rate of Return
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESMF	Environmental and Social Management Framework
ESRS	Environmental and Social Review Summary
ESSD	Environmental and Social Standards Directorate
FM	Financial Management
FR	Financial Reports
FSR	Financial Sustainability Roadmap
GCFF	Global Concessional Financing Facility
GDP	Gross Domestic Product
GFMIS	Government Financial Management Information System
GHG	Greenhouse Gas
GIS	Geographic Information System
GIZ	Gesellschaft für Internationale Zusammenarbeit
GOJ	Government of Jordan
GRS	Grievance Redress Service
GWh	Gigawatt Hour
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IMF	International Monetary Fund
IPF	Investment Project Financing
IVA	Independent Verification Agency
JICA	Japan International Cooperation Agency
JVA	Jordan Valley Authority
KfW	Kreditanstalt für Wiederaufbau
kWh	Kilowatt-hour
LMP	Labor Management Procedures
lpd	Liters per person per day
M&E	Monitoring and Evaluation
KPI	Key Performance Indicator
m3	Cubic meters
MCM	Million cubic meters
MW	Megawatt
MWC	Miyahuna Water Company
MWI	Ministry of Water and Irrigation
NDCs	Nationally Determined Contributions
NPV	Net Present Value
NRW	Non-Revenue Water
NWS	National Water Strategy
O&M	Operation and maintenance
OP	Operations Policy
PBC	Performance-Based Conditions
PDO	Project Development Objective
PIU	Project Implementation Unit
PMU	Project Management Unit
POM	Project Operations Manual
PPP	Public-Private Partnership
PPSD	Project Procurement Strategy Development
RE	Renewable Energy
RF	Resettlement Framework
SCADA	Supervisory Control and Data Acquisition
SEP	Stakeholder Engagement Plan
SOP	Series of Projects
SOP-1	First Project in the Series of Projects
TA	Technical Assistance
tCO2	Tons of Carbon Dioxide
TWW	Treated Wastewater
UPMU	Utilities Performance Management Unit
USAID	United States Agency for International Development
WAJ	Water Authority of Jordan
WC	Water Company
WPI	Women Plumber Initiative
WWAC	Wise Women Association and Cooperation
YWC	Yarmouk Water Company

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DATASHEET

BASIC INFORMATION

Country(ies)	Project Name
Jordan	Jordan Water Sector Efficiency Project

Project ID	Financing Instrument	Environmental and Social Risk Classification
P176619	Investment Project Financing	Substantial

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[✓] Contingent Emergency Response Component (CERC)
[✓] Series of Projects (SOP)	[ ] Fragile State(s)
[✓] Performance-Based Conditions (PBCs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made Disaster
[ ] Alternate Procurement Arrangements (APA)	[ ] Hands-on Enhanced Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
15-Jun-2023	31-Dec-2028

Bank/IFC Collaboration

No

Proposed Development Objective(s)

The project development objective (PDO) is to improve the efficiency of water services in Jordan

Components

Component Name	Cost (US$, millions)

Component 1. Sustainable non-revenue water reduction	209.00
Component 2. Increased energy efficiency and reduced energy supply costs	54.00
Component 3. Water security measures to underpin efficiency improvements	27.00
Component 4. Project management and implementation support	10.00
Component 5. Contingent Emergency Response Component	0.00

Organizations

Borrower:	Hashemite Kingdom of Jordan
Implementing Agency:	Ministry of Planning and International Cooperation, Hashemite Kingdom of Jordan Ministry of Water and Irrigation, Hashemite Kingdom of Jordan

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	300.00
Total Financing	250.00
of which IBRD/IDA	200.00
Financing Gap	50.00

DETAILS

World Bank Group Financing

International Bank for Reconstruction and Development (IBRD)	200.00

Non-World Bank Group Financing

Trust Funds	50.00
Concessional Financing Facility	50.00

Expected Disbursements (in US$, Millions)

WB Fiscal Year	2023	2024	2025	2026	2027	2028	2029

Annual	0.00	5.00	17.00	40.00	50.00	58.00	30.00
Cumulative	0.00	5.00	22.00	62.00	112.00	170.00	200.00

INSTITUTIONAL DATA

Practice Area (Lead)

Water

Contributing Practice Areas

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Moderate
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	Low
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Substantial
7. Environment and Social	Substantial
8. Stakeholders	Moderate
9. Other	Low
10. Overall	Moderate

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
Assessment and Management of Environmental and Social Risks and Impacts	Relevant
Stakeholder Engagement and Information Disclosure	Relevant
Labor and Working Conditions	Relevant
Resource Efficiency and Pollution Prevention and Management	Relevant
Community Health and Safety	Relevant
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
Cultural Heritage	Relevant
Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

Legal Covenants

Sections and Description

Article IV, Section 4.01: The Co-financing Deadline for the effectiveness of the Co-financing Agreement is 4 months from the Effective Date, or such later date to be agreed with the World Bank.

Sections and Description

Schedule 2, Section I.A.3: The Borrower shall, no later than three (3) months after the Effective Date, or such later date as agreed by the Bank, establish and maintain, throughout Project implementation, an oversight and coordination committee chaired by MOPIC ("Oversight and Coordination Committee" or "OC Committee") with

composition, terms of reference and roles and responsibilities acceptable to the World Bank.

Sections and Description

Schedule 2, Section I.A.2 (a): The Borrower, through MOWI and MOPIC, shall cause WAJ to maintain throughout Project implementation, the Project Management Unit ("WAJ-PMU"), responsible for the day-to-day implementation (including financial management, procurement, technical assistance, and environmental and social aspects) of the Project, with functions, responsibilities and sufficient resources acceptable to the Bank. (b) By not later than six (6) months after the Effective Date, or such later date as agreed by the Bank, the Borrower, through MOWI and MOPIC, shall cause WAJ to contract or assign for the WAJ-PMU the following additional staff, with qualifications and terms of reference satisfactory to the Bank and as set forth in the Project Operations Manual ("POM") for the implementation of the Project including: project manager, financial management, procurement, technical, and environmental and social specialists.

Sections and Description

Schedule 2, Section I.D.1: The Borrower through MoWI and MOPIC shall cause WAJ, through the WAJ-PMU, no later than four (4) months after the Effective Date, or such later date as agreed by the World Bank, prepare and adopt, and ensure the carrying out of the Project in accordance to a manual acceptable to the World Bank ("Project Operations Manual" or "POM") satisfactory to the World Bank, setting forth rules, methods, guidelines, and procedures for the carrying out of the Project.

Sections and Description

Schedule 2, Section I.H.1: For purposes of implementing PBC#1 to PBC#5 under Part 1.2, Part 1.3, Part 3.1 and Part 3.2 of the Project, the Borrower shall cause WAJ to engage an independent verification agency by no later than six (6) months after the Effective Date, with such qualifications and experience as determined in the Verification Protocol and acceptable to the World Bank.

Sections and Description

Schedule 2, Section I.A.4: the Borrower shall, no later than three (3) months after the Effective Date, or such later date as agreed by the Bank, establish and maintain, throughout Project implementation, a technical committee chaired by the MOWI ("Steering Committee") with composition, terms of reference and roles and responsibilities acceptable to the World Bank.

Conditions

Type	Financing source	Description
Effectiveness	Trust Funds, IBRD/IDA	Article V., 5.01(a): The WAJ Subsidiary Agreement has been executed and delivered, and all conditions precedent to its effectiveness or to the right of WAJ to make withdrawals under it (other than the effectiveness of this Agreement) have been fulfilled; and (b) The JVA Cooperation Agreement has been executed and delivered, and all conditions precedent to its effectiveness (other than the effectiveness of this Agreement) have been fulfilled.

I. STRATEGIC CONTEXT

A. Country Context

1. **Following a relatively moderate contraction, Jordan's economic recovery in 2021-2022 has been steady.** Economic growth has been at or below 3 percent for the last decade due to a number of economic shocks: interruptions in natural gas supply in 2011 caused a jump in electricity production costs; and from 2011 to 2015, an estimated 1.3 million refugees fled to Jordan from the conflict in Syria, equivalent to 17 percent of Jordan's 2011 population.[1] This is added to the more than 2 million registered Palestinian refugees who live in Jordan, with the roots of their refugee status based on regional conflicts in the 1940s – 1960s.[2] The slowdown in the major Gulf economies (because of depressed oil prices in 2014) led to a drop in remittances, lower official grants to Jordan as well COVID-19 restrictions and cautionary saving which caused domestic revenues to decline at the end of the last decade.[3] The full reopening of the economy, easing of COVID-related restrictions, international tourism and improving exports led to an economic recovery with 2.7 percent (year-on-year) real gross domestic product (GDP) growth during the first three quarters of 2022. However, growth is projected to remain modest, due to the ongoing Russia's invasion of Ukraine causing uncertainty with global commodity prices coupled with the fact that Jordan is one of the most import-dependent countries in the world, and the ongoing structural issues such as the current account deficit and high unemployment. Progress on poverty reduction has been limited in recent years due to continued crises, slow economic growth and lack of job creation. Water scarcity is a key impediment to growth, development and poverty reduction in Jordan, a factor which is expected to be exacerbated by climate change.[4]

2. **Jordan's unemployment is high, particularly among youth and women.** Unemployment has nearly doubled since 2014 and now stands at 22.6 percent, the result of the slow growth and economic shocks which have affected the economy's ability to create the large number of jobs required to meet the needs of the young and fast-growing population. Jordan's agri-food sector is an important source of income and employment, especially the 25 percent of Jordan's poor who rely on agriculture for their income, and refugees who most commonly work in agriculture.[5] Jordan ranks among the countries with the lowest labor market participation rates for women in the world, followed only by the war-torn Syrian Arab Republic and the Republic of Yemen.[6] The women's labor force participation rate is 14 percent compared to about 53.6 percent for men, yet female literacy rate is quite high (98.3 percent), with 57.3 percent of tertiary education being female graduates.[7] Women comprise only 11 percent of water sector employees, and only 17.5 percent of leadership and supervision positions within these entities, where major barriers to gender equity in employment in the sector are related to barriers to retention and advancement of women.[8] According to the Department of Statistics, 7 percent of businesses are owned or co-owned by women and businesses owned by women are limited and tend to be small, seasonal, informal and home-based, confined in low productivity activities and with limited access to markets. Professional certifications that relate to work on household issues combined with training on practical skills and provision of the necessary equipment, can support women in finding employment opportunities

[1] Approximately 675,000 of the approximately 1.3 million displaced Syrians in Jordan are registered with the United Nations High Commissioner for Refugees (UNHCR) with approximately 200,000 registered Syrian refugees in Amman (September 2022).
[2] 18 percent of recognized Palestinian refugees live in the ten recognized Palestine refugee camps throughout the country
[3] Youssef, Hoda; Janzer-Araji, Anastasia; Mazahreh, Jad Raji. Jordan Economic Monitor - Fall 2022: Public Investment - Maximizing the Development Impact (English). Jordan Economic Monitor Washington, D.C. : World Bank Group.
[4] World Bank (2022) Jordan Country Climate Development Report (2022)
[5] ILO (2018) Decent Work and the Agriculture Sector in Jordan: Evidence from Workers' and Employers' Surveys, Jordan, 2018 https://www.ilo.org/wcmsp5/groups/public/---arabstates/---ro-beirut/documents/publication/wcms_646170.pdf
[6] World Bank 2020. World Bank, 2020, State of the Mashreq Women. http://pubdocs.worldbank.org/en/868581592904029814/State-of-the-Mashreq-Women.pdf
[7] Jordan Department of Statistics, 2022. *http://dos.gov.jo/dos_home_a/main/archive/unemp/2022/Emp_Q42022.pdf*
[8] The Status of Women in Jordan's Water Sector (2018). USAID Water Management Initiative.

which can help overcome some of the school-to-work transition barriers and the restrictive social norms, and create pathways for enhancing women's opportunities to generate income.

3. **The recent combination of shocks to the already stressed water and energy sectors led to a sharp rise in sector debt impacting the sustainability of service delivery as well as the country's fiscal position.** The influx of Syrian refugees has severely strained basic service delivery, including water supply services, as utilities had to expand output to meet the increasing demand. Interruptions in natural gas supply from Egypt in 2011, which fueled about 90 percent of Jordan's power generation, forced the country to make a rapid shift to other electricity production methods causing a jump in electricity prices and sharply increasing supply costs as electricity accounts for almost half of all operating costs of the water sector.[9] Significant energy is inherently required for pumping water to urban and agricultural areas because of Jordan's natural hydrogeology and topography, and ageing infrastructure only increases the high energy requirements of the sector. The water sector is the largest single energy consumer in Jordan, and half of water utilities' operational costs are for electricity. These dual shocks led to a sharp rise in sector debt impacting both the sustainability of services delivery as well as the country's fiscal position.[10]

4. **Reform of both the energy and water sectors has been supported by international partners, including through budget support, but financial sustainability and service provision risks remain.** Measures to support Jordan's medium-term fiscal sustainability continue to be key for Jordan and its ability to continue to play a role as a host country in the region. Water sector reform is an important element of the International Monetary Fund (IMF) Extended Fund Facility (EFF) as the sector is a major contributor to Jordan's overall macro-fiscal imbalances and is a large source of contingent liabilities in Jordan.[11,12] Energy and water sector reforms are central parts of the Jordan Reform Matrix (2018-2024) as they are recognized as important drivers for economic competitiveness and growth. The Water Sector Financial Sustainability Roadmap (FSR) (approved by Cabinet of Ministers in November 2022), a deliverable under the Reform Matrix and a commitment in the IMF's EFF, provides the Government's planned path for reducing the accumulation of debt in the sector.[13] It outlines policy and investment actions needed to improve overall financial sustainability and operational performance of the sector, focusing particularly on closing the operational deficit in the water sector by 2030.

B. Sectoral and Institutional Context

5. **Jordan is one of the most water scarce countries in the world, which poses severe constraints on the country's economic and human development.** Water resources are concentrated in the northern highlands and the Jordan River Valley, with over 92 percent of the land in Jordan classified as semi-arid or arid and receiving less than 200 mm of rainfall per year. At only 97 m^3 per capita per year, available water is well below the absolute water scarcity threshold of 500 m^3 per capita per year.[14] Jordan has seen its population grow through a combination of organic growth and refugee influxes from 2 million in 1975 to around 11 million in 2021– reducing the amount of water available per person.[15] While more than 99 percent of people have access to improved water sources, around half receive water for less than 24 hours per week and the other half are receiving water for 24-48 hours per week due to

[9] The water sector uses an estimated 16 percent of electricity produced in Jordan.
[10] Registered as a combination of debt and trade payables on utilities' financial statements.
[11]This EFF follows the successful completion in August 2015 of the IMF's SBA) which supported a fiscal consolidation program that helped stabilize and improve confidence in Jordan's macroeconomic framework during 2012–2015.
[12] The current EEF is US$1.3 billion, and it is expected to end in 2024. It includes structural benchmarks for: (a) streamlining tax system and granting of tax incentives and closing tax loopholes; (b) stabilizing operating balance of the NEPCO; (c) applying Public Investment Management and procurement reforms; and (d) and improve ex-post audits and public access to information.
[13] The fifth review of the IMF EEF welcomed the Government's planned path as defined by the FSR.
[14] Rapid Assessment of the Consequences of Declining Resources Availability and Exploitability for the Existing Water Supply Infrastructure (2020). MWI | WAJ | JVA | GIZ
[15] https://data.worldbank.org/country/jordan

limited water availability.[16,17] During periods of climate change exacerbated water scarcity, leading to drought such as those witnessed in 2021 and 2022, water rationing reduces service provision to as low as 70 liters per person per day (lpd).[18] Women are more affected by water scarcity and intermittent supply, which impacts on tasks that are traditionally within women's purview such as ensuring basic hygiene, ability to cook, wash, and care for family members. As Jordan's population has grown and become increasingly urbanized (92 percent in 2021) around half of Jordan's available water is used for domestic water supply (including industry) and the other half is allocated to agriculture (compared with a worldwide average of 70 percent of water for agriculture).[19] Projections that underpin the 2022 update to the National Water Strategy (NWS) shows that water demand will exceed available water by more than 20 percent by 2025 with a projected deficit of 40 percent by 2040 without further intervention.

6. **Climate change and population growth will further reduce per capita water resources availability by 30 percent by 2040.**[20] In Jordan, and across the Middle East, many of the effects of climate change on the water cycle are already observed and are expected to worsen, as highlighted in the Jordan Country Climate and Development Report (CCDR): (i) higher temperatures and more intense and frequent extreme heat events, which will increase aridity, increase evapotranspiration rates and will decrease soil moisture; (ii) decreased total rainfall and accordingly, decreased surface water flows and decreased groundwater recharge which will result in less overall water availability and less water stored in reservoirs and aquifers; (iii) increasing spatial and temporal variability in precipitation, including increased frequency and intensity of flood events, particularly flash flooding, as well as increased frequency and duration of drought events.[21] This combination of detrimental effects exacerbated by climate change will reduce the overall water availability, increase the frequency of drought events, while simultaneously increasing demand for irrigation water and municipal water. Given that Jordan's water supply is managed and allocated at the nationwide, system level, climate impacts on surface water availability affect the whole country's irrigation and municipal water availability. The increasing frequency and intensity of drought events will make prediction of water availability more difficult, intensifying challenges with water security and exacerbating the current pressure on water allocation and stakeholder engagement systems.

7. **The influx of Syrian refugees, in addition to the existing population of refugees from Palestine, has severely strained water service delivery.** Water utilities – already under strain before the refugee crisis – had to expand output to meet increasing demand for services from refugees and bulk water availability is limited in Jordan, so service continuity to the host communities was severely impacted after the refugee influx.[22][23] Water service in refugee camps is operated by UNICEF for Syrian refugees and by UNRWA for Palestinian refugees, based on an agreed allocation of water for service in camps. However, overall water scarcity challenges make it a challenge for the Water Authority of Jordan (WAJ) to provide the agreed volume of bulk water. Refugees who are integrated into the resident population receive water services at the household level, with very high levels of access to water services, but face the same intermittent supply challenges as the host community. However, refugees and their host communities, particularly

[16] The WHO/UNICEF Joint Monitoring Data. 2020 data. https://washdata.org/data
[17] Ministry of Water and Irrigation (2020). Jordan Water Sector Facts and Figures 2020
[18] Compare with 50-100 lpd required to the basic minimum daily human requirement and typical high-income standards of 350-400 lpd
[19] https://data.worldbank.org/country/jordan
[20] 2020 GIZ. Rapid Assessment of the Consequences of Declining Resources Availability and Exploitability for the Existing Water Supply Infrastructure
[21] World Bank (2022). Jordan Country Climate and Development Report. https://openknowledge.worldbank.org/handle/10986/38283
[22] At the onset of the refugee crisis Jordanian water utilities were already suffering a supply shock driven by a hike in energy costs. The Arab Gas Pipeline, which fueled more than 90 percent of Jordan's power generation through natural gas imports from Egypt, was sabotaged in 2011. With subsequent natural gas shortages, Jordan was forced to switch to more expensive and less efficient diesel and heavy fuel oil during a time of rising global oil prices.
[23] World Bank. 2020. The Fallout of War : The Regional Consequences of the Conflict in Syria. Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/33936 License: CC BY 3.0 IGO.

those in the host community living at or below the poverty line, are sensitive to small shocks, including limited water services, water rationing and drought. Over 26 percent of refugees who do not live in a refugee camp report having insufficient household water storage to cover all family needs (hygiene, cooking, cleaning) and 11 percent of Syrian refugees report water trucks as their main source of drinking water.[24,25] Refugees are most commonly employed in agriculture and provide the majority of seasonal and informal labor in Jordan, making their employment vulnerable to droughts.[26] See Annex 4 for information on refugees and the water sector in Jordan.

8. **The Government of Jordan (GOJ) has been proactive in the analysis of these water scarcity challenges and in attempts to formulate a response.** The water sector in Jordan is overseen by the Ministry of Water and Irrigation (MWI). This ministry sets policy for both domestic water supply and sanitation services as well as for irrigation water used in agriculture – whether from surface or ground water. The Jordan Valley Authority (JVA) manages irrigation from surface water and dams that store water for municipal supply and irrigation. Domestic WSS services are managed by three main water companies (WCs): (i) Miyahuna Water Company (MWC) for the greater Amman area; (ii) the Yarmouk Water Company (YWC) for the north of Jordan; and (iii) Aqaba Water Company (AWC) in the south of Jordan. WAJ is an asset holding company for these three companies and a bulk water supplier to the companies. Performance of Water Companies is regularly monitored by the Utilities Performance Management Unit (UPMU) in WAJ, and the UPMU report notes that they need to improve their planning capacity including data management system, customer relationship management, billing system, prepare emergency response plans, reduce in non-revenue water (NRW) and improve their collection efficiency.

9. **Jordan's water challenges require both supply and demand-side responses.** Jordan's limited options for new supply of water are to: (i) desalinate sea water and transfer it a long distance at considerable expense, and/or (ii) purchase water from Israel or other countries which may be less expensive but introduces sovereignty and political concerns. GOJ has explored a variety of options for additional water, including deep aquifers and brackish or large-scale seawater desalination,[27] however, all of the augmentation projects will significantly increase the average cost of water supply. GOJ is focusing on the following initiatives in the sector:

(a) **Efficiency and pricing measures:** In November 2022, the GOJ Cabinet of Ministers approved the FSR for the Water Sector (Annex 6), and finalized its National Water Sector Strategy in March 2023. The FSR outlines a set of policy and investment measures that could close the sector operational deficit and reduce debt accumulation, including energy efficiency (EE) targets, scaling up use of Treated Wastewater (TWW) in agriculture to substitute for freshwater, NRW reduction targets and tariff reforms.

(b) **The National Aqaba-Amman Desalination and Conveyance (AAC) project as an important supply-side investment**: The AAC project is intended to augment water supply in Jordan. The AAC includes a desalinization plant (Aqaba) and a water conveyance system. It will deliver 300 million cubic meters (MCM) per year of water to Amman and cities along the conveyance corridor, meeting projected urban water demand in 2030. This project will require 300 MW of installed electricity generation capacity – enough to increase Jordan's peak energy demand by about 10 percent and double the energy consumption of the water sector, which currently accounts for 16 percent of total electricity consumption in Jordan.

[24]UNHCR Socio-economic situation of refugees in Jordan Q3 2022
[25] UNHCR VAF Survey 2021
[26] The highly water dependent agriculture sector contributes 5.6 percent of GDP, while the broader agri-food sector contributes about 20-25 percent of GDP (Netherlands Enterprise Agency, 2016). Jordan's agri-food sector is an important source of employment and income, currently, primary agriculture and the wider agri-food sector represent 3 percent and 14 percent of formal employment, respectively; these subsectors also make a significant contribution to livelihoods through large numbers of informal employment opportunities.
[27] The only option not fully considered to augment supply is direct reuse of TWW for potable water needs.

10. **Loss reduction, conservation and reuse of treated wastewater (TWW) are prioritized in the FSR and NWS as important efficiency and demand control measures**. Approximately 50 percent of municipal water is lost as NRW in Jordan (compare with an acceptable loss rate of around 20 percent for a similar operating environment). NRW reduction interventions over the past decade have made steps toward reducing these losses, however, a holistic approach coupled with institutional strengthening and maintenance is needed to mobilize and sustain gains at scale. Through conservation measures in the irrigated agriculture sector, water productivity has improved steadily in Jordan over the recent decades leveraging a combination of water saving technologies and water saving policies. Jordan leads the region in water reuse for irrigated agriculture, with a quarter of the water for agriculture being generated from TWW. However, despite these gains, groundwater is pumped well beyond sustainable yields and farmers regularly experience an irrigation deficit, underlining the need for an allocation system that can be monitored and enforced. Rehabilitation and sediment management actions are needed to ensure the continued safe functioning of the King Talal dam, an essential part of the TWW reuse system in Jordan as it is necessary for blending and timing of deliveries of TWW for use in agriculture. Industrial and household-level conservation are also prioritized in the NWS as a means of controlling demand. Jordan's Nationally Determined Contributions (NDCs) highlights priority water-related adaptation measures such as maximizing TWW re-use in agriculture, ensuring plans for groundwater protection and management, reducing water losses in distribution pipes, introducing water metering and water saving technologies, reforming water pricing, among others.[28]

11. **Water security measures such as informed water allocation practices and storage rehabilitation are needed to better manage bulk water systems that underpin water supply and irrigation service delivery.** Jordan experiences high levels of year-on-year variation in rainfall (+/- 50 percent) and frequent drought (8 drought years in 30 years), and climate projections indicate that drought frequency will increase three-fold by the end of the century.[29] Water storage systems play an important role in an efficient response to highly variable precipitation as they allow water managers to store water during higher rainfall periods for use during dry periods. Rehabilitation and sediment management is needed for the continued safe and efficient operation of Jordan's reservoirs. Improved water allocation and drought management systems are necessary to ensure that allocation responds to changing conditions, improving beneficial use. Cooperative planning and management of water shortages and clarifying communication channels around water shortages will help stakeholders to respond during periods of scarcity to avoid losses and will help ensure that water allocation decisions are efficient and fair, to reduce economic losses and increase trust between the sector and its stakeholders

12. **Plans for augmenting water supply will worsen the already precarious financial position of the Jordanian water sector and urgent reforms are needed to bring the water sector back into financial equilibrium.** In 2021 the WAJ total revenues from all sources (utilities and other revenues) were equivalent to 78 percent of direct operating expenses. At the end of 2021, the water sector deficit was $US 277 million, and sector debt reached $US 3.8 billion (7 percent of GDP).[30] The planned AAC investment is costly, both in terms of OPEX and CAPEX, underlining the urgency of reform measures in the sector. In response, the FSR outlines a set of no-regrets efficiency measures (Annex 6) that support improved service delivery by securing water lost through leakage, improving EE and substituting TWW for freshwater

[28] Hashemite Kingdom of Jordan Intended Nationally Determined Contribution (INDC)
https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Jordan%20First/Jordan%20INDCs%20Final.pdf

[29] Rajsekhar and Gorelick (2017) predict that multiple drought-type occurrences in Jordan will increase from 8 in 30 years (1981–2010) to 25 in 30 years (2070–2100).

[30] Accumulated debt is a result of a debt service, recurrent deficits and PPPs leveraged to cope with extreme water scarcity. Two PPPs are in operation, the Disi pipeline for bulk water and the As Samra Wastewater Treatment Plant for wastewater treatment and reuse. The Disi pipeline PPP represents contingent liabilities of $US 2,467 million and the total contingent liabilities from both loans and PPPs is $US 5,755 million (13 percent of GDP).

thereby increasing freshwater delivered to municipal supply customers.[31] If it acts quickly, GOJ has the opportunity to mobilize efficiency measures in the existing water distribution system in time to reduce losses and maximize the benefit of the additional water from the AAC. These efficiency measures, coupled with the other policy levers in the FSR (Annex 6) would bring operations and maintenance (O&M) cost recovery to 100 percent by 2030 and reduce sector debt to US$11 billion in 2040, compared to just over $US 20 billion without action.

C. Overview of the Series of Projects (SOP)

13. **The proposed SOP provides the investment support and long-term approach needed to support implementation of the Water Sector FSR to improve the efficiency and resilience of the water sector in Jordan.** Through the SOP, multiple projects financed by the World Bank and other development partners will contribute to the Government's objectives to improve efficiency, service delivery and financial sustainability of the water sector. The SOP is expected to be implemented between 2023 and 2032, through three proposed investments beginning with this Project and followed by two further investments in sector efficiency. Presentation to the Board of subsequent projects in the SOP will be staggered by approximately two years, allowing for preparatory works and institutional reforms envisioned under the FSR to be carried out during implementation periods of the earlier phases. The World Bank team will coordinate closely with the United States, Germany, France, and other partners active in the water sector; and has mobilized co-financing for the SOP, including anticipated co-financing for the first project in the series (SOP-1; US$50 million anticipated from Agence Française de Développement (AFD) and concessional financing in the amount of US$50m from the Global Concessional Financing Facility (GCFF), recognizing the refugee related impacts in the sector).

14. **Mobilizing efficiency investments through a long-term, programmatic approach will provide investment continuity needed for major investment in infrastructure and institutional reform, linking planning with action.** The SOP approach will provide flexibility to adapt design over time as circumstances evolve and will improve financial planning as investment costs are better aligned with advanced and detailed studies. Design and implementation of infrastructure investments concurrent with institutional reform, will be phased and timed within the SOP, where SOP-1 will prepare infrastructure investments implemented in SOP-1 and will also prepare future investments that could be implemented in later phases of the SOP. Leveraging the SOP tool also provides the flexibility of committing the full envelope of financing required after investments readiness is advanced and institutional reform measures required for financial sustainability are initiated.

15. **Program Development Objective**: the development objective of the SOP is to improve efficiency, service delivery and financial sustainability of the water sector. The SOP will operationalize the FSR for the Water Sector. The SOP is also aligned with, and will contribute to, the new Vision for Economic Modernization, Government's National Strategy for the Water Sector and Non-Revenue Water Reduction and Energy Efficiency Strategies.

16. **The SOP will invest in three Focus Areas, shown with the level of ambition and results targets for the Program as shown in Table 1.** Expanded information on the scope of the SOP, anticipated timeline, alignment with plans and strategies, and expected benefits is included in Annex 5.

Table 1. Focus Areas of the SOP and Results Targets

[31] Financing needs for network rehabilitation and NRW reduction are estimated at US$1.8 billion system-wide (reflecting the heavy wear and tear on the distribution network resulting from operating under very low water availability and from deferred maintenance). GOJ is also investing in EE and RE to reduce operating costs ($US 262 million CAPEX ($US 208 million EE and $US 54 million RE) to yield 257 GWh/ year in energy savings while adding 193 MWh/year in RE capacity), mobilizing improvements in collections efficiency, and water security measures needed to sustain current surface water reservoirs.

SOP Focus Area and Activities	SOP Level of Ambition and Results Target Alignment
Loss reduction and service delivery: infrastructure and institutional actions that reduce commercial and physical losses in bulk and primary systems and improve service delivery including distribution network rehabilitation and stabilization, upgrading to smart-utility systems and smart meters and commercial loss reduction actions. Earlier phases of the SOP will prepare NRW reduction and water supply-infrastructure investments that may be mobilized in later stages of the SOP, potentially including. bulk water conveyance systems and reservoirs to improve long-term water security and service delivery.	SOP will reduce NRW by 1 percent for each year in operation[32] SOP will support institutionalization of NRW operations to maintain reduced NRW, including regular monitoring of NRW levels Utility performance improvement is institutionalized with regular performance contracts in place with the holding company
EE and cost reduction: infrastructure and institutional actions that improve EE of the current facilities, well-targeted integration of renewable energy (RE) and improvement of energy load management. Earlier phases of the SOP will prepare investments that may be mobilized in later stages of the SOP.	Contribute to reducing the water supply energy intensity to 5.61 kWh/m3 and to water produced to 2.9 kWh/m3 (as reflected in the 2021 EE and RE Action Plan) Support implementation of peak-load shifting to reduce peak water sector energy demand and utilizing of RE for the benefit of the water sector
Water security and drought management: strengthen water management systems and infrastructure, including grey-water systems, dam safety, water allocation tools and drought management systems. Earlier phases of the SOP will prepare dam safety and rehabilitation investments that may be mobilized in later stages of the SOP.	National water allocations are set on the basis of availability of sustainable supplies aligned to socio-economic priorities. Annual water budget per use is fair, matched to resource availability, reflects public policy, and is effectively monitored Maintain or increase available surface water storage capacity of existing facilities by rehabilitating dams and managing sedimentation

D. Relevance to Higher Level Objectives

17. **The SOP is in line with the World Bank Group's strategic engagement as reflected in the second pillar of the Jordan Country Partnership Framework (CPF)[33] and parts I and IV of the World Bank Gender Strategy (FY16-23).[34]** The SOP aims to improve the quality and equity of service delivery, to the Jordanian population and refugees, including through private sector solutions. These objectives are underpinned by cross-cutting principles that preserve resilience, which the SOP and the first project in the series (SOP-1) are aiming to improve water and sanitation services and enhance the capacity of the sector institutions by restoring financial sustainability. The Performance and Learning Review of the CPF reconfirmed the importance of promoting fiscal sustainability of the water sector (objective 2.1) and included related indicators on financial sustainability and cost recovery.[35] The proposed project contributes to parts I and IV of the World Bank Gender Strategy (FY16-23) related to economic empowerment and agency. The project is aligned with

[32] National NRW reduction targets in FSR = 2%/year; SOP to support half of the NRW investments, nation-wide

[33] World Bank Group. Jordan CPF 2017-2022; Report number: JO-102746.

[34] World Bank Group. FY16-23 Gender Strategy: Gender Equality, Poverty Reduction, and Inclusive Growth; Report number: 102114

[35] World Bank. 2021. Jordan - Performance and Learning Review for the Country Partnership Framework for the Period FY17-FY22. Washington, D.C. : World Bank Group.

the World Bank's Global Crisis Response Framework, particularly with its Pillars II, III and IV*:* through its support to building the capacity of the sector institutions and restoring their financial sustainability, improving drought management and response systems for water security and resilience to climate changes, increasing efficiency of the water use and its reuse and generating energy savings and by supporting Women Plumber Initiative and putting a stronger focus on gender-sensitive procurement.[36]

18. **The SOP also aligns with the GOJ's focus on restoring financial sustainability in the water sector while improving service delivery. The SOP supports the implementation of the water sector FSR and aligns with the draft Financial Sustainability Chapter of the NWS. The SOP is well aligned with the Economic Modernization Vision 2033, contributing to the Sustainable Resources Pillar**. The SOP is also in line with the revised Reform Matrix (approved by Cabinet in November 2022) and specifically support the following reform areas under pillar 10 which includes: 10.1 Enhance and Improve Financial Sustainability of Water Sector; 10.2 Reduce balance of Energy Consumption in the Water Sector; 10.3 Improve water sector governance and planning; 10.4 Reduce NRW; and 10.5 Water Resources Reallocation Strategy.

19. **The SOP aligns with the recommendations of the Jordan CCDR on adapting to increasing water scarcity and higher temperatures.** Among the CCDR recommendations are calls for action on water efficiency and achieving cost recovery for the water sector. Additionally, the CCDR prioritizes investments in: (a) improving the efficiency of the water sector; (b) an economically efficient energy tariff structure that enables a shift in peak energy demand of the water sector; (c) investing in pumped hydro storage; (d) improving water allocation and drought management to enhance water security; (e) scaling up use of TWW in agriculture; and (f) cooperating regionally on energy and water.

20. **The SOP also aligns well with national policies and strategies aimed at reducing greenhouse gas (GHG) emissions and adaptation to climate change.** Among these are:

- Jordan's NDCs highlight priority adaptation measures such as maximizing TWW re-use in agriculture, ensuring plans for groundwater protection and management, reducing water losses in distribution pipes, introducing water metering and water saving technologies, reforming water pricing, among others.
- MWI's Energy Efficiency and Renewable Energy Policy for the Jordanian Water Sector (2015, referenced in Jordan's first NDC), there is a target of 15 percent reduction in energy consumption vs 2019 levels of billed water by 2025, and to increase the share of the RE by 10 percent by 2025.
- Also, the 2025 National Vision and Strategy (referenced in the NDC) sets a target of 11 percent RE share in the total energy mix in 2025.

E. Rationale for Use of Instrument

21. **World Bank has engaged in the Water sector in Jordan since the 1990s.** The Jordan-Amman Water and Sanitation Management Project (P048521), which concluded in 2006, supported substantial improvements to efficiency, management, operation, and delivery of water and wastewater services for the Amman Service Area. The project pioneered private sector participation in the Jordanian water sector through a performance-based contract aimed at improving the overall efficiency of water supply and sanitation systems in Amman. The management contract successfully achieved 12 out of 15 water and sanitation measures focused on efficiency, network rehabilitation, and financial viability. As a result of the project, NRW was reduced from 54 percent in 1999 to 42 percent in 2006 including a pilot in 30 districts with continuous water where losses were reduced to an average of 23 percent.

22. **The World Bank provided support to the sector through the Second Programmatic Energy and Water DPL (P160236), which concluded in 2017.** The operation supported significant structural reforms for enhancing cost recovery

[36] Report No. 174677 discussed at the Board of Executive Directors on June 30, 2022

in the water sector through a combination of revenue increases and cost saving measures which resulted in a 37 percent increase in revenues of the three main utility companies and WAJ between 2014 and 2017 and an improvement in operating cost recovery ratio of 11 percent between 2015 and 2017. These gains were, however, short-lived as increases in global energy prices were passed to the water sector, increasing electricity costs by over 40 percent, and reducing cost-recovery to 73 percent. A need for further reforms, focused on viability of the municipal water and wastewater sectors, was recognized at completion review of the operation.

23. **The World Bank has continued analytical work (at regional and country level) and engagements with GOJ, IMF, and bilateral donors, especially throughout the development of the FSR to lay the foundations for this next phase of investments needed.** Country level analytical work supporting implementation of the updated Jordan Reform Matrix (2018 – 2024), supported through the Jordan Multi Donor Trust Fund, has convened development partners in the preparation of the Jordan Water Sector FSR. Both the FSR and the updated Reform Matrix are strongly linked with the Economic Modernization Vision 2033, as the Jordan Reform Matrix directly addresses many of the key sectors and initiatives that fall under the Vision, including a strong linkage to the FSR through the promotion of improved water efficiency, water quality, and identifying new water resources. The FSR was approved by cabinet in November 2022 and a similar Chapter in the draft National Water Sector Strategy parallels the FSR policy and investment recommendation. With this background of strong engagement with the Government and donor partners and convening role in preparing the Government program, the World Bank is well-placed to engage in critically needed next steps.

24. **The SOP builds on World Bank support in sectors with close ties to the water sector.** The SOP is synergistic with the Agriculture Resilience, Value Chain Development and Innovation (ARDI) Program (P167946; approved in September 2022) as it will by provide information useful in the agriculture sector through drought monitoring and water availability briefs, furthering strengthening agricultural resilience. Through EE investments the SOP will build on synergies with the Jordan Electricity Sector Reform and Resilience Program for Results (P171296). The SOP's emphasis on institutional strengthening for water sector efficiency is complementary to governance reform measures advanced in the Strengthening Reform Management in Jordan project (P171965), which is a Recipient-Executed Trust Fund.

25. **There are several ongoing budget support operations and various investment projects in the water sector in Jordan**. Supported by different donors, these projects provide much needed finance and technical knowledge which contribute to the Government program. European donors provide significant support for the water sector in Jordan and the United States Agency for International Development (USAID) provides significant support for NRW reduction activities in Jordan. However, a significant gap remains between budgetary support and on-the-ground WC performance because of the need for enhanced coordination and institutional support at different levels. Mobilizing efficiency investments through a long-term, phased approach will the provide investment continuity needed for major investment in infrastructure and institutional reform, linking planning with action, will benefit from flexibility in adapting design over time as circumstances evolve, and will improve financial planning as financing costs are better aligned with the need for finance.

26. **A SOP based on the IPF instrument is proposed** based on (i) the need for long-term support for efficiency investment and institutional strengthening; (ii) lack of recent World Bank water sector investment financing and limited familiarity of the MWI with World Bank procedures, which may limit the client's capacity for programmatic implementation and risk management; (iii) varying levels of readiness of the specific project-level investments in NRW reduction, prompting a pragmatic approach of advancing preparatory studies in earlier phases for infrastructure mobilization in later phases; (iv) the need for capacity building and public-private partnership (PPP) development to implement distributed works at scale; and (v) risks related to needed oversight of investment activities that can be better managed with an IPF. It will also allow for World Bank provided technical assistance (TA) support, adaptive learning and provide opportunities to accommodate an evolving political economy around ambitious sector reform.

II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

27. **The Project (SOP-1) Development Objective (PDO) is to improve the efficiency of water services in Jordan**. Improving efficiency of water services includes: (a) improvement of services to beneficiaries through rehabilitated water distribution networks; (b) improving EE; (c) improving the drought management system.

PDO Level Indicators

28. The following are the PDO level indicators:

- **PDO 1: Areas where foundations for NRW reduction are established (# DMAs)** – this is defined as the number of District Metered Area (DMA) established, hydraulically isolated, with baseline established, and rehabilitation designs completed (#) and rehabilitation works completed (#);
- **PDO 2: Beneficiaries with access to improved water services (number)** - this is defined as the number of beneficiaries from improved water services: quantity of water, hours of service, water quality and/or responsiveness to customer complaints;
- **PDO3: Electricity use reduced (kWh/y) –** Reduced electricity use from the grid through Project interventions (kWh/y reduced); and
- **PDO 4: Drought management system operationalized (# components)** – this indicator will capture operationalization of the Drought management system, through actions such as: (i) drought monitor uses additional indicators and is validated in a regular basis; (ii) seasonal forecasting information is generated on a bi-weekly and monthly basis; (iii) drought vulnerability assessments completed; and, (iv) drought preparedness and contingency plans approved by Technical/Ministerial Drought Committee.

B. Project Components

29. The proposed Project cost is $300 million, financed by a $200 million IBRD loan, and $50 million concessional financing from the GCFF and an anticipated joint, co-financing from AFD ($50 million equivalent in euro), for which Approval is anticipated in July 2023.[37] SOP-1 will be implemented over a 5-year period. SOP-1 will follow a framework approach, where categories of investment and criteria for investment support are described below and specific investments will be cleared through the Annual Work Planning process according to the framework criteria. Additional technical project description is included in Annex 3.

30. These components leverage Performance-Based Conditions (PBCs) for priority activities that require a focus on institutional reform and strengthening. Component 1, supporting NRW reduction, includes PBCs focused on systematic planning, monitoring and reporting of NRW, improved WC performance and financial management (FM) and improved customer relationship management. Component 3 includes PBCs which focuses on improved water allocation practices, drought management systems and improved risk assessments for surface water reservoirs.

31. Proposed interventions are grouped around five components:

[37] *The Global Concessional Financing Facility (GCFF) is a partnership that brings together bilateral donors, MDBs and the UN system to address the financing needs of middle-income countries hosting large numbers of refugees. By providing concessional resources to multilateral bank loans, the GCFF enables eligible middle-income countries that are facing refugee crises to borrow at below regular multilateral development bank rates for projects that provide a global public good. Jordan became an eligible benefitting country to the GCFF in 2016, enabling potential contributions to the proposed operation and others in the future. The* GCFF financing envelope reflects full concessionality]

32. **Component 1. Sustainable non-revenue water reduction ($209 million).** Efficiency will be improved by reducing loss of the available water resources (commercial and technical) and overall improvement in operational systems in the water sector. This component will focus on improving the efficiency of water supply services, through NRW reduction (commercial and technical) to improve water availability and revenues within the Project areas through (i) NRW reduction infrastructure investments; (ii) modernized systems for sustaining NRW reduction; and (iii) institutional strengthening for sustaining NRW reduction (implemented with support from PBCs)**.** Identification of sub-projects under this Component will follow a framework approach, where categories of investment and criteria for investment support will be agreed during preparation and specific investments will be cleared after the Capital Investment Master Plan is finalized. As one of the most water scarce countries in the world, , NRW reduction will have a unique opportunity to significantly enhance resilience in Jordan, especially when compared to the impact of NRW on countries with higher water availability. NRW reduction will support adaptation to climate change's detrimental impacts on water availability and increasing frequency of drought by reducing leakage and thereby increasing the volume of water that is delivered to the users and mitigation of climate change through reducing the energy requirement per unit of water delivered to the customer. NRW reduction will directly benefit refugees and their host communities by providing better and more consistent access to water, which would reduce their need to purchase bottled water and from tanker trucks and enhance their public health outcomes. There will be three sub-components:

33. **Sub-component 1.1. Improved service delivery and NRW reduction ($155 million):** This sub-component will consist of financing works and preparatory studies for reducing the NRW and sustaining the reduction in subsequent periods. Rehabilitation sub-projects that contribute to NRW reduction were identified for Amman, Balqa, Irbid, Jerash, Ajloun, Mafraq, Aqaba, Karak, and Tafileh governorates (Annex 3). This sub-component will also support preparation studies for sub-projects that could be supported in SOP-2. Following good practice, NRW reduction investment will entail restructuring the water network into hydraulically isolated DMAs, rehabilitation or replacement of the network, replacement of household connections, installation of customer and bulk meters, followed by regulating and maintaining pressure within the network within acceptable parameters. Once a DMA has undergone these steps and has improved the level of NRW, systematic leakage identification and repairs will be undertaken to maintain the NRW improvements. There may also be rehabilitation of replacement of the transmission pipelines based on identified leaks to reduce water losses as well as augmenting the storage capacity in the network that will aid the identification of leaks. Thus, enhancing NRW can help utilities enhance resilience to climate change by relieving, to a certain extent, the constant stress of finding sustainable sources of water. Specifically, this sub-component will support:

(a) *Rehabilitation activities* will entail network replacement and rehabilitation, household connection and meter rehabilitation or replacement, network zoning, installation of Supervisory Control and Data Acquisition (SCADA) system and Geographic Information System (GIS) and other technical actions needed to lay the foundation for NRW reduction at the level of the three water companies in Jordan. This sub-component will also finance the preparatory studies (feasibility, design, impact assessment, development of bidding documents) required for investments to be implemented by the three water companies.

(b) *Preparatory studies and activities* for sub-projects entailing rehabilitation works that will be implemented by the three WCs in the future, including through potential support of SOP-2, will also be supported by sub-component 1.1. This support will be similar to actions listed under 1.1(a), including feasibility, detailed design, impact assessment and preparation of bidding documents.

34. **The IFC provided upstream support for development of a PPP to support NRW reduction for a sizable portion of Amman (roughly one third of service area) and signed a co-development agreement with the GOJ to jointly develop the structure of the PPP**. The IFC is working with the GOJ to make financing available to the selected private partner. The World Bank will assess opportunities to complement this by financing the public sector's share of the capital investment and eligible incremental operating expenditure as part of SOP-2. This sub-component will support technical

and environmental and social assessment studies, as needed, in support of preparation of the PPP, where needs will be identified as PPP preparation advances.

35. **This sub-component will follow a framework approach with criteria for sub-project selection, given that the Capital Investment Master Plan, the guiding document for infrastructure investment prioritization, is not yet completed.** Pre-identified rehabilitation and foundational efforts for NRW reduction are shown in Annex 3 and this list of investment actions will be narrowed during implementation through the Annual Work Planning according to framework criteria (see Annex 3 for criteria). Criteria for sub-project selection includes refugee and host community targeting to ensure that project support improves water services in the areas most impacted by refugee influx. The Capital Investment Master Plan is under development now, including detailed hydraulic modeling, where the inception report was received in December 2022 and final Master Plan is expected in July 2023.

36. **Sub-component 1.2. Modernized systems for sustaining NRW reduction ($48 million).** This sub-component will strengthen NRW reduction systems in the country to improve planning, operationalization, and help sustain NRW reduction over time. It will specifically support: (i) the operational capacity of the central NRW unit as it regularly provides advisory and oversight on NRW levels in all governorates; and (ii) the institutional capacity strengthening and NRW reduction activities of the Water Companies. Efforts necessary to strengthen the Water Companies' ability to deliver on and sustain NRW reduction will be determined through application of the Utility of the Future Framework, a diagnostic tool that holistically assesses opportunities for utility performance improvement in a 100-day Action Plan and a 5-Year Action Plan.[38] Following application of the diagnostic tool, sub-component 1.2 will support practical measures identified in the Action Plans that will improve the Companies' corporate delivery mechanisms (including operational, managerial, and financial status) using new strategic management approach of water companies' transformation to achieve operational efficiency. Practical institutional strengthening measures are likely to include: (a) planning updates for achieving NRW goals; (b) strengthening operational management and tools (e.g., assets management, O&M planning and implementation, improvement of business processes such as accounting, procurement, project management, risk management and compliance and supply-chain operations); (c) provision of equipment, goods and services needed to monitor NRW in water systems, including digitalization of relevant systems, implementation of GIS, SCADA, and other technologies used to monitor NRW; (d) strengthening the customer relations management systems; and (d) training on operational and technical systems for NRW reduction.

37. **This sub-component will leverage PBCs to improve the results focus of selected institutional performance improvement measures needed to sustain NRW reduction.** The PBCs will increase the focus on systematic planning, monitoring and reporting of NRW (PBC 1) and improved WC performance and financial management (PBC 2) as a complement to infrastructure investments in Sub-component 1.1. Systematic planning, monitoring and reporting of NRW will be mobilized through increasing the focus on technical rigor, geographic granularity and information services using digital systems for NRW monitoring and reporting, to institutionalize and regularize monitoring and reporting of NRW levels across the nation. It will also support strengthened systems for WC performance by mobilizing robust participation in diagnostic planning that leverages the World Bank's Utility of the Future (UofF) program and enhancing results targeting related to achieving objectives outlined in the UofF plans, including actions on digitalization of relevant systems, improving billing-collections ratio and improvement of customer relationship management through better use of stakeholder engagement tools in order to maintain NRW reductions achieved. One of the systemic challenges in sustaining NRW reduction has been the lack of dedicated resources to undertake systematic leakage identification and

[38] The World Bank has developed Utility of the Future (UoF), a program designed to ignite, materialize and maintain transformation efforts in WSS utilities. The goal is to become the Utility of the Future —a future-focused utility, which provides reliable, safe, inclusive, transparent, and responsive WSS services through best-fit practices that allow it to operate in an efficient, resilient, innovative and sustainable manner.

reduction activities. This sub-component will address this by incentivizing the establishment of an NRW reduction fund at WAJ level.

38. **Institutionalizing and sustaining reforms requires improved systems and processes as well as staff that are trained and equipped with tools and resources**. Support mobilized under this sub-component will support goods and services related to strengthening institutional performance and will also support incremental operational expenditures to cover a portion of additional operational expenditures necessary for meeting the performance objectives (detailed in Annex 7, Table 1).

PBC/Sub-PBC	Allocation
PBC 1. Modernized and systematized NRW planning and monitoring	**$5m**
PBC 2. Improve WC performance and financial management	**$21.4m**
PBC 2.1 WC performance improved	$18.4m
PBC 2.2 NRW Reduction fund established and capitalized to support sustainability of NRW improvement	$3m

39. **Sub-component 1.3. Community engagement to improve financial sustainability, collections efficiency, and demand control ($6 million).** This sub-component will support tools to strengthen WAJ and the companies' mechanisms to engage customers and stakeholders to improve operational efficiency and financial sustainability. This will include institutional measures needed for community engagement and education on the need for advanced water efficiency such as: (i) stakeholder surveys, strategic studies, social assessments, detailed willingness to pay surveys, communications and outreach efforts around water scarcity and subsidy reduction; (ii) support for specific community trainings and outreach to curb demand at the customer level. This component will leverage PBCs to support a results focus on increased community engagement actions, incentivizing institutionalization of stakeholder engagement and community outreach for improved service delivery and customer relationship management. This sub-component will support goods and services related to institutionalization of stakeholder engagement as well as incremental operational expenditures to cover a portion of additional operational expenditures necessary for meeting the performance objectives (detailed in the Annex 7, Table 1).

PBC/Sub-PBC	Allocation
PBC 3. Institutionalization of stakeholder engagement and community outreach	**$3.6m**

40. SOP-1 will support the activities to increase participation of women in the water sector, help with the necessary plumbing skills acquisition, certifications as plumbers and support their access to employment opportunities in their communities. It will do so by partnering with the two entities: (i) Women Plumber Initiative (WPI) which provides vocational training, equipment, and acquisition of a plumber certification to women allowing them to provide plumbing services and raise awareness about water scarcity in their communities; and (ii) the Wise Women Association and Cooperative (WWAC) housed under MWI which maintains a roster of certified female plumbers and deploys them for plumbing services.[39] The project will engage WPI to provide vocational plumbing training and equipment for women, aiming in particular to benefit vulnerable women such as refugees, low-income households, divorced, widows, single

[39] Certified women will become members of WWAC roster and will have the following options based on their preference: (i) self-employment whereby WWAC will promote the services of certified women through social media based on their location which will facilitate matching female plumbers with female clients at the household levels; (ii) participating in income generating opportunities when MWI implements actions that involve leakage reduction or maintenance activities.

mothers, disabled or with special needs, and will strengthen WWAC's ability to support income generating opportunities with activities such as enhancing curriculum on soft skills, providing advisory services to certified women on entrepreneurship, and support the community of practice for stronger advocacy of women in the sector. These activities will help vulnerable women increase income generating opportunities in the water sector and overcome cultural barriers to working outside the home. This activity will also contribute to demand management and reduction of physical losses at the household level by encouraging women to reduce household water consumption by increasing their awareness about and participation in water demand control efforts. The project will also aim to improve the selection of women in consulting and contracting related to the project, working with the client to increase preferential procurement of firms that include women.

41. **Component 2. Increased energy efficiency and reduced energy supply costs ($54 million).** The water sector in Jordan requires significant energy for its operation: energy costs represent almost half of the water utilities' operational costs, due to pumping costs associated with extraction of deep groundwater, conveyance of water from the source to populations centers. EE improvements in the water sector are a national priority for more sustainable management of the water sector in Jordan and will have a direct impact on the financial sustainability of the water sector by reducing operational costs. This component will improve efficiency of the water sector by reducing energy used, costs and GHG emissions by improving EE of existing water systems through pump and water equipment rehabilitation/replacement and installation of RE systems. Energy efficiency improvement under this component will help enhance resilience by reducing operational costs, enabling climate adaptation by freeing up budget for system maintenance, reducing leakage, which is particularly important for resilience in Jordan due to the extreme water climate-change exacerbated water scarcity . This component will also contribute to climate mitigation through deployment of low-energy consumption technologies, promotion of better auditing practices, increased use of RE and reducing the need to increase electricity generation requirements for the water sector through shifting the peak-energy load to off-peak demand hours.

42. Actions are not geographically restricted but will be implemented according to GOJ prioritization criteria, including cost-benefit analysis and alignment of implementation timeline with capital works improvement efforts. This activity will build on the TA and investment support provided by Germany's Gesellschaft für Internationale Zusammenarbeit (GIZ) and other partners and will support investments in EE, through replacing pumps and other electromechanical equipment with more energy efficient devices, including RE.

43. **Sub-component 2.1. Improving energy efficiency in the existing water systems ($54 million).** This sub-component will support actions that reduce energy use in the water sector, including the bulk water conveyance systems, the urban water distribution systems and other water infrastructure that has significant energy requirements. This support contributes to climate mitigation by mobilizing a substantial increase in EE. Actions supported will advance implementation of EE measures identified in the Energy Efficiency and Renewable Energy Policy and Action Plan (2020 to 2030) through: (i) a feasibility, design and supervision consultancies; (ii) works contracts to implement the designed actions; and (iii) an energy audit to identify additional EE actions needed in the water sector, including within JVA's systems, that go beyond the current Action Plan and may be implemented in Project 2 of the SOP. The audit would be based on the to-be-developed water distribution system-level hydraulic model.[40]

44. **This sub-component will include investments in RE to reduce sector energy costs.** Assessment of these actions will be subject to a feasibility analysis, confirmation that the RE investment is in a location where there is not excess energy in the grid and subject to agreement between the water and energy sectors.

45. **This sub-component will support preparation studies for infrastructure that will improve management of energy in the water sector to reduce energy use and costs of the water sector and mitigate climate change.** Building

[40] USAID and GIZ are completing distribution system-level hydraulic models to support decision making in the water sector. Both models are anticipated in 2022 and will inform distribution of bulk water between governates and thus energy pumping requirements.

on the peak load shifting roadmap under development by GIZ, it will support detailed studies to establish designs for specific investments that enable reduction in peak energy demand.

46. **Component 3. Water security measures to underpin efficiency improvements ($27 million).** This sub-component will support mechanisms to enable efficient and fair management of water resources, providing tools to adapt to the impacts of climate change. Tools that underpin allocation of water based on an informed assessment of water availability and water demand are needed. In particular, monitoring and forecasting under drought conditions, as water becomes increasingly scarce and droughts are increasing in frequency, are necessary to ensure that practical solutions and long-term strategies for water security respond to changing conditions and climate change risks, improving beneficial use. Safe and sustainable dam and reservoir functioning enables reliable water storage, which is essential for the provision of bulk water to municipal and irrigation service providers. The protection of water storage systems from rapid sedimentation, which is increasingly reducing the storage capacity and safety of these systems, is also an important climate adaptation measure for ensuring water security.

47. **Drought management will directly benefit refugees and their host communities as it will help improve information regarding water availability, improving water-users' ability to respond and recover from reductions in water supply**. As such, it has the potential to reduce the impacts of drought shocks on the climate-sensitive agricultural sector, refugees and their host communities employment.

48. This component will strengthen water allocation planning, develop drought management systems, and investments to safeguard existing water storage systems. Activities are divided into two sub-components that will leverage PBCs to improve results focus of selected institutional performance measures that are needed to incentivize adoption of improved water allocation planning and other water security measures under the SOP.

49. **Sub-component 3.1. Strengthening drought management and water allocation systems ($9 million).** This sub-component aims to regularize informed water allocation planning and to apply a comprehensive drought risk management approach to increase capacity to monitor, forecast, plan for, and respond to droughts in the water sector. These actions contribute significantly to climate adaptation as changes in water availability and shortages in water supply are expected to worsen with increased intensity and frequency of drought events in Jordan under future climate.

50. **This sub-component will support the development of a drought management system.** This will be achieved through: (i) the operationalization of a drought monitoring system for the regular and periodic monitoring of drought conditions, including seasonal forecast information to inform decision-making, (ii) the preparation of vulnerability assessments to identify most affected groups or sectors to different levels of drought intensity; and (ii) the preparation of preparedness and contingency plans that will outline drought mitigation and response actions for at least two pilot systems, including irrigation, in areas based on assessed vulnerabilities and on the different levels of drought intensity. Improvements to information management systems will also be required to enable data collection, processing, and other information decision-support functions of the drought monitoring and forecasting system, for which SOP-1 will support: (i) the preparation and adoption of data-sharing protocols; (ii) improvements to existing water information platforms to enable water sector data and information interoperability and exchange, analysis (tools and models for operational use in water sources planning), visualization, and decision-support functionality (e.g., generation of bulletins, reports, SMSs, data user applications, and a decision-support dashboard). SOP-1 will also support the elaboration of an information systems operation and maintenance plan and a capacity development program for to relevant staff to support the sustained operation of developed systems.

51. **Refugees and their host communities identified by the vulnerability assessments will benefit through improved information and decision making in the agricultural sector in response to droughts.** Improved monitoring, forecasting, and planning will positively impact refugees and their host communities working in the agriculture sector. The drought management system will provide advanced notice to farmers as to irrigation water availability and allocations, allowing

farmers to improve their planning of seasonal employment opportunities, thus informing refugees of potential need to seek employment in other sectors.

52. **This sub-component will support improvement of water allocation plans.** The intersectoral water allocation plans will be developed based on an annual water balance and on improved water resources information systems and will inform allocation among major sectors (municipal supply, irrigated agriculture, industry) as well as refugee camps (where receipt of bulk water allocation is the primary water-supply challenge). Institutionalization of water allocation planning requires goods, services, and an incremental role for MWI staff, to improve systems for gathering, sharing, and processing data on the annual distribution of water supply and demand among the water demand centers.

53. **This sub-component will also use PBCs to incentivize institutional actions necessary to improve water allocation and drought contingency planning, including citizen engagement.** The PBCs will be used to increase the focus on institutional arrangements for improving water allocation planning and drought management, including citizen engagement and participatory planning during drought contingency planning. The water allocation plan will be prepared based on an annual water balance utilizing information management systems for the integration, analysis, and reporting of estimates, and incentivize incorporation of stakeholder responses into drought contingency plans by soliciting and incorporating feedback on aspects of the plans and envisaged response measures. Support mobilized under this sub-component will include goods and services related to strengthening institutional performance for water allocation and drought contingency planning and will also support incremental operational expenditures to cover a portion of additional operational expenditures necessary for meeting the performance objectives (detailed in Annex 7, Table 1).

PBC/Sub-PBC	Allocation
PBC 4. Water allocation systems modernized, strengthening annual water allocation planning and incorporating drought contingency planning	**$3m**

54. **Sub-component 3.2. Safeguarding existing water storage ($18 million).** This sub-component aims to safeguard the existing storage and enhance water security. This will be achieved by supporting the development of tools to assess the safety of dams and climate related risks, advancing rehabilitation of water storage systems that regulate and maintain the safe provision of bulk water for municipal supply and irrigation. These actions contribute significantly to climate adaptation as water storage is the primary tool Jordan uses to increase water security and manage the risks associated with the increasing frequency of drought, while enabling more efficient utilization of TWW, a water source that is used to supplement declining availability of freshwater due to climate change. This sub-component will identify, prioritize, and advance preparation of investments through: (i) strengthen the national inventory and database of the country's dams; (ii) development and application of a risk and resilience indexing tool to identify and prioritize rehabilitation needs; (iii) detailed designs and supporting environmental and social assessments for priority rehabilitation projects; (iv) development and implementation of sediment management plans for prioritized dams; (v) investments in priority, no regret investments in improving the safety of dams; (vi) equipment and instrumentation to improve operations, forecasting capabilities and emergency preparedness; and (vii) TA to strengthen the capacity for dam safety.

55. **This sub-component will leverage PBCs to improve the identification and prioritization of measures needed to safeguard existing surface water storage.** The PBCs will focus on operationalizing an indexing tool that will characterize dam safety risks in a systematic, qualitative, and relative manner to help evaluate and prioritize safety issues for individual dams and the portfolio of dams in Jordan. Operationalisation of the risk indexing tool will identify and prioritize dam safety measures and remedial actions, identify knowledge gaps (for example, dam records, hydrological data, instrumentation adequacy, among others) and evaluate the effects of risk reduction and dam safety enhancement measures on the overall risk profile. Support mobilized under this sub-component will support goods and services

related to dam safety and water security and will also support incremental operational expenditures to cover a portion of additional operational expenditures necessary for meeting the performance objectives (detailed in Annex 7, Table 1).

PBC/Sub-PBC	Allocation
PBC 5. Safeguarding surface water storage: Dams Risk Indexing Tool Developed, Adopted and Operationalized	**$6m**

56. **Component 4. Project management and implementation support ($10 million).** This Component will focus on project management required to implement this Project and to strengthen systems for the planned SOP.

57. **Sub-component 4.1. Project management and implementation support ($8 million).** This sub-component will support overall project management and implementation of SOP-1 through enhancing capacity of: (i) the Project Management Unit (PMU) within WAJ; (ii) the implementing entities, including the MWI, the JVA and the water companies; and (iii) training and capacity building.

58. **Sub-component 4.2 PBC Verification and audit support ($2 million).** This sub-component will provide TA support to review and verify results associated with PBCs. It will also support the external audit required for project fiduciary oversight.

59. **Component 5. Contingency Emergency Response ($0 million)**. A Contingency Emergency Response Component (CERC) with zero allocation will be created and made implementation-ready to allow the GOJ to respond quickly in case of an eligible emergency. The mechanism will be defined in a specific CERC Operational Manual that will clearly outline the triggers, eligible expenditures, procurement thresholds, and procedures for using part of IBRD resources of the project to respond quickly in the event of an eligible emergency. AFD will not finance the CERC.

C. Project Beneficiaries

60. Direct project beneficiaries include: (i) 1,600,000 residents served by the three WCs (of which 80,000 refugees) will directly benefit from the reduction in water losses and improvements in system efficiency through improved water reliability and availability;(ii) approximately 10,000,000 residents served by the three WCs will indirectly benefit from EE and reduced supply costs; (iii) farmers, agribusinesses, and their employees (including refugees) will directly benefit from improved water allocation planning and capacity to prepare and respond to varying water availability and drought risks reducing potential drought impacts, (iv) citizens and farmers through active engagement and consultation for development of drought vulnerability maps and by convening citizens groups to inform development of drought contingency plans, (v) women receiving training and equipment (through WPI and becoming part of WWAC, increasing their employment opportunities in the water sector), and; (vi) the three water companies in Jordan, and WAJ will directly benefit through training and capacity building elements of SOP-1.

61. Supporting refugees by improving the quality of their access to water service is central to the program, including targeting refugees directly with interventions (water service improvement and income generating opportunities) and mainstreaming their inclusion across interventions to maximize indirect benefits (resilience, employment opportunities):

- Sub-component 1.1: Refugees and their host communities will directly benefit through needed investments aimed at improving the water supply services providing better and more consistent access to water which will reduce the need to purchase bottled water and from tanker trucks. Improving efficiency in the water sector will reduce debt accumulation thereby allowing the water sector to make future investments to augment water supply, and maintain the increased levels of service continuity, indirectly benefitting refugees and their host communities.

- Sub-component 1.3: This sub-component will increase participation of women including refugees in the water sector, help with the necessary plumbing skills acquisition and support their access to employment opportunities in their communities. Women will directly benefit from increased opportunities for employment in the water sector and overcome cultural barriers to receiving plumbing services. This activity will also aim to improve the selection of women in consulting and contracting related to the project, working with the client to increase preferential procurement of firms that include women.

- Sub-component 2.1: Improving EE in the water sector will reduce debt accumulation by lowering operational costs thereby allowing the water sector to achieve operational cost recovery. The reduced financial strain and debt accumulation will allow the water sector to make future investments to augment water supply, indirectly benefitting refugees and their host communities.

- Sub-component 3.1: Water allocation planning will directly benefit refugees in camps as the camps will be included as water demand centers in the water allocation planning process. Drought management will indirectly benefit refugees as it will help improve information regarding water availability, including the ability to respond and recover quickly from reductions in water supply. As such, drought management has the potential to reduce the impacts of drought shocks on the agricultural sector and refugee employment.

Specific Contribution of the SOP to helping Jordan achieve its NDC

62. In addition to supporting the government program focused on water sector, this SOP also contributes directly to achievement of Jordan's NDC. Jordan has demonstrated strong commitment to climate action and views the World Bank as a strategic partner in advancing the climate agenda in the country. In 2021, Jordan submitted its revised NDC, increasing its commitment and raising its conditional greenhouse gas emissions reduction target to 31 percent by 2030. This Project will support the NDC priorities, as well as climate adaptation and low carbon prioritization plans, including the first climate change adaptation plan that puts emphasis on agriculture, the NWS, the National Strategy for Agricultural Development, and the National Energy Sector Strategy. Jordan's NDCs highlight priority water-related adaptation measures such as maximizing TWW re-use in agriculture, EE measures in the water sector, including replacement and rehabilitation of pumping stations and water sector equipment (Component 2), reducing water losses in distribution pipes (Component 1), introducing water metering and water saving technologies (Component 1), among others.[41]

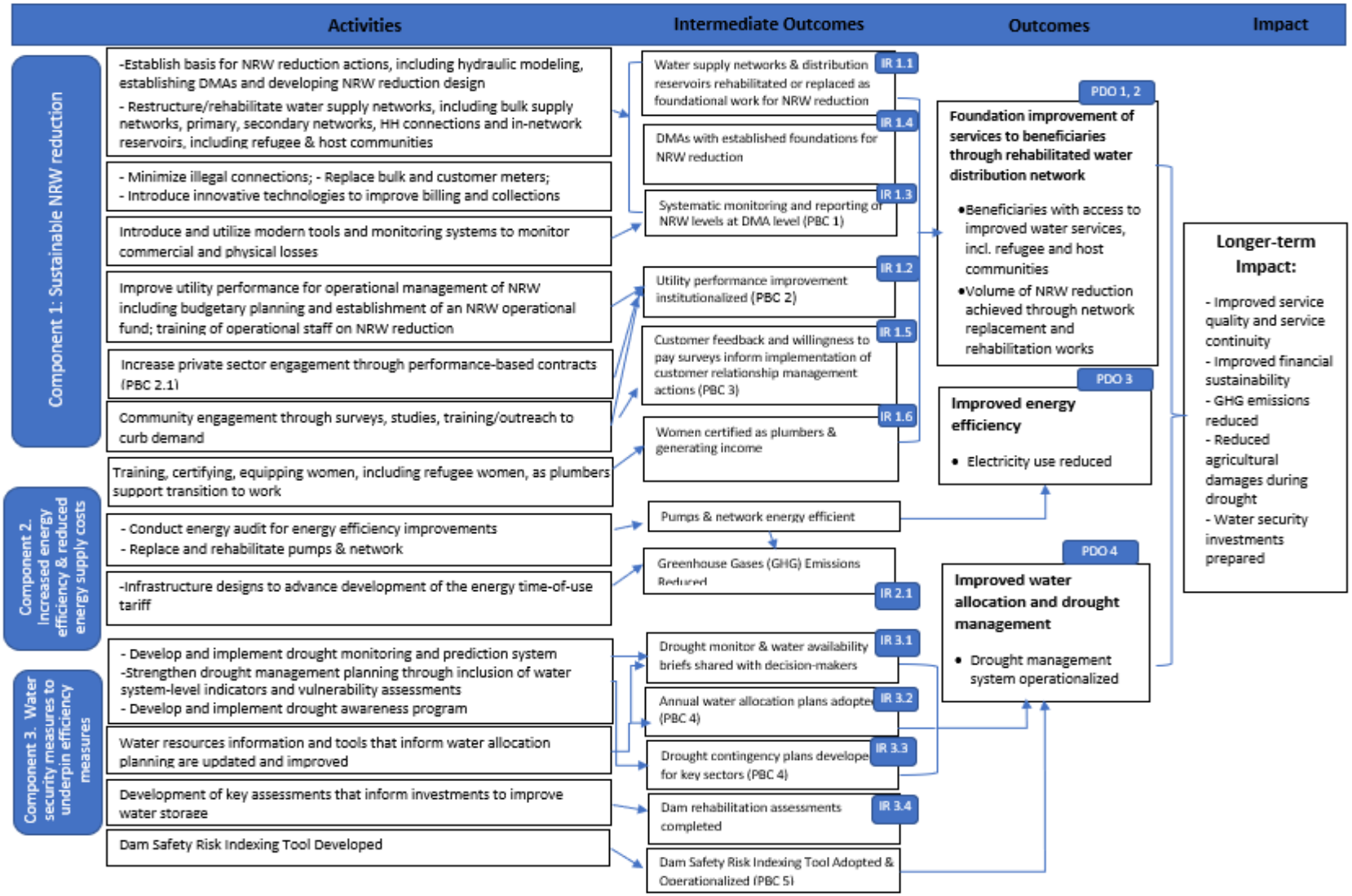
D. Theory of Change

63. The Theory of Change for SOP-1 is based on a combination of generating efficiency gains that will improve services and corresponding efficiency improvements in water allocation and drought management systems that will improve bulk water systems and decision making that underpin water services. The efficiency gains are generated through (a) reducing and sustainably managing water losses; (b) improving EE; c) improving efficiency of water allocation among sectors and within the irrigated agriculture sub-sector (reflected as PDO indicators, 1-4, below). The impact of these results is anticipated to be improved service quality and service continuity, improved financial sustainability of the sector, adaptation to climate change, reduced GHG emissions and reduced agricultural damages during drought. PBCs will be used to incentivize institutionalization of reform measures needed for sustainability of efficiency gains (as noted in the Theory of Change). Constraints to generating efficiency gains include weak institutional incentives to translate high-level targets into results (of utilities and their staff), and a lack of a systematic mechanism for targeting both capital

[41] Hashemite Kingdom of Jordan Intended Nationally Determined Contribution (INDC)
https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Jordan%20First/Jordan%20INDCs%20Final.pdf

and maintenance funding to the areas of greatest need and inefficiency. The activities that SOP-1 intends to support, their contribution to intermediate and long-term outcomes, and impacts are summarized in Figure 1.

Figure 1. Theory of Change for SOP-1 showing the contribution of Activities to Intermediate Outcomes, Outcomes, and Impacts.



E. Rationale for World Bank Involvement and Role of Partners

64. **The World Bank is uniquely positioned to help the GOJ improve the efficiency of existing water supply systems.** The FSR is a policy roadmap that is linked to the IMF's EFF, the NWS, and the Government's Reform Matrix introduce efficiency investments as a key pillar in restoring financial sustainability in the water sector through infrastructure investments and through institutional support. Infrastructure interventions to reduce NRW will require continuous investment over the next 15 years to meet the target of reducing NRW from 53 to 25 percent by 2040. Establishing and sustaining NRW reduction will require institutional level innovative water-energy policy advances, innovative tools in the water allocation and drought management, and private sector mobilization. The World Bank can also use its convening and coordinating power to catalyze international support for investments projects, analytical work, and advisory activities. World Bank safeguard policies will ensure that social and environmental considerations are properly addressed before, during, and after implementation of the SOP.

65. **Role of development partners.** A number of development partners (USAID, AFD, GIZ, Kreditanstalt für Wiederaufbau (KfW), JICA) support efforts to improve efficiency in the water sector, using varying implementation modalities and financing mechanisms. USAID is leading a water governance initiative which, among other contributions, supported revision of the Water Sector National Strategy and the NRW Strategy as well as reviewing overall institutional arrangements for the sector. USAID also funds a series of projects focused on NRW reduction in various governorates, implemented through reimbursable services agreements. AFD is a very active partner in the water sector in Jordan, supporting a range of efforts including institutional reform and financial sustainability, infrastructure investment across the sector and water, sanitation and hygiene actions in rural areas and is planning co-financing support for SOP-1. German development cooperation is active in Jordan, with KfW focusing on a variety of infrastructure projects in the sector, including some EE and water supply network rehabilitation works and GIZ providing significant TA on NRW reduction (particularly commercial loss reduction) and the water-energy nexus, particularly planning, identification and feasibility studies for EE, RE and peak-load shifting. The European Investment Bank (EIB) is also an active partner in the water sector, with a framework loan in place for the sector as well as support for canal rehabilitation to improve efficiency in the sector. The World Bank has a collaborative dialogue with the core partners in the sector, through bilateral exchanges and participation in the core donor working group meetings, and will continue to work with partners to build on lessons learned and avoid duplication during preparation and implementation. The Core-Donor Group, comprised of these key donors, meets regularly on water sector issues and will set up a committee to review and coordinate on NRW investments to avoid duplication of effort.

F. Lessons Learned and Reflected in the Project Design

66. **A review of implementation capacities showed that implementing agencies have significant experience implementing similar projects on water efficiency including NRW reduction, increasing EE and drought management**. The development partners active in the sector support efforts with a similar goal of improving efficiency in the water sector, although the development partners use varying implementation modalities and financing mechanisms. Implementation capacities were examined based on an analysis of past performance, bibliographic sources, interviews with actors directly involved, field visits, and interactions with development partners active in the sub-sectors covered by SOP-1. Implementation capacity challenges for SOP-1 are: (i) scaling up overall implementation in the sector given the current overall capacity and staffing in the sector; (ii) monitoring and coordination across the multiple lines of support for similar activities; and (iii) refining implementation modalities to improve engagement of the water companies and the private sector to maximize results and overcome capacity challenges.

67. **Capacity to scale up implementation of capital works investment is limited in Jordan.** Building on experience of other development partners supporting the sector, the SOP will strengthen implementation and project planning and monitoring capacity at all levels, financing the NRW monitoring unit within MWI, the PMU in WAJ and project

implementation units (PIUs) in each water company (WC). SOP-1 will support targeted training and capacity building for the implementing agencies, with a particular focus on private sector engagement through performance-based contracting.

68. **Planning, prioritizing, and monitoring NRW actions is a challenge in Jordan given the vast investment needs and limited baseline data availability.** USAID is supporting installation of bulk meters and SCADA systems throughout Jordan, which will bolster the government's ability to quantify commercial and physical losses. WAJ and the Water Companies are updating the Capital Investment Master Plans at the national level and at the municipality level, with the support of GIZ and USAID, to inform on the priorities needs at the level of the governorates, including detailed costing, and technologies. This Project will benefit from the updated master plan to prepare the feasibility studies taking into consideration the needs at the primary, secondary and tertiary distribution system. The Master Plan will identify the best contracting approach with the participation of the private sector. Finally, the central NRW Unit is responsible for planning and monitoring implementation of NRW sub-projects, consolidating results and needed investments, allowing the government to improve its planning and oversight on water losses and their financial implications.

69. **Lessons learned on mobilizing the private sector and balancing implementation at WAJ and the WCs will be incorporated into SOP-1 design to overcome implementation capacity challenges.** There are concerns with the current water infrastructure delivery model, which primarily uses the centralized model of decision-making and implementation for infrastructure investment. SOP-1 aims to provide the incentives and tools to all the key stakeholders – MWI, WAJ, WCs and JVA – to revise the water efficiency model and align investment planning and execution with operations and maintenance, and to reduce costs and deliver improved services. Thus, reducing NRW will generate more revenue for water utilities as a result of accurate metering, billing, and revenue collection and O&M costs will be reduced.

70. **Global experience in NRW reduction.** NRW reduction projects have been implemented in several developing countries such as Armenia, Malaysia, Thailand, Vietnam and across multiple cities in India and Brazil. Performance-based contracts are the most common contractual model for engaging the private sector across geographies with the capital investments being publicly financed. Setting ex-ante specific targets for reduction of NRW is extremely challenging in a situation with limited hours of water supply due to (i) absence of a clear baseline figures for NRW; (ii) areas with constrained demand situation, like Jordan, may witness increase in NRW as supply increases to fulfill the unmet demand; (iii) using percentage of NRW as a metric is not appropriate for small geographic areas as the NRW figures can be manipulated by varying the volume of supply; (iv) need for greater volume of water when the DMAs are constructed to achieve full saturation of the network for measuring NRW and this will increase the NRW when the DMAs are being set-up; (v) the supply pressure can be modified to increase or decrease the NRW. Most performance based contracts allow the operator to set a target for each DMA once full hydraulic isolation is achieved and can be maintained. It is anticipated that as more areas move towards continuous supply, there will be greater consistency in the service delivery parameters (quantity, timing, and pressure) which will enable more consistent measurement, monitoring and control of NRW. In addition, global lessons demonstrate that in order for NRW reduction programs to be successful, utilities need to mobilize a change management program that integrates NRW reduction objectives at all levels and across the utility structure.

G. Citizen Engagement

71. Citizen engagement has been mainstreamed in SOP-1 design to improve the results of the Project, strengthen public service delivery, and empower citizens in livelihood relevant decision making. SOP-1 will support active citizen engagement in the development of drought management systems through active engagement and consultation for development of drought vulnerability assessments and by convening citizens groups to inform the development of drought contingency plans which will be shared back with the relevant communities (PBC 4). It will include customer feedback, service continuity and willingness and ability to pay surveys using them to inform the implementation of

customer relationship management actions throughout project implementation (PBC 3). SOP-1 will also engage with women, including refugee and disabled women, under such gender-sensitive interventions as WPI and WWAC, thereby attracting more women into the water sector employment and empowering them to reduce household water consumption in their communities. Finally, SOP-1 will have a grievance redress mechanism to allow citizens to provide feedback on project-related activities and to ensure that any grievances arising from the Project are properly documented and addressed.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

72. **The implementation arrangements are aligned with the current institutional architecture of the water sector in Jordan.** MWI is responsible for the overall monitoring of the water sector, water supply and wastewater systems and related projects, planning and management, formulation of national water strategies and policies, research and development, information systems and procurement of financial resources. Its role also includes the provision of centralized, standardized, and consolidated water-related data. The JVA is primarily focused on managing the water resources within the Jordan Valley, which encompass the dams to manage river flows and seasonal runoff, bulk irrigation water, distribution and drainage systems, the King Abdullah Canal and development of irrigation lands. The WAJ is a semi-autonomous government entity with responsibility for water and wastewater management, including investment, ownership, and management of bulk water development, water treatment, water utility services, sewer systems, and wastewater collection and treatment. While WAJ retains ownership of the majority of water and wastewater infrastructure, services have been assigned to the three regional water companies: MWC for the central areas, including greater Amman; (ii) YWC in the north; and (iii) AWC in the south.

73. **An Oversight and Coordination Committee will be established within three months of effectiveness to oversee and provide strategic guidance to implementation.** The Oversight and Coordination Committee will be chaired by the Minister of MOPIC and include senior management from MWI, WAJ, JVA, MWC, AWC, and YWC, with representatives from Ministry of Planning and International Cooperation, the Ministry of Finance, the Ministry of Agriculture, and the Ministry of Energy and Mineral Resources participating. The Oversight and Coordination Committee will meet at least annually and will be responsible for overall strategic guidance and oversight, as well as resolving inter-ministerial and inter-agency issues related to SOP-1. In parallel on an operational level, a Steering Committee will be established, chaired by Minister of MWI, and will meet at least quarterly and be responsible for: (i) implementation agency coordination and guidance; (ii) approving the annual work plans of the implementing entities; (iii) resolving any impediments to implementation that are within the control of the water sector; (iv) overseeing implementation progress; and (vi) ensuring good governance and accountability of the project implementing entities. The Steering Committee will be supported by the Central NRW Unit, which was established by MWI to plan and monitor the reduction of NRW nationally, specifically on: (i) the prioritization of NRW sub-projects; (ii) the performance of NRW reduction sub-projects; and (iii) monitoring and evaluation (M&E).

74. **The central NRW Unit enhance accountability and performance of the NRW sub-projects (sub-component 1.1) by closely monitoring NRW reduction activities.** The NRW Unit will, with WAJ PMU and the WCs, ensure that key performance indicators (KPI) are incorporated into bidding documents, and will perform regular implementation progress review and results monitoring on NRW sub-projects for all WCs. It will provide requested information to the Steering Committee to support decision-making and will provide an independent report to the Steering Committee on companies' performance on NRW reduction. The central NRW Unit will also provide support and technical advice to the water companies, as needed, for the efficient implementation of the NRW activities.

75. **WAJ will be responsible for overall coordination with support from the PMU.** The PMU was established to manage large infrastructure projects, including projects implemented with support from development partners. Within this context, WAJ will hold the designated account and be responsible for overall project management through the PMU, which will be responsible for: (i) preparing and consolidating annual work plans; (ii) monitoring implementation progress; (iii) monitoring compliance with environmental and social standards; (iv) collating implementation and results reporting; (v) developing procurement documents; (vi) compiling information from all the implementing agencies (i.e. Water companies, WAJ, MWI and JVA)and submitting regular project reports to the World Bank; and, (vii) supporting the Secretariat functions of the Steering Committee. The PMU is headed by a Director, who is accountable to the Secretary General of WAJ and the Office of the Minister, and includes a core staff of professionals with the necessary expertise and experience to undertake the PMU's mandate.[42] Additional Technical Assistance will be supported through the project to strengthen capacity, including core staff (NRW, Energy Efficiency, Monitoring & Evaluation (M&E), Environmental, Social specialists) and on-call expertise to respond to specific needs during implementation. WAJ will also hold a contract for a verification support consultancy (Independent Verification Agency (IVA)), which will provide a technical assessment on achievement of PBCs to inform the verification of results achieved under the PBCs. Verification will be based on a letter certifying achievement of results from the Minister of Water and Irrigation, documentation provided by the IVA and requisite documentation demonstrating achievement as prescribed in the verification procedures. FM and procurement will be handled by WAJ and WC Staff. In addition to the overall coordination, WAJ will be responsible for implementing actions related to bulk water systems, and providing strategic guidance on NRW and EE actions implemented by the Water Companies, along with any additional activities under component 1 and 2 not implemented by the Water Companies. These will be agreed during the annual work planning process.

76. **An Environmental and Social Standards Directorate (ESSD) is tasked with environmental, social, health and safety management, with qualified staff and resources** including current staffing consisting of one Head of ESSD, and Head of the Environmental and Social Impact Assessment Section. For this project, the ESSD will support the PMU by taking responsibility for the overall management of environmental and social risks and impacts (including health and safety) for the project, including oversight of activities undertaken by all implementing agencies. ESSD staffing will be supplmented by one Environmental Health and Safety Specialist, and one Social Specialist dedicated to SOP-1 implementation, supported by the Project with Terms of Refernce acceptable to the World Bank. Additionally, each WC PIU will assign qualified environmental and social focal point(s), with knowledge of the national environmental laws and regulations, and experience managing environmental, health and safety and social risks. Additional environmental and social expertise will be provided to the project through Technical Assistance aiming to strengthen the implementing agencies' capacity, and to respond to specific needs during implementation.

77. **The water companies (MWC, AWC, and YWC) will be responsible for implementation of activities under Components 1 and 2.** Each WC will be responsible for implementing NRW reduction actions in the secondary and tertiary networks, and activities that improve EE. Each company will establish a PIU that will be responsible for implementation. The responsibilities of the PIUs will include: (i) procurement and management of feasibility studies, detailed designs, works contracts; (ii) collecting data, M&E of project activities; (iii) FM and reporting on the project account; and (iv) reporting to WAJ on progress of activities during implementation. The PIUs will be fully integrated and include focal points from within the company responsible for engineering, procurement, FM, along with environmental and social staff who have a knowledge of the national environmental laws and regulations, and experience managing environmental, health and safety and social risks and supported by Technical Assistance where needed. Additional backstopping support will be provided through Technical Assistance (TA), described herein with the WAJ PMU.

[42] The PMU Director and two project management experts are currently financed through support from KfW through the end of 2023, however SOP-1 will finance this position from 2024 through the close of the project.

78. **MWI will be responsible for implementing actions under Component 3 on water allocation planning, hydro-informatics and drought risk management.** MWI, through the Drought Management Unit and the Water Information Services Department, will lead the development and implementation of the drought monitor information services in close coordination with JVA and WAJ. MWI will be responsible for handling contracts, TA, and capacity building in close coordination with water sector entities on the technical aspects related to the preparation/design and implementation of these activities to ensure their effective adoption and sustainability (e.g., water information systems and decision-making tools within MWI, JVA and WAJ, drought preparedness plans by WAJ, JVA and other beneficiaries, water allocation planning within MWI, JVA, WAJ and others as the case may be). The coordination among water sector entities will be ensured through a technical committee, which will be established and maintained during implementation. MWI will also coordinate with broader interagency groups on drought related activities under SOP-1 as needed through its Drought Management Unit in accordance with its mandate. The specific roles and responsibilities and coordination mechanisms of the technical committee and the Interagency Committee for Component 3 will be detailed in the Project's Operation Manual. For MWI, focal points with relevant expertise will be responsible for implementing the environmental and social requirements of their agencies' actions under the project and reporting to the central PMU's environmental and social team. MWI will prepare and submit progress reports to WAJ PMU on a quarterly basis.

79. **JVA will be responsible for implementing actions under Component 3 on water storage.** JVA, through the Dam Management Unit, will lead the development of studies that characterize water storage rehabilitation needs. JVA will co-lead the development of drought preparedness plans in piloted areas and water accounting systems with MWI in targeted irrigation systems and will also contribute to development of tools and information systems supporting water allocation decision-making. For JVA, focal points with relevant expertise will be responsible for implementing the environmental and social requirements of their agencies' actions under the project and reporting to the central environmental and social team. JVA will prepare and submit progress reports to PMU on a quarterly basis.

80. **Co-financing sources are AFD and GCFF.** The GCFF financing is channeled through World Bank systems, following policies and procedures for World Bank supervision and financing will be disbursed on a pari passu basis. Anticipated AFD support will be managed as joint, co-financing, following the World Bank-AFD Co-financing Framework Agreement. Following provisions in this agreement, the World Bank will provide technical oversight, procurement oversight, FM oversight, and environmental and social oversight. Procurement will adhere to both World Bank and AFD debarment lists. Disbursement will be pari passu for the whole project.

81. **Alignment with Development Partners will be facilitated through existing coordination mechanisms.** These include regular coordination meetings aimed at leveraging collective efforts to support the government's priorities, while also avoiding overlaps and redundancies between the various programs financed by different partners. The coordination mechanism is typically chaired by one of the development partners on a fixed-term, rotating basis, and is currently led by Germany. Specific technical work groups within this coordination mechanism will provide opportunities to exchange experiences, align recommendations and ensure good international industry practices are mainstreamed, particularly around core issues relating to NRW, EE, and other key areas. These mechanisms will contribute to government efforts to provide accurate and updated systems to track all activities funded by development partners and to generate consensus around the pipeline of priority programs for technical and infrastructure support.

82. **Implementation will be guided through a Project Operations Manual (POM).** The POM will be prepared by WAJ PMU, with each of the respective implementing entities responsible for preparing the respective inputs. The POM will be adopted by all implementing agencies within three months of project effectiveness and describe the procedures for management, implementation, M&E of the project, including, but not necessarily be limited to, the following: (i) project objectives, components and activities; (ii) implementation arrangements; (iii) implementation strategy and work planning; (iv) management and oversight of procurement; (v) management and oversight of FM; (vi) management and oversight of environmental, social and occupational, health and safety; (vii) the FM responsibilities and duties, the flow

of funds, budgeting, accounting, financial reporting, and financial auditing; (viii) application of the Government and World Bank Anti-Corruption Guidelines; and, (ix) reporting requirements to and templates.

B. Results Monitoring and Evaluation Arrangements

83. **WAJ will have the overall responsibility for monitoring, evaluation, and reporting of results at the project implementation level, supported by the PMU and all of the implementing agencies and in coordination with the Steering Committee.** All Implementing Agencies will have a dedicated M&E focal point, who will be closely working with the M&E Specialist in the PMU. The central NRW Unit, reporting to the Minister of Water and Irrigation, will monitor overall project NRW implementation in conjunction with WAJ and the WCs following it's established mandate. However, in order to prevent reporting overlaps, the central NRW unit will provide the results of its assessment and audit of NRW reduction activities under the project to WAJ PMU for inclusion in the consolidated report to the World Bank and will also provide its audit reports separately to the Steering Committee. WAJ PMU will report on SOP-1 indicators to the Government and the World Bank on a semi-annual basis. An updated Annual Work Plan will be prepared, with detailed quarterly reporting to the World Bank and monthly reporting to the Steering Committee. Details of monitoring and reporting arrangements will be included in the POM to be prepared by the Borrower in form and substance acceptable to the World Bank prior to loan effectiveness. The POM will capture the results framework, including outputs and intermediate outcomes to measure progress toward the PDO. The POM will also incorporate in detail the processes of monitoring SOP-1 actions, sources of data, frequency of collection, different roles and responsibilities, and reporting requirements.

84. **The results indicators are straightforward and adequate to measure the progress with improvement of the overall efficiency of the water sector.** The quantitative data and information required for verification of results achievement can be obtained from financial, accounting, and operating records of WAJ and the water companies. The technical indicators are based on standard industry practices. Results indicators for NRW differ from the 2022 Budget KPIs, presented as percent reduction in NRW, because varying water supply availability alters the percentage values without NRW reduction measures and recent installation of bulk meters across the country enables monitoring of volumes of water delivered and billed (i.e., indicators for this Project, aligned with industry standards). The KPI for energy utilization is also specific to project interventions, rather than the KPI which presents percentage of consumption of electricity, so that Project monitoring directly reflects Project interventions and not overall operations in the water sector. The qualitative information (i.e., regulatory actions or plans approved) can be monitored through online government portals and reports, as such the installation of a SCADA system at the water companies, will allow the WC operators in its main office to remotely monitor and control the status of water supply within its service area. The SCADA will provide real-time monitoring of operations of pumping stations to detect shutdown and water leakage management by monitoring of historical flow and pressure data in each DMA to detect water leakage, analyze the actual pressure points and dispatch staff to reduce NRW. WAJ has developed and implemented Energy management System (EnMS) with the water companies, which shall provide a systematic, data-driven, and facts-based process, focused on continually improving energy performance to ensure effective and measurable results over time. The EnMS is based on Plan-Do-Check-Act continual improvement framework and shall incorporate energy management into existing water companies' practices. Therefore, involved entities, according to its role, will have to monitor, measure, analyze, evaluate, audit, and conduct management review(s) of energy performance and report accordingly. The strengthening of drought management systems and water allocation systems and institutions will be monitored through reports provided by the consultancy firms proving the technical support, as well as through the progress report elaborated by the PMU, which will be responsible of collecting evidence of results. The M&E framework will leverage data collection activities undertaken by the IVA for PBCs.

C. Sustainability

85. **The SOP mechanism, through its nature of long-term engagement to support infrastructure investment and institutional strengthening, enhances the overall sustainability of efficiency interventions.** SOP-1 supports an improved solution to water supply efficiency by addressing NRW, improving EE, and strengthening institutional processes. The water sector will not be financially sustainable over time without addressing efficiency, especially with the AAC set to provide a significant amount of desalinated water by the end of the decade.

86. **SOP-1 will support significant improvements in O&M cost recovery.** SOP-1 will finance efficiency gains that will improve O&M cost recovery in the medium and long term. The financial analysis in section IV.A provides further details.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis

Technical Analysis

87. **The project supports implementation of the Financial Sustainability measures to facilitate closing the operational deficit in the water sector, improving institutional performance and service delivery while responding to water scarcity and variability.** MWI ,with the support of GOJ and technical and financial partners, has pursued measures since the 1960s to forecast and respond to water scarcity in Jordan including: (i) the development of water master plans and strategies (currently, the GOJ is updating the 2016-2025 Strategy); (ii) reallocations from agriculture to domestic water supply; (iii) reuse of wastewater in agriculture; (iv) improvements to water productivity in agriculture, and; (v) a program of PPPs to augment bulk water availability. The government's current reform efforts, overseen by MWI, spans the full range of these water sector institutions and links to relevant actions in the health, agriculture, energy, and other relevant sectors.

88. **Approved by the Cabinet of Ministers in November 2022, the FSR outlines a set of policy and investment measures that will close the sector operational deficit by 2029 and reduce debt accumulation (from US$17.7 b to US$11 b in 2040).** In 2019 revenue covered 78 percent of O&M costs and only 68 percent of expenditure including PPP lease payments. With planned supply-side interventions and without government action on demand control and efficiency, sector accumulated debt is forecast to rise to just over US$20 billion by 2040, based on debt service accumulation and forecasted annual deficits rising from US$352 million in 2023 to just over US$1.1 billion by 2040.[43] The FSR outlines five levers to address the cost and revenues in the sector, the Levers are: (i) Optimize efficiency through NRW reductions, EE and RE, and limiting water abstractions by agriculture, all of which would help improve the financial sustainability of the water utilities; (ii) Manage existing debt by restructuring domestic debt, and limiting the buildup of PPP arrears; (iii) Minimize cost of capital for New Water Systems with grant financing, concessional financing, and improved PPP design; (iv) Minimize OPEX costs of new water systems through load shifting, expanding storage capacity, and PPP risk sharing of energy costs; and (v) Mobilize predictable revenue flows through tariff reform with social safety net support for poor and vulnerable populations. The NRW component of the FSR efficiency measures requires an investment of US$1.8 billion CAPEX over 10 years and US$85 million of OPEX and aims to reduce NRW from 53 percent to 25 percent by 2040. The EE and RE component of the FSR requires an investment of US$262 million CAPEX ($US 208 million EE and $US 54 million RE) and will yield 257 GWh/ year in energy savings while adding 193 MWh/year in RE capacity. The five FSR levers are expected to bring O&M cost recovery to 100 percent by 2030 and reduce sector debt to $US 11 billion in 2040, compared to just over US$20 billion without action.

[43] Projections of accumulated deficit by 2040 is derived from the FSR scenario which includes the AAC and inaction on CPS levers.

89. **Conservation in the domestic sector is prioritized in the FSR and NWS, reflecting the reality that half of the water that is distributed in municipal systems is lost through technical and commercial losses.** Water demand for domestic household needs has more than doubled over the past 30 years from 214 to 457 MCM/yr. Around half of this increase in supply to domestic households has come from new sources (water drawn unsustainably from fossil aquifers) and half from reallocations of water away from agriculture. With this increasing demand, there is an urgent need to reduce NRW as over 200 MCM are being lost annually. Progress in reducing NRW has been challenging due to Jordan's topography and the insufficiency of water which hinders the implementation of NRW reduction activities and weakness in domestic water management by its utilities. Many interventions in this area have been tried with limited success, primarily because of engagement/contracting methods, lack of 24/7 water and lack of follow-on maintenance and monitoring of NRW reduction (See Lessons Learned Reflected in Project Design). "NRW reduction," in its broadest sense is not taught in universities or technical colleges, nor in many water industry training institutions around the world. As a result, employees with the necessary skills are not widely available. Addressing this issue will require accepting the widespread challenges and consequences associated with NRW and then developing appropriate training materials, methods, and institutions.

90. **Increasing water efficiency in the agricultural sector, including scaling up use of TWW, is also a priority in the FSR and NWS.** Water productivity in agriculture has improved steadily in Jordan through a combination of water saving technologies and water saving policies. However, there is limited scope to further improve water productivity in Jordan without also strengthening agricultural value chains that focus on higher-value and higher-salinity-tolerant crops. Jordan leads the region in water reuse for irrigated agriculture, with a quarter of the water for agriculture being generated from TWW.[44,45] Investments needed to ensure the continued safe functioning of water storage systems which are an essential part of the TWW reuse system in Jordan.

91. **Electricity cost reduction is included in the FSR as electricity accounts for half the costs in the sector**. As a result of Jordan's natural hydrogeology and topography, significant energy is inherently required for pumping water to urban and agricultural areas – ageing infrastructure only increases the high energy requirements of the sector. The water sector is the largest single energy consumer in Jordan, and half of water utilities' operational costs are for electricity. EE improvements and RE utilization are national priorities for more sustainable management of the water sector and will have a direct impact on the financial sustainability of the water sector by reducing operational costs

92. **Given Jordan's extreme water scarcity and frequent and intense droughts, improved water allocation will support different mechanisms to enable efficient and fair management of water shortages.** Tools that underpin assessment of water availability and decision making related to water allocation, particularly monitoring, and forecasting under drought conditions when water availability becomes increasingly scarce, are necessary to ensure that allocation responds to changing conditions, improving beneficial use. Strengthening institutions responsible for planning and allocation of water will increase opportunities for participation and negotiation with different stakeholders to enable a more efficient and fair management of the risks of shortages. Water storage systems play an important role in an efficient response to highly variable precipitation. For example, storage helps to minimize water spilling during high-flow years which can help maximize its use during drought years. Storage is also necessary for blending and timing of deliveries of TWW facilitates its use in agriculture. Continued safe and competent operation of storage facilities will underpin an efficient response to variable water availability.

[44] Jordan is second only to Israel in share of withdrawals from TWW; Figure O.2 World Bank 2018. Beyond Scarcity: Water Security in the Middle East and North Africa.

[45] Treated wastewater from the modern As-Samra wastewater treatment plant in Amman provides 133 MCM/year to irrigate crops in the Jordan Valley and other centralized wastewater treatment plants in larger cities also provide TWW for reuse in agriculture, although effluent water quality from some plants is a reportedly a challenge.

Economic and Financial Analysis

93. **Economic benefits of SOP-1.** The main economic benefits include: (a) increased water revenues as a result of NRW reductions; (b) decreased operational costs due to energy savings and energy load reductions during peak hours; (c) reduced GHG emissions as a result of increase renewables and EE gains; and (d) increased consumer surplus through a reduced reliance on water tankers. For the economic analysis, the Net Present Value (NPV) is calculated with a discount rate of 6 percent and with a 20-year horizon. More details are provided in Annex 2**.**

94. **Conceptual approach to evaluation of economic benefits.** NRW is currently 50 percent in Jordan, severely impacting revenues for WAJ. As a result of the Project, overall NRW is expected to be reduced through the reduction of physical and commercial losses resulting primarily in increased water revenues, and a reduction of the operating deficit. Reducing physical losses is expected to increase service continuity, especially in the regions with lowest levels of service. As a result, those regions will reduce their dependence on private and informal water sources which are more expensive. Residents will benefit from financial savings as they replace water from tanker trucks with water from their cheaper piped connection. Increased EE and reduced energy supply costs are expected as a result of energy savings leading to significant GHG emissions reductions. Given the current levels of operational efficiency, the Project is expected to strengthen the water sector's financial sustainability in the long term due to operational cost savings leading to a reduction in dependence on subsidies.

95. **Results:** A cost benefit analysis was carried out with costs estimated at economic prices. The economic analysis yielded an economic NPV of US$125 million and economic rate of return (ERR) of 13.6 percent exclusive of the shadow price of carbon and an economic NPV of US$165 million and ERR of 15.7 percent inclusive of the shadow price of carbon.

Table 2. Economic Rate of Return (ERR) and Net Present Value (NPV)

Scenario	ERR (percent)	NPV @ 6 percent (US$, millions)
Without shadow price of carbon	**13.6**	**125**
With shadow price of carbon	**15.7**	**165**

GHG Emissions Mitigation

96. **A GHG analysis was carried out on SOP-1's increased EE and NRW improvements**. The increased EE actions and reduction of NRW will lead to energy savings of about 81 GWh/yr. Electric power generation in Jordan relies predominantly on fossil fuels with significant impact on the environment. The percentage of oil, coal, natural gas, and oil shale in the energy mix for 2019 was 89 percent with 11 percent RE resulting in an emissions factor of 0.516 tCO_2/MWh. Reductions in GHG emissions of 41,796 tCO_2 equiv. per year, or 697,993 tCO_2 equiv. over the economic life of the Project, are expected under the Project. The NPV of the Project includes US$19.8M-US$39.7M from GHG emissions avoided using the recommended high and low values for the shadow price of carbon.

Financial Analysis

97. **Conceptual approach to financial analysis**. The financial impact of project activities is assessed by the FIRR derived from the economic cost benefit analysis to conclude whether the project is financially sustainable. In order for the project to be financially sustainable revenues and cost savings must exceed capital expenditures and operations and maintenance costs. Financial calculations consider the financial revenues and costs in the with/without project scenarios from the economic analysis, excluding non-cash generating benefits (consumer surplus, GHG emissions).

Table 3. Financial Rate of Return (FIRR) and Net Present Value (NPV)

Scenario	FIRR (percent)	NPV @ 6 percent (US$, millions)
SOP-1	**10.3**	**70.5**

98. **Results:** The financial analysis yields an NPV of US$70.5 million and FIRR of 10.3 percent implying that the project is financially sustainable. Water revenues are expected to increase by US$377 million over the life of the project while energy costs, the largest operating cost for the water sector, is expected to be reduced by US$183 million over the life of the project. The increase in revenues and decrease in operating costs are expected to exceed capital expenditures and additional O&M of the project by 2033.

99. The financial viability of the project relies on the financial viability of WAJ. The financial performance of WAJ is measured through improvements in O&M cost recovery, and WAJ's accumulated deficit (Annex 2). As of 2021, the operating cost recovery ratio of WAJ is 78 percent and is expected to decline below 65 percent by 2028 without intervention. The annual deficit of WAJ in 2021 was US$277 million and accumulated deficits have reached US$ 3.8 billion as of 2021. Without intervention, annual and accumulated deficits are expected to worsen with the planned 300 MCM AAC expected to result in a large increase in WAJ's capital and operating expenses. While the final costs of the AAC are not yet known but modelling suggests capital expenses to be at least US$3 billion. The AAC is expected to require 300 MW of installed electricity generation capacity, even with a reduced rate of 57 fils/kWh these additional costs will create a significant financial constraint for WAJ.

100. The FSR outlines a set of no-regrets efficiency measures (Annex 6) that will help return the water sector to operational cost recovery. SOP-1 is the first step in implementing these efficiency measure that will bring a measurable improvement to WAJ revenues and a reduction in WAJ operating costs. The increase in revenues through NRW reductions and lowered operating costs are expected to improve the operating cost recovery ratio to 85 percent prior to the AAC coming online. In addition, WAJ's annual deficits will decrease significantly, resulting in WAJ's accumulated deficit lowered by US$ 686 million in 2040 compared to the without project scenario.

B. Fiduciary

Financial Management (FM)

101. **The World Bank assessed the FM systems of the WAJ, MWI, JVA, and the three WCs.** The FM risk is rated "Substantial", and the residual overall FM risk remains "Substantial" even when considering the risk mitigation measures planned. Annex 9 provides additional information on the assessment and the recommended FM risk mitigation measures. The detailed FM capacity assessment and arrangements are available in the World Bank project files.

102. **WAJ will act as the main focal point for FM affairs and will be responsible for** (i) preparing and consolidating the annual project budget; (ii) monitoring the financial progress; (iii) compiling the Semiannual Interim Unaudited Financial Reports (IFRs) and submitting them to the World Bank 45 days after the end of the semester, (iv) and contracting an external auditor to audit the project's financial statements and submit them to the World Bank, six months after the end of the calendar year. Given the limited experience of WAJ in World Bank FM and disbursement policies and the expected high workload on the finance staff, the project will recruit a Finance Officer familiar with similar operations to manage the project's FM and disbursement functions. The World Bank will also provide training to WAJ, MWI, JVA, and the three water companies on the World Bank FM and disbursement guidelines.

103. **The Project will use a Designated Account (DA) and interim financial reports (IFR).** A US Dollar Designated Account (DA) will be opened by WAJ in the National Bank of Jordan to receive the loan proceeds to finance the project's activities. MWI, JVA, and the three water companies can (i) ask WAJ to pay vendors/suppliers on their behalf or (ii) open a Bank account (project account) in an acceptable bank to receive the advances from the DA. The bank accounts (the DA and project accounts) will solely be used for the project. The advances from DA to the project accounts will be replenished, subject to submitting supporting documents showing the eligibility of expenditures made. Furthermore, the project can use Reimbursement upon documentation of project related expenditures as an alternative method of

disbursement for this Project. Incremental operational expenditures incurred for the achievement of the PBCs will be disbursed to the Government Single Treasury Account at MOF on a reimbursable basis in alignment with the project eligible expenditure table and aligned to WAJ, MWI and JVA budget lines.

104. **WAJ, MWC, and YWC face financial sustainability challenges.** The financial position of WAJ, the MWC, and YWC as of December 31, 2021, indicates concerns about their financial sustainability due to high operating costs and debt. WAJ, MWC, and YMC rely heavily on financial support from the central government to cover their financial costs and continue operating. A FSR was developed and approved by the Cabinet of Ministers in November 2022. Implementing the FSR is key to restoring the financial sustainability of the sector, including WAJ, MWC, and YWC.

105. **The project is an IPF with a result-based financing modality using a set of PBCs.** For disbursement of funds associated with PBCs, there are two disbursement triggers (a) eligible expenditures incurred and paid, and (b) PBCs achieved and verified. Eligible expenditures will be reported semi-annually to the World Bank through semiannual IFRs, which are subject to review by the external auditor of the Project. The PBCs will be verified following the verification protocols agreed upon with the government. The loan proceeds for expenditures incurred for implementing PBCs following the Eligible Expenditure Program will be transferred to MOF Treasury Single Account. Any balance of the allocated Eligible Expenditure Program disbursement not disbursed at any disbursement cycle may be carried forward to be paid during a subsequent disbursement cycle once there is evidence that the PBC has been achieved.

106. **The Project will be subject to annual financial audit.** WAJ will contract an external audit firm to perform a financial audit of the project's annual financial statements following the Terms of Reference (TOR) acceptable to the World Bank. WAJ will contract an audit firm within six months of project effectiveness.

107. Annex 9 provides additional information on the FM assessment and the recommended mitigation measures.

Procurement

108. **The procurement assessment** covered the implementing agencies: WAJ, MWI, MWC, YMC, AWC, and JVA. The assessment covered the legislation, the procurement organizational chart, the procedures, the track records of procurement processing and contract management, procurement capacity and staffing, IT systems, audit (internal and external).

109. **All implementing agencies have extensive experience in implementing donor-funded projects**, however the entities have no exposure to World Bank procurement requirements, raising the risk profile. WAJ will coordinate and support procurement, and project activity procurement will be carried out by individual implementing agencies (MWI, WAJ, MWC, YWC, AWC, and JVA). As per public procurement bylaw, WAJ, WCs and JVA are categorized as "units" and MWI as "entity". Only MWI is to process procurement centrally i) Government Tendering Department for works and related technical consultancy, and ii) Government Procurement Department for goods and consulting services.

110. **Project applicable Regulations and Guidelines.** Procurement under SOP-1 will be carried out in accordance with the World Bank's Procurement Regulations for IPF Borrowers for Goods, Works, Non-Consulting and Consulting Services, dated November 2020 ('Procurement Regulations'). SOP-1 will be subject to the World Bank's "Guidelines on Preventing and Combating Fraud and Corruption in projects Financed by IBRD Loans and IDA Credits and Grants", October 15, 2006, revised in January 2011, and July 1, 2016. SOP-1 will comply with vendor eligibility lists of the World Bank and AFD, published on the World Bank and AFD websites, respectively, and the Covenant of Integrity shall be annexed to bidding documents.

111. **Project Procurement Strategy for Development (PPSD)**. The PPSD was developed to strategize reaching the PDO while observing value-for-money and fit-for-purpose procurement criteria. The majority of the works contracts are expected to be valued at around US$10 million, and competitive participation of national firms is expected based on

procurement experience in the sector. International competition is expected for some of the contracts to supply and install goods, especially meters, and IT solutions and equipment. The PPSD will support development of the initial procurement plan for the life of SOP-1 and on defining the market approach options, the selection methods and contractual arrangements, which determine required level of review by the World Bank. The project shall use the "Systematic Tracking of Exchanges" (STEP), to plan, record, track procurement transactions and for contract management purposes. As per World Bank policy, purchase of solar panels will ensure that no forced labor was observed in the production of panels, and starting July 2023, for aligning with fit-for-purpose, value-for money, and sustainability principles (climate change, environment considerations), international procurement of works and goods will use rated criteria for evaluation.

112. **The overall procurement risk is deemed Substantial.** The following mitigation measures will be implemented: GOJ will (i) Establish an efficient Steering Committee to monitor and provide support for project implementation, (ii) build capacity building for PPP selection, drafting technical requirements, procurement processing and contract management, (iii) mandate business response timelines and proper preventive planning, (iv) support enrolment of the stakeholders in JONEPS and provide adequate training in using its portal functions, (v) update the procurement plan, if seen relevant, to align with the annual work plans, (vi) delineate the procurement processing in POM with clear roles and responsibilities, (vii) train stakeholders on World Bank procurement procedures; and (viii) ensure that PBCs are designed to include procurement risks inherent to large works and consultancies contracts.

C. Legal Operational Policies (OP)

113. OP 7.50 is applicable to this project because the Project will finance NRW reduction and infrastructure rehabilitation activities located in municipalities that rely on the Jordan River system and Disi Aquifer, i.e. two of the primary water sources for water supply, which are considered international waterways. The exception to the riparian notification requirement according to paragraph 7(a) of the Policy applies because activities are limited to rehabilitation or replacement of the water network with the aim of reducing leakage and losses, which will not exceed the original schemes, change their nature, or expand their scope and extent as to make them appear a new or different scheme, and therefore will not result in any negative impact on water quantity and quality in the international waterways. The exception to the notification requirement was approved by the Regional Vice President on March 30, 2023. SOP-1 will not trigger OP 7.60 related to the Disputed Areas.

	Triggered?
Projects on International Waterways OP 7.50	Yes
Projects in Disputed Areas OP 7.60	No

D. Environmental and Social

114. **The Environmental and Social Framework (ESF) is applicable to SOP-1.** The following standards are relevant: ESS1, ESS2, ESS3, ESS4, ESS5, ESS6, ESS8, and ESS10. The project is expected to have positive impacts including improving the efficiency of water services (Component 1), improving water availability, sustainable management and improvement of efficiency of the water sector by reducing GHG emissions (Component 2), strengthening the institutional capacity to enable efficient water allocation and storage (Component 3), and enhancing the sector's environmental and social sustainability (Component 4).

115. **The Project Environmental risk is rated Substantial.** The activities under components 1 and 2 will be geographically spread across different governorates of Jordan. The exact geographical locations and the scale of interventions/sub-projects will be selected during implementation according to criteria set out in the project documentation and government prioritization. SOP-1's environmental risks relate to the construction and rehabilitation of the water supply network and hazardous waste. In addition, there is a limited risk of impact on workers' health and environmental pollution from potential chance uncovering of old asbestos pipes during water network rehabilitation. In addition to risks described above, rehabilitation of groundwater wells is associated with occupational health and safety, generation of hazardous waste risk during rehabilitation, cleaning and disinfection activities, use of chemicals, and low potential of increase in water extraction affecting the aquifers safe yield during operation. The potential risk of impacting biodiversity conservation is expected to be low during rehabilitation/restructuring of the water networks given that most of these works will be carried out in urban areas that do not have high biodiversity conservation value. Component 3 is proposed to support feasibility and technical assessment studies to advance dam rehabilitation, and where the risk of impacting on biodiversity conservation according to the mitigation hierarchy will be assessed under the relevant E&S assessment studies financed under component 3. Risks of biodiversity conservation impacts were identified related to dam rehabilitation assessment studies (Component 3). Drought and water allocation contingency planning under Component 3 is expected to be associated with the reuse of TWW as an alternative irrigation water source –currently practiced in the lower Jordan Valley. If treatment is not done properly, there is a risk of pollution and health risk for farmers using the TWW for irrigation purposes. Water allocation planning parameters that may affect water quality of TWW which will be assessed during preparation of water allocation and contingency plans. No significant impact on cultural heritage resources is expected, however, chance find of cultural heritage resources is possible during implementation.

116. **Social risks are rated Moderate.** The main social risks are related to small to moderate-scale civil works under Component 1, across the large geographic scope of the Project, including relaying/rehabilitating existing distribution pipes and household water connections, as well as for enhancing in-network water storage (e.g., above ground, and/or elevated in-network storage-tanks). Component 2 will finance works to replace water pumps within existing water pumping stations. Temporary community health and safety risks associated with these types of small to moderate works include road safety and traffic, noise, and dust as well as worker health and safety and labor and working conditions. These physical works also have the potential to cause socio-economic and hygiene impacts from water service disruption, especially if the works are not properly coordinated amongst municipalities and utilities. In addition, rehabilitating household connections have the potential to create moderate social tensions or exclusions if areas or neighborhoods are not selected in an equitable and transparent manner. Works will take place within existing rights-of-way and sites. However small parcels of land may be required under Component 1 and 2, which will become apparent as the detailed designs are developed. Component 3 will support TA for drought management and water allocation and studies for rehabilitaiton of water storage systems. These studies have potential downstream social risks related to the distributional equity of water allocations, and safety risks for affected communities related to rehabilitation of water storage. The risk rating considers the experience of implementing agencies of delivering similar projects according to environmental and social requirements of international donors and financial institutions, although a strong environmental and social organizational structure across 6 implementing agencies, as well as capacity building on the ESF, is needed. The selected PBCs reinforce delivery of activities already including in the program, they do not introduce additional social risks.

117. **Risks of Sexual Exploitation and Abuse / Sexual Harassment are considered Low.** The Sexual Exploitation and Abuse / Sexual Harassment assessment of the proposed project has assessed the the risk for SEA/SH as Low. The project entails small to medium-scale civil works at contained sub-project sites, where no significant labor influx is expected, since most labor will be sourced from readily available local labor. The main risks are related to works being

implemented within densely populated neighborhoods, proximity to schools and other institutions, and geographically dispersed activities.

118. **An ESMF has been prepared, reviewed and disclosed for consultation on May 11th 2023, and a final ESMF was reviewed, cleared and disclosed in-country and the World Bank website on (May 22,2023).** The ESMF sets out the principals, rules and guidance and procedures to assess environmental and social risks and impacts for all project components and the measures and plans to mitigate adverse impacts. In addition, it includes: roles and responsibilities, capacity building, monitoring and reporting requirements, a screening methodology (including exclusion criteria) and guides the process to prepare the appropriate mitigation measures and instruments for the various sub-projects (e.g. ESIA/ESMP, ESMP) and Asbestos contained Material Management Plan, the review and clearance process for such instruments and E&S annual audit.

119. **A Stakeholder Engagement Plan (SEP) for SOP-1 has been prepared, reviewed, consulted, and updated and cleared on May 22, 2023.** SOP-1 has a wide range of stakeholders including beneficiaries, project-affected people, municipalities, development partners, other public sector institutions, and civil society. Vulnerable groups or individuals are considered to be members of the urban poor, women, youth, elderly, refugees, the disabled, who might be disproportionately affected from project activities. The environmental and social risks and benefits were consulted during project preparation with a range of stakeholders, including women's organizations. The SEP was consulted and disclosed in May 2023 and it: (i) establishes a systematic approach to stakeholder engagement; to promote and provide means for effective and inclusive engagement with project -affected parties, including vulnerable groups, throughout SOP-1 implementation; (ii) outlines methods for appropriate project information on environmental and social risks disclosure to stakeholders in a timely and accessible manner. A Project level Grievance Mechanism building on existing systems, is elaborated in the SEP.

120. **The Appraisal Environmental Social Commitment Plan (ESCP) has been prepared, reviewed, and cleared by the World Bank and disclosed in May 22, 2023**. The ESCP sets out the Project environmental and social commitments including institutional arrangement at the implementing agencies; implementation of the Environmental and Social Management Framework (ESMF), Resettlement Framework (RF), Labor Management Procedures (LMP), and Stakeholder Engagement Plan (SEP); preparation of appropriate sub-project instruments (ESMP/ESIAs and RPs).

V. GRIEVANCE REDRESS SERVICES

121. Communities and individuals who believe that they are adversely affected by a project supported by the World Bank may submit complaints to existing project-level grievance mechanisms or the World Bank's Grievance Redress Services (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the World Bank's independent Accountability Mechanism (AM). The AM houses the Inspection Panel, which determines whether harm occurred, or could occur, as a result of World Bank non-compliance with its policies and procedures, and the Dispute Resolution Service, which provides communities and borrowers with the opportunity to address complaints through dispute resolution. Complaints may be submitted to the AM at any time after concerns have been brought directly to the attention of World Bank Management and after Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's GRS, please visit http://www.worldbank.org/GRS. For information on how to submit complaints to the World Bank's AM, please visit https://accountability.worldbank.org.

VI. KEY RISKS

122. The risks to achieving the PDO and associated results are rated as Moderate. This assessment is based on the Operations Policy and Country Services guidance on residual risk rating.

123. The Overall Risk for SOP-1 is rated as **Moderate**. Due to the regional political context, the macroeconomic environment in Jordan, and the dynamics with stakeholders vis-à-vis the water sector, there are inherent risks that could adversely impact the GOJ's ability to implement SOP-1. This project couples institutional reform measures with technical innovation, where success of the planned actions will either require broad-scale community support and technical capacity within the water sector. Major inherent risks to project delivery along with mitigation measures are described below along with an assessment of residual risk.

124. **Political and governance**. Several inherent political and governance risks were identified including political unrest in the region which might trigger overtaxing water service infrastructure and/or necessitating re-focused resources in the water sector. Water, energy or food insecurity in Jordan or the region might create a situation that disrupts the water sector and realigns priorities, such as a major electricity price hike, waiver of agricultural water quota enforcement or other factors that may disrupt political will for water-sector financial sustainability and advancement of the government's Strategy. Mitigation measures such as the embedded governance support for the water sector provided by development partners such as the United States and Germany, reduce the governance risk of the Project. The residual risk is assessed as **Moderate**.

125. **Macroeconomic** challenges in Jordan, as well as global and regional financial trends, may further disrupt the Jordanian economy and exacerbate cash-flow issues in the water sector. Potential knock-on effects of macro-economic disruption include inability of the government to implement the Project, electricity price hikes which negatively affect the water sector, or performance failure in existing water supply or TWW reuse systems (e.g., Disi pipeline or As Samra Wastewater Treatment Plan) which are essential to supplying water for productive uses, and on which basis performance improvement plans are anticipated. The inherent macroeconomic risks are Substantial. SOP-1 proposes to support efficiency measures to reduce the risk of external shocks on water sector performance. The residual risk assessed are **Substantial**.

126. **Sector Strategies and Policies**. The GOJ has developed a number of sector strategies and policies in the water sector and strives to implement these. The government adopted the FSR in 2022 and adopted the National Water Sector Strategy in 2023, recently updated the Non-Revenue Water Strategy in 2022, and is developing NRW Action Plans and updating the Capital Works Investment Plan (on-going, expected in 2023). These strategies and plans will serve to underpin and guide the World Bank's support. Therefore, the inherent and residual risk of sector strategies and policies is assessed as **Low**.

127. **Technical Design of the Project**. SOP-1 supports government reform for improved efficiency and sector performance across a number of parameters, where results achievement will require adoption of innovative approaches, including mobilizing private sector support. NRW reduction, dam rehabilitation, water allocation and drought management systems are inherently technical complex, therefore the inherent technical design risk is Substantial. However, the GOJ has established experience in delivering NRW, EE and drought management results and has already piloted many type of innovation envisioned under this Project, which reduces the residual risk. Through the FSR process, through the support of other donors (i.e., GIZ, AFD, USAID), and through project preparation support for readiness and technical soundness, the team will build capacity for implementation of the innovative approaches outlined in SOP-1 to reduce the residual risk. In addition, the PMU will have dedicated TA support and JVA and MWI will also have dedicated TA support, to bolster the government's technical capacity and mitigate risk. The residual risk of the technical design is assessed as **Moderate**.

128. **Institutional Capacity for Implementation and Sustainability**. MWI and WAJ have successfully implemented other donors support the sector, including under results-based support, with mixed results (largely positive) and several lessons learned in terms of results achievement and sustainability that have been incorporated into the design of this Project. JVA receives TA from development partners on dams-related issues, but has not implemented similar investment projects recently. It has been several years since the water sector entities implemented a World Bank project, however, other donors with active projects are following comparable models. In addition, several other donors are mobilizing financing to support implementation of the FSR, which may exceed the clients' capacity for implementation. Therefore, inherent institutional capacity risks are rated Substantial. Mitigation measures for these risks include enhancing of the existing capacity at the level of the institution as follow: The PMU, based in WAJ, will implement, and oversee Components 1 and 2 and to support ESF compliance for all Components. WAJ is deemed to have sufficient capacity and experience to deliver results. The three Water Companies have varying track-records in terms of implementation and therefore, the level of responsibility carried by each WC will vary accordingly. MWI and JVA will carry out studies and improve innovative tools to inform decision making and their capacity to carry out these actions will be appropriately supplemented by TA. The Core Donor Group, and a sub-committee to coordinate planning and implementation of NRW-related actions, will be used to promote complementarity among development partners. The residual risk is deemed **Substantial**.

129. **Stakeholders**. Water sector efficiency investments involve a nuanced blend of advanced technical analysis, social analysis, and political judgement – amidst a complex dialogue among political factions, stakeholders, and development partners - which increases the risk of failure to deliver results. Inherent risks include limited stakeholder understanding and acceptance of needed reforms such as reduction of NRW and water allocation related measures which requires more extensive upstream work on the part of the GOJ than currently envisioned to mobilize sector reform. In addition, the six implementing agencies have a limited track-record on internal coordination and coordination with local government entities, which also raises the stakeholder risk for this Project. The ESF Framework documents clarify procedures for stakeholder communication and engagement and sub-component 1.3 enhances stakeholder communication and dialogue. During finalization of the ESF instruments, additional mitigation measures to reduce the impact of these risks became clear, such as dedicated focus on stakeholder engagement, public awareness campaigns, capacity building for stakeholders internal to GOJ and information and data transparency will be integrated into Project design in so far as possible, therefore, the residual risk is **Moderate**.

130. **Fiduciary. The Procurement risk rating is Substantial**. Taking into account the procurement experience of the World Bank's Jordan portfolio, and despite the general adequate capacity of the project's stakeholders and pertinence of the project design, the following risks were identified: (i) the water sector does not have recent experience executing World Bank projects; (ii) coordination with the numerous project entities and unit; (iii) challenged capacity in defining TOR and technical specifications and bidding requirements for evaluation purposes, (iv) timely PPP design, selection and management, (v) lengthy procurement decision making and bureaucracy bottlenecks, (vi) limited contract management capacity, (vii) limited digitalization and lagging in using e-procurement platform (JONEPS), specifically in abiding by complaint mechanism and publication of notices and contracts, (viii) weak procurement planning; and (ix) PBC allocations that may be linked to procurement risks inherent to performance of large works and consultancies contracts.

131. **The FM risk rating is Substantial.** The FM risks include: (i) WAJ, MWC, and YWC are financially unsustainable and heavily rely on government support, (ii) implementing agencies lack experience in the World Bank FM policies, (iii) multiple implementing agencies renders coordination and communication on FM issues among implementing agencies more difficult, (iv) project co-financing might not follow the correct agreed proportion (16.69percent), (v) a large number of banks accounts (the DA and up to five sub-accounts) will be used, which has certain advantages but potentially renders tracing transactions more complex, (vi) Many civil works contracts widely geographically distributed which may

make it hard to monitor and trace, and (vii) accounting systems of MWI and WAJ are not capable of generating the semiannual Interim FRs following the World Bank guidelines.

132. **The proposed FM mitigation measures include**: (i) implementing the FSR is key to restoring the financial sustainability of the sector, including WAJ, MWC, and YWC, (ii) project disbursements will be centralized at WAJ, with the option of utilizing subaccounts by MWI, JVA, and the three water companies to received advances covering only six months of expenses, (iii) a full-time Financial Officer with experience in similar international agencies' operations will be recruited, (iv) anticipated AFD Co-financing will be disbursed on a pari passu basis to the DA, (v) supervision companies will be contracted to supervise the civil works, (v) most equipment will be installed in locations using installation and build contracts, (vii) the project will be financially audited on annual basis, (viii) a detailed list of assets will be maintained at each implementing agency, (ix) Semiannual Interim FRs will be generated using excel and will be submitted 45 days after the end of the semester and will be audited by the external auditor, (x) the project will be included in WAJ budget starting 2024 an onward, and (xi) A project FM manual will be developed as part of the POM. **The combined overall Fiduciary risk is "Substantial".**

133. **Environmental**. **The environmental risk is Substantial.** The activities under components 1 and 2 will be geographically spread across different governorates of Jordan. The exact geographical locations and the scale of interventions/sub-projects will be selected during implementation according to criteria set out in the project documentation and government prioritization. A variety of Project activities are anticipated, ranging from household-level to bulk water systems level and will involve many water sector implementing agencies, touching a range of water-sector systems. Those risks will be addressed by a number of instruments including sub-project ESIAs/ESMPs, ESMPs, hazardous waste management plan, asbestos management plan, etc. Further details included under Section D. Environment and Social.

134. **Social. The social risk is Moderate**. The main social risks are related to small to moderate-scale civil works across the national geographic scope of SOP-1, to be undertaken by different implementing agencies. These types of works may generate temporary community health and safety risks including road safety and traffic, noise, and dust as well as worker health and safety and labor and working conditions and also have the potential to cause socio-economic and hygiene impacts from water service disruption, especially if the works are not properly coordinated amongst municipalities and utilities. In addition, rehabilitation of household water connections has the potential to create moderate social tensions or exclusions if areas or neighborhoods are not selected in a manner not understood to be equitable and transparent. Mitigation and monitoring measures to address these risks are incorporated into the ESMF and LMP. The project also has a robust SEP for meaningful engagement and information disclosure with affected parties throughout the project cycle. Works are expected to take placewithin existing rights-of-way and sites; a RF has been prepared for any small parcels of land, if needed. The project design incorporates resourcing and capacity building for social risk management and stakeholder engagement across the implementing agencies.

135. **Other - Screening for climate change. The risk is Low.** SOP-1 will prioritize institutional and infrastructure measures that will reduce financial burden of the water sector and promote climate mitigation and adaptation. The potential risk to the water supply and wastewater infrastructure due to increased river flow, flashfloods, droughts, and earthquakes is greatly reduced by the existence of awareness within the water sector, building codes to mitigate earthquake risks and information services and plans to mitigate risks within the water sector. This Project will also support policy, capacity and infrastructure actions will be designed to support the water sector to overcome risks and adapt to climate change.

VII. RESULTS FRAMEWORK AND MONITORING

136. **The PDO is to improve the efficiency of water services in Jordan**. Improving efficiency of water services includes: (a) foundation improvement of services to beneficiaries through rehabilitated water distribution networks; (b) improving EE; and, (c) improving the drought management system.

PDO Level Indicators

137. The following are the PDO level indicators for SOP-1:

- **PDO 1: Volume of NRW reduction achieved through network replacement and rehabilitation works** - this is defined as the cubic meter per year of water saved in (i) hydraulically isolated DMAs restructured and/or rehabilitated under the project; (ii) replaced or rehabilitated main pipelines or secondary networks; and (iii) billed to customers through commercial loss reduction actions;
- **PDO 2: Beneficiaries with access to improved water services (number)**- this is defined as the number of beneficiaries from improved water service parameters that include one of the following: quantity of water, hours of service, and/or responsiveness to customer complaints;
- **PDO3: Electricity use reduced (kWh/y)–** Reduced electricity use from the grid that includes electricity savings from renewable sources through Project interventions (kWh/y reduced); and
- **PDO 4: Drought management system operationalized** (#components) – this indicator will capture operationalization of the following components of the Drought management system: (i) Drought monitor uses additional indicators and is validated in a regular basis; (ii) Seasonal forecasting information is generated on a bi-weekly and monthly basis; (iii) Drought vulnerability assessments completed; (iv) Drought preparedness and contingency plans approved by Technical/Ministerial Drought Committee.

Results Framework

COUNTRY: Jordan

Jordan Water Sector Efficiency Project

Project Development Objectives(s)

The project development objective (PDO) is to improve the efficiency of water services in Jordan

Project Development Objective Indicators

Indicator Name	PBC	Baseline	End Target
Improvement of services to beneficiaries through rehabilitated water distribution network			
Volume of NRW reduction achieved through network replacement and rehabilitation works (Cubic Meter(m3))		0.00	10,000,000.00
Beneficiaries with access to improved water services (Number)		0.00	1,600,000.00
of which female (Number)		0.00	752,000.00
Direct project refugee beneficiaries (Number)		0.00	80,000.00
of which female refugee beneficiaries (Number)		0.00	40,000.00
Direct project host community beneficiaries (Number)		0.00	480,000.00
of which female in host communities (Number)		0.00	225,000.00
Improved energy efficiency			
Electricity use reduced (GWh/y) (Number)		0.00	81.00
Improved drought management system operationalized			
Drought management system operationalized (# system component operationalized) (Number)		0.00	4.00

Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	End Target
Component 1. Sustainable non-revenue water reduction			

Indicator Name	PBC	Baseline	End Target
1.1 Water supply networks and distribution reservoirs rehabilitated or replaced as foundational work for NRW reduction (Kilometers)		0.00	1,800.00
1.2 Utility performance improvement institutionalized (Yes/No)	PBC 2	No	Yes
1.3 Modernized and systematized NRW planning and monitoring (Yes/No)	PBC 1	No	Yes
1.4 District Metered Areas where foundations for NRW reduction are established (Number)		0.00	180.00
of which DMAs with high refugee populations / host communities (Number)		0.00	75.00
1.5 Women certified as plumbers under the project interventions (Number)		0.00	550.00
of which refugee (Number)		0.00	100.00
of which reported income generation as a result of plumber certification (Number)		0.00	60.00
of which disabled (Number)		0.00	30.00
1.6 Customer feedback and willingness to pay surveys used to inform implementation of customer relationship management actions (Yes/No)	PBC 3	No	Yes
Component 2. Increased energy efficiency and reduced energy supply costs			
Net greenhouse gas (GHG) emissions (CRI, Metric tons/year)		0.00	41,796.00
Component 3. Water security measures to underpin efficiency improvements			
3.1 Drought monitor and water availability briefs (reports/bulletins) shared with relevant decision-makers on a monthly basis (reports per year) (Number)		0.00	12.00
3.2 Annual water allocation plans (intersectoral) adopted (Number)	PBC 4	0.00	3.00
3.3 Drought contingency plans developed for key sectors (Number)		0.00	2.00

Indicator Name	PBC	Baseline	End Target
3.4 Dam rehabilitation assessments completed (Number)		0.00	3.00

Monitoring & Evaluation Plan: PDO Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Volume of NRW reduction achieved through network replacement and rehabilitation works	Cubic meter per year of water saved in (i) hydraulically isolated DMAs restructured and/or rehabilitated under the project; (ii) replaced or rehabilitated networks; and (iii) billed to customers through commercial loss reduction actions	semi-annual	WC accounts and meter data	Target to be verified in year 2 of the project, after infrastructure design advanced	WC provides information to WAJ PMU and central NRW unit
Beneficiaries with access to improved water services	Beneficiaries from improved water service parameters that include one of the following: quantity of water, hours of service, and/or responsiveness to customer complaints.	semi-annually	WCs to report on location by governorate, PMU to aggregate by governorate	PMU to collect and report on information from all WCs on quantity of water, hours of service, and/or responsiveness to customer complaints, numbers to be reported separately	PMU, in coordination with the Central NRW unit, based on reports submitted by the WCs

of which female	2021 census data shows 47% of the population is female	Semi-Annually	WCs to report on location by governorate, PMU to aggregate by governorate		PMU, in coordination with the Central NRW unit, based on reports submitted by the WCs
Direct project refugee beneficiaries	UNHCR governorate level data shows that 5% of project beneficiary population are refugees	Semi-Annually	WCs to report on refugees by governorate, PMU to aggregate by governorate	WCs to report on refugees by governorate, PMU to aggregate by governorate	WCs to report on refugees by governorate, PMU to aggregate by governorate
of which female refugee beneficiaries	UNHCR data shows 50.2% of the refugee population is female	Semi-Annually	WCs to report on refugee gender by governorate, PMU to aggregate by governorate	WCs to report on refugee gender by governorate, PMU to aggregate by governorate	WCs to report on refugee gender by governorate, PMU to aggregate by governorate
Direct project host community beneficiaries	The calculation is made on the basis of 30% of the total DMAs served under the project will be under the host community population.	Semi-Annually	WCs to report on location by governorate, PMU to	WCs to report on location by governorate, PMU to aggregate by governorate	WCs to report on location by governorate, PMU to aggregate by

			aggregate by governorate		governorate
of which female in host communities	Census Data shows 47% of the host community population is female	Semi-Annually	report on gender by governorate, PMU to aggregate by governorate	report on gender by governorate, PMU to aggregate by governorate	report on gender by governorate, PMU to aggregate by governorate
Electricity use reduced (GWh/y)	Reduced electricity use from the grid, including electricity savings from renewable sources (GWh/y reduced). Indicator target setting: (i) identified EE: 40 GWh; and (ii) identified RE: 41 GWh	semi-annual	WC reporting based on electricity charges		WC reporting to WAJ
Drought management system operationalized (# system component operationalized)	Operationalization includes: i) Drought monitor uses additional indicators, regularly validated; ii) Seasonal forecasting information services improved; iii) Drought vulnerability assessments; iv) Drought preparedness and contingency plans approved;	Semi-annually	MWI consolidated reports	MWI to provide progress reports to PMD	MWI to provide progress reports to PMD

Monitoring & Evaluation Plan: Intermediate Results Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
1.1 Water supply networks and distribution reservoirs rehabilitated or replaced as foundational work for NRW reduction	Length of Pipes (km) and number of reservoirs (number) rehabilitated or replaced as foundational work for NRW reduction.	semi-annually	Verified contractor reports; Target to be set after at least 10 DMAs have been established	Length of pipes (distinguish primary, secondary or tertiary) replaced or rehabilitated during the preceding 6 months by summing-up across all contracts.	WCs to report based on verified contractor reports, PMU to aggregate
1.2 Utility performance improvement institutionalized	see PBC 2.2 for more information	see PBC 2.2 for more information	see PBC 2.2 for more information	see PBC 2.2 for more information	see PBC 2.2 for more information
1.3 Modernized and systematized NRW planning and monitoring	see PBC 1 for more information	see PBC 1 for more information	see PBC 1 for more information	see PBC 1 for more information	see PBC 1 for more information
1.4 District Metered Areas where foundations for NRW reduction are established	Number of District Metered Area (DMA) established, hydraulically isolated, with baseline established, and (i) rehabilitation designs completed and/or (ii) rehabilitation works completed	Semi-Annually	WCs to report to PMU based on verified contractor reporting	Report on all DMAs established & hydraulically isolated where design studies or works are completed, numbers reported separately: Number of designs completed, of	PMU, in coordination with the Central NRW unit, based on reports submitted by the WCs

				which number where rehabilitation works completed	
of which DMAs with high refugee populations / host communities	Number of DMAs supported with higher refugee populations/host communities (i.e., governorates with >5% refugees).	Semi-Annually	WCs to report on location by governorate, PMU to aggregate by governorate	WCs to report on location by governorate, PMU to aggregate by governorate	WCs to report on location by governorate, PMU to aggregate by governorate
1.5 Women certified as plumbers under the project interventions					
of which refugee					
of which reported income generation as a result of plumber certification	No of women who will report income generation as a result of plumber certification.	semi-annually	training records and reporting by women plumbers organizations	Under the previous cohorts about 7% of certified women have joined cooperatives through which they put their plumbing skills to commercial use. The project aims to increase the employability of females but the target (11%) reflects the realities women face when entering the job market.	MWI Demand Management Unit reporting to WAJ PMU
of which disabled					

1.6 Customer feedback and willingness to pay surveys used to inform implementation of customer relationship management actions	See PBC 3	See PBC 3	See PBC 3	See PBC 3	See PBC 3
Net greenhouse gas (GHG) emissions	Project net greenhouse gas (GHG) emissions are calculated as an annual average of the difference between project gross (absolute) emissions aggregated over the economic lifetime of the project and the emissions of a baseline (counterfactual) scenario aggregated over the same time horizon. They are reported in metric tons of carbon dioxide equivalent per year.				
3.1 Drought monitor and water availability briefs (reports/bulletins) shared with relevant decision-makers on a monthly basis (reports per year)	Number of reports/bulletins issued based on (i) drought monitor indicators and maps that reflect current and previous drought conditions at governorate level, including seasonal forecast information and (ii) current and projected water availability conditions based on water information management systems and	semi-annually	MWI consolidated reports	MWI to supply reports issued to PMD for consolidation and reporting	MWI to supply reports issued to PMD for consolidation and reporting

	decision-support dashboards				
3.2 Annual water allocation plans (intersectoral) adopted	see PBC 4 for more information	see PBC 4 for more information	see PBC 4 for more information	see PBC 4 for more information	see PBC 4 for more information
3.3 Drought contingency plans developed for key sectors	Citizen engagement indicator to capture consultations with concerned citizens to gauge their views in the development of the vulnerability mapping and the contingency plans, to improve the development process and outcomes of the drought management system.				
3.4 Dam rehabilitation assessments completed	Dam rehabilitation assessments completed following GIIP				

Performance-Based Conditions Matrix				
PBC 1	Modernized and systematized NRW planning and monitoring			
Type of PBC	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Intermediate Outcome	Yes	Yes/No	5,000,000.00	1.67
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	No			
2024	Yes		1,000,000.00	Digital systems for monitoring and reporting on NRW levels implemented, standard format report adopted, incl disaggregated losses
2025	Yes		1,000,000.00	Semi-annual report issued for monitoring NRW levels for each WC using digital systems and standard format, $166,666/WC/6mo
2026	Yes		1,000,000.00	as above
2027	Yes		1,000,000.00	as above
2028	Yes		1,000,000.00	as above

PBC 2	Improve utility performance and financial management			
Type of PBC	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Intermediate Outcome	Yes	Yes/No	22,000,000.00	7.33
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	No			
2024	Yes		750,000.00	see sub-PBCs
2025	Yes		1,500,000.00	see sub-PBCs
2026	Yes		6,750,000.00	see sub-PBCs
2027	Yes		8,500,000.00	see sub-PBCs
2028	Yes		4,500,000.00	see sub-PBCs

PBC 2.1	PBC 2.1 Utility performance improvement institutionalized			
Type of PBC	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Intermediate Outcome	Yes	Yes/No	18,400,000.00	6.13
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	No			
2024	Yes		700,000.00	Draft 100-day and 5-day Strategic Plans by each WC based on diagnostic framework at utility level, WB board approval of 100-day plan

2025	No	900,000.00	5 year strategic plans are approved by the respective Boards of Directors
2026	Yes	4,200,000.00	implementation of top actions identified in the 5 year strategic plan $700,000 per action per WC
2027	Yes	6,300,000.00	implementation of top actions, as above
2028	Yes	6,300,000.00	implementation of top actions, as above

PBC 2.2	PBC 2.2 NRW reduction fund established and capitalized			
Type of PBC	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Intermediate Outcome	No	Yes/No	3,000,000.00	1.00
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	No			
2024	No		0.00	N/A
2025	Yes		750,000.00	AJ causes WCs to increase their budgetary allocations for maintenance and sustainability for NRW
2026	Yes		750,000.00	as above

2027	Yes	750,000.00	as above
2028	Yes	750,000.00	as above

PBC 3	Customer Relationship Management Action Plans are informed by customer feedback and willingness to pay surveys			
Type of PBC	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Intermediate Outcome	Yes	Yes/No	3,600,000.00	1.00
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	No			
2024	No		0.00	N/A
2025	Yes		1,200,000.00	Preparation of Customer Relationship Management Action Plans that are informed by cCustomer feedback/willingness to pay $100K/gov
2026	Yes		1,200,000.00	At least 20% of the actions under the Customer Relationship Management Action Plan achieved, $100K/governorate
2027	Yes		1,200,000.00	At least 50% of the actions under the Customer Relationship Management Action Plan achieved, $100K/governorate
2028	Yes		0.00	N/A

PBC 4	Water allocation systems modernized, strengthening annual water allocation planning and incorporating drought contingency planning			
Type of PBC	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Intermediate Outcome	No	Yes/No	3,000,000.00	1.00
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	No			
2024	No		0.00	N/A
2025	Yes		800,000.00	Adopt improved annual Annual Water Allocation Plan ($400K/ann. plan); Inst. arrangements for drought planning $400K
2026	Yes		400,000.00	water allocation plan as above
2027	Yes		900,000.00	water allocation plan as above; pilot contingency plan prepared ($500,000/contingency plan)
2028	Yes		900,000.00	water allocation plan as above; pilot contingency plan prepared ($500,000/contingency plan)

PBC 5	Safeguarding surface water storage: Dams Risk Indexing Tool Developed, Adopted and Operationalized			
Type of PBC	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Intermediate Outcome	Yes	Yes/No	6,000,000.00	2.00
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	No			
2024	No		0.00	N/A
2025	Yes		2,500,000.00	JVA develops Dams Risk Indexing Tool, issues a Dams Risk Index Assessment using the Dams Risk Indexing Tool, Board of JVA certifies
2026	Yes		3,500,000.00	JVA budget allocated for high-priority dams actions based on the risk index assessment
2027	Yes		0.00	N/A
2028	Yes		0.00	N/A

Verification Protocol Table: Performance-Based Conditions

PBC 1	Modernized and systematized NRW planning and monitoring
Description	Semi-annual reports on NRW levels issued in the standard format which use digital systems for monitoring and reporting on NRW levels, including disaggregation of commercial and physical losses; PBC1a Digital systems for NRW monitoring and

	planning operational and standard format issued leveraging digital systems, including improved estimates of commercial and physical losses; PBC1b Systematic monitoring and reporting of NRW levels at DMA level by the three companies as per standard format issued by central NRW unit.
Data source/ Agency	The head of the central NRW Unit should consolidate the report for all WCs . A letter from the Minister MWI confirming that the requirements of the PBC have been met along with the IVA report.
Verification Entity	IVA
Procedure	(i) The central NRW entity receives the semi-annual reports from the WCs; (ii) The reports are reviewed by the IVA for conformity to the requirements of the VP; (iii) The WAJ PMD shares the achievement of the PBC to the World Bank upon endorsement of the report by the Minister.
PBC 2	Improve utility performance and financial management
Description	See respective sub-PBCs
Data source/ Agency	See respective sub-PBCs
Verification Entity	IVA
Procedure	See respective sub-PBCs.
PBC 2.1	PBC 2.1 Utility performance improvement institutionalized
Description	Utilities develop and implement performance improvement plans, focusing on achievable targets based on their capacity, available resources and financial performance. Year 1 : The Utility of Future (UoF) framework is applied at utilities and a 100 day plans and 5 year strategic plans are prepared; the 100 day strategic plan is approved by the Board of the WC for implementation. Year 2 -5 The draft 5 year strategic plans are approved by the respective Boards of Directors and WAJ, including identification of top actions for implementation under the project; Implementation of the top actions identified in the strategic plans.
Data source/ Agency	Letter or other form of endorsement from Board of Directors signifying adoption of the 100-days or 5-year Strategic Plan; verification of implementation of top actions in the Strategic Plan to be established in VP
Verification Entity	IVA

Procedure	(i) IVA verifies the report of the UoF consultant to confirm the utility assessment and the preparation of the 100 day plan and 5 year strategic plan; (ii) IVA reviews the letter/resolution from the Board of the WC on the approval of the 100 day plan of 5-year Strategic Plan
PBC 2.2	PBC 2.2 NRW reduction fund established and capitalized
Description	Establish NRW reduction fund at WAJ for utilities to undertake performance improvement activities through the financing of non-capex interventions related to NRW reduction. The type of expenditure that would be eligible for financing through the fund should meet the criteria specified in the verification protocol. Year 2 and Recurring: Annual work plan for NRW reduction in the WC is approved by WAJ with budget allocated for the activities from the NRW reduction fund.
Data source/ Agency	Letter establishing that criteria in verification protocol are met along with accompanying documentation (amended budged, work plan).
Verification Entity	IVA
Procedure	(i) WAJ shares the annual budget with the IVA and the IVA confirms a line item on NRW reduction with allocation of budget; (ii) The WAJ sends a letter signed by the SG WAJ/ Minister of water and the IVA report to the World Bank
PBC 3	Customer Relationship Management Action Plans are informed by customer feedback and willingness to pay surveys
Description	Customer feedback, service continuity, and willingness and ability to pay surveys used to inform implementation of customer relationship management actions. Detailed survey template will be used to assess willingness and ability to pay and will use customer feedback to better inform service provision improvement and opportunities, especially amongst refugees and their host community vis-à-vis service continuity improvements along with willingness and ability to pay. Detailed survey template developed, shared and agreed with WCs. Survey program implemented in certain governorates and a Customer Relationship Management Action Plan incorporating the results from the survey is approved for implementation by the Board of the WC for the corresponding governorate to improve stakeholder engagement and community outreach. Customer Relationship Action Plans incorporating the results from the survey are implemented.
Data source/ Agency	Water Company to provide information on survey, Customer Relationship Management Action Plan and implementation of relevant activities. WAJ to certify implementation of actions by governorate.
Verification Entity	IVA

Procedure	(i) The IVA to also review the Customer Relationship Management Plan as approved by the Board of WC for implementation, including feedback from customer/stakeholder engagement and surveys; (ii) The WAJ sends a letter signed by the SG WAJ/ Minister of water and the IVA report to the World Bank on the achievement of the PBC. (iii) IVA to review the survey results report for governorates prepared and submitted by the corresponding WCs to WAJ to check conformity with the Verification Protocol; (iv) The WAJ sends a letter signed by the SG WAJ/ Minister of water and the IVA report to the World Bank on the achievement of the performance-based condition.
PBC 4	Water allocation systems modernized, strengthening annual water allocation planning and incorporating drought contingency planning
Description	The water allocation plan will be developed based on annual water budget and on improved water resources information systems. The current water allocation system is largely retroactive, with a water budget prepared at the Q2 of each calendar year and allocations developed based on the water budget. The improved water allocation plan will be a water allocation plan among major sectors (municipal supply, irrigated agriculture, industry, refugee camps) which is developed by MWI with input of WAJ and JVA. The water allocation plan will be prepared based on an annual water budget prepared based on available water for the coming year at the end rainy season (end Q1 of the calendar year) utilizing information management systems for the integration, analysis, and reporting of estimates. The annual water allocation plans will be submitted to Minister's Office for adoption and use in allocation planning. This PBC will also incentivize incorporation of stakeholder feedback into contingency planning for the effective preparation of drought contingency plans for key sectors (irrigation pilot area, municipal services), including but not limited to: (i) set-up of required technical coordination arrangements, and (ii) the definition of strategies for citizen engagement and participative planning.
Data source/ Agency	Letter from Minister MWI and reports demonstrating water budget, allocation plan, technical committee constitution and contingency plan compliance with VP,
Verification Entity	IVA
Procedure	The water allocation plan will be developed based on annual water budget and on improved water resources information systems. It will include the following: water allocation plan among major sectors (municipal supply, irrigated agriculture, industry, refugee camps) which is developed by MWI with input of WAJ and JVA. For this water allocation plan, MWI on an annual basis: (i) prepares annual water budgets utilizing information management systems for the integration, analysis, and reporting of estimates; (ii) develops annual water allocation plans that define for that particular year the amount of water available for distribution among bulk water delivery points (water demand centers); and (iii) submits annual water

	allocation plans to Minister Office for adoption. The PBC disburses against: (i) approval of annual water allocation plan (scalable by year, quality standards to be specified in the verification protocol); and (ii) establishment of the technical committee for the development of contingency plans and the mechanisms for stakeholder engagement established in prioritized pilots; and (iii) number of pilot contingency plans prepared (scalable up to two pilot contingency plans). Minimum criteria for contingency plans are: definition of drought impacts and triggering criteria for drought responses and other preparation and recovery measures, reflect solicited feedback by concerned citizens on consulted aspects of the plans and envisaged response measures including on types of water sources for use, alternative crop practices (or as the case may be), including cross-stakeholder communication and coordination mechanisms, and other provisions for periodic updating of plans, and use of drought monitoring information.. IVA to review the water budget records, water allocation plans, drought contingency plans and progress reports prepared and submitted by MWI and check conformity with the verification requirements.
PBC 5	Safeguarding surface water storage: Dams Risk Indexing Tool Developed, Adopted and Operationalized
Description	"Risk indexing tool" characterizes dam safety risks in a systematic, qualitative, and relatively manner to help evaluate and prioritize safety issues for individual dams and the portfolio of dams. These potential risks are quantified as deficiencies in the current physical state or condition of the dam and are weighted by their overall importance to the safety of the dam and the vulnerability and downstream hazard / consequence potential of the dam. "Dams Risk index assessment" utilizes the Risk Indexing Tool to identify and prioritize dam safety measures and remedial actions, identify knowledge gaps (for example, dam records, hydrological data, instrumentation adequacy, among others) and to evaluate the effects of risk reduction and dam safety enhancement measures on the overall risk profile.
Data source/ Agency	JVA to provide TOR, Dams Risk Indexing Tool and Risk Indexing Assessment to IVA; Minister of Water to certify Risk Indexing Assessment and Prioritization of Dams investments
Verification Entity	IVA
Procedure	Refer to VP

ANNEX 1: Implementation Support Plan

Table A.1 Focus of Implementation Support

Time	Focus	Skills needed	Resource estimates
First 12 months	Implementing the SOP-1; enhancing budgetary processes; strengthening the M&E system.	Financial, procurement, operations, environmental, social, water supply, water resources management, M&E; technical specialists.	Three support missions 3 x 9 people x 1.5 weeks = 40 weeks over 12 months
Year 2-5	Reviewing implementation progress; cross-checking linkages between planning, budgeting, and results; providing for PBC and its verification.	Legal, financial procurement, operations, environmental, social, M&E; technical (as required).	Two support missions 2 x 10 people x 2 weeks = 80 weeks Total 80 weeks over 48months

Skills needed	Number of Staff weeks	Number of trips
Task team management	30	11
Water Supply Specialist	22	11
Water Resource Specialist	14	7
Non-Revenue Water Specialist	14	7
Energy Efficiency specialist	14	7
Drought Specialist	14	7
FM and Procurement	12	6
Environment specialist	12	6
Social Safeguards specialist	12	6
M&E specialist	14	7

Figure A1.1. Implementation Arrangements

ANNEX 2: Economic and Financial Analysis

1. **Economic Analysis.** The economic analysis compares estimated economic benefits of the Project with its economic costs. Net benefits and costs were estimated over the period 2023-2042. The cost-benefit approach was used to evaluate the benefits of the Project and the analysis is based on the following main assumptions: [46]

- The economic discount rate or social opportunity cost of capital of 6 percent.[47]
- Water and Wastewater tariff reform between 2024 and2029, as per the FSR.
- The operating cash deficit of WAJ will continue to increase under "without Project" scenario.
- The shadow price of carbon was included in the economic analysis consistent with the Projection in the World Bank's Guidance Note on Shadow Price of Carbon in Economic Analysis (2017).
- Costs and benefits are expressed in constant prices as of 2022 and are exclusive of taxes.

2. **Conceptual approach.** The economic benefits were evaluated by comparing "with Project" and "without Project" scenarios and their impacts on the revenues and costs of water supply in the country.

3. **Economic costs.** The main economic costs include: (a) capital expenditures related to reductions in physical and commercial water losses; (b) capital expenditures related to improving EE and reducing, if applicable, energy load during peak hours; and (c) incremental operational expenditures to maintain reductions in NRW.

4. **Economic benefits.** The main economic benefits include: (a) increased water revenues as a result of NRW reductions; (b) decreased operational costs due to energy savings and feasible energy load reductions during peak hours; (c) avoided GHG emissions as a result of increase renewables and EE gains; and (d) increased consumer surplus through a reduced reliance on water tankers.

5. **Conceptual approach to evaluation of economic benefits.**

(a) **Increased water revenues as a result of NRW reductions.** NRW is currently above 50 percent in Jordan, severely impacting revenues for WAJ. As a result of the Project, overall NRW is expected to be reduced by 10,000,000 m^3 through the reduction of physical and commercial losses resulting primarily in increased water revenues.

(b) **Decreased operational costs due to energy savings and energy load reductions during peak hours.** The water sector is the single-largest energy consumer in Jordan – with the sector having consumed 1730 GW in 2021 costing the sector more than US$ 250 million. Electricity represents over half of the water companies operating costs, due to both the energy intensity of their systems and the high cost of electricity. The project will improve EE of the water sector by reducing energy used by 81 GWh/year through efficiency improvements, scaling-up RE, and enabling energy load shifting.

(c) **Reduced GHG emissions as a result of increase renewables and EE gains.** Increased EE and reduced energy supply costs are expected to significantly reduce GHG emissions. Energy savings of 81 GWh/yr that are included under SOP-1 support leading to GHG emission reductions of 41,796 tCO_2 equiv. per year.

(d) **Increased consumer surplus through a reduced reliance on water tankers.** Reducing physical losses is expected to increase service continuity, especially in the regions with lowest levels of service. As a result, those regions will reduce their dependence on private and informal water sources which are more expensive.

[46] The cost-benefit analysis is a method for comparing the economic pros and cons of policies and programs to help policymakers identify the best or most valuable options to pursue. Cost-benefit analysis monetizes all major benefits and all costs associated with a project so that they can be directly compared with each other as well as to reasonable alternatives to the proposed project. A cost-benefit analysis is generally considered the most comprehensive approach and, in many ways, the gold standard. World Bank, Investment Project Financing Economic Analysis Guidance Note, 2014.

[47] Estimated as two times the real per capital long-term GDP growth consistent with the World Bank Guidance on Discounting Costs and Benefits in Economic Analysis of World Bank Projects (May 9, 2016).

Owing to the reduced reliance on bottled water and water tanker trucks, residents will benefit from financial savings as they replace those sources with water from their cheaper piped connection.

6. **Results:** The economic analysis yielded an economic NPV of US$125 million and ERR of 13.6 percent exclusive of the shadow price of carbon and an economic NPV of US$165 million and ERR of 15.7 percent inclusive of the shadow price of carbon.

GHG Emissions Mitigation

7. **A GHG analysis was carried out on the Project's increased EE and NRW improvements**. The increased EE actions and reduction of NRW will lead to energy savings of about 81 GWh/yr. Electric power generation in Jordan relies predominantly on fossil fuels with significant impact on the environment. The percentage of oil, coal, natural gas, and oil shale in the energy mix for 2019 was 89 percent with 11 percent RE resulting in an emissions factor of 0.516 tCO_2/MWh. Reductions in GHG emissions of 41,796 tCO_2 equiv. per year, or 697,993 tCO_2 equiv. over the economic life of the Project, are expected under the Project. The NPV of the Project includes US$19.8M-US$39.7M from GHG emissions avoided using the recommended high and low values for the shadow price of carbon.

Financial Analysis

8. **Financial analysis.** The financial analysis compares estimated financial benefits of the Project with its financial costs. Net benefits and costs were estimated over the period 2023-2042. The cost-benefit approach was used to evaluate the benefits of the Project and the analysis retains the key assumptions from the economic analysis adding a key assumption that financial Costs and benefits exclude non-cash generating benefits (consumer surplus, GHG emissions).[48]

9. **Conceptual approach to financial analysis**. The financial impact of project activities is assessed by the FIRR derived from the economic cost benefit analysis to conclude whether the project is financially sustainable. In order for the project to be financially sustainable revenues and cost savings must exceed capital expenditures and operations and maintenance costs.

10. **Results:** The financial analysis yields an NPV of US$70.5 million and FIRR of 10.3 percent implying that the project is financially sustainable. Water revenues are expected to increase by US$377 million over the life of the project while energy costs, the largest operating cost for the water sector, is expected to be reduced by US$183 million over the life of the project. The increase in revenues and decrease in operating costs are expected to exceed capital expenditures and additional O&M of the project by 2033.

11. The financial viability of the project relies on the financial viability of WAJ. The financial performance of WAJ is measured through improvements in O&M cost recovery, and WAJ's accumulated deficit. In order to evaluate the projected financial performance of WAJ, a financial analysis of WAJ was undertaken which includes the following assumptions of the base case:

- The AAC is commissioned in 2028
- Existing commercial debt continues to be rolled over
- Disorderly debt accumulation through arrears will be eliminated
- The cost of capital for new projects will be reduced from 8.1 to 5 percent by pursuing grant, concessional finance and guarantees
- The OPEX costs of operating the AAC will be reduced by guaranteeing a supply of electricity at 57 fils/kWh
- Water and Wastewater tariff reform between 2024 and 2029, as outlined in the FSR

[48] The cost-benefit analysis is a method for comparing the economic pros and cons of policies and programs to help policymakers identify the best or most valuable options to pursue. Cost-benefit analysis monetizes all major benefits and all costs associated with a project so that they can be directly compared with each other as well as to reasonable alternatives to the proposed project. A cost-benefit analysis is generally considered the most comprehensive approach and, in many ways, the gold standard. World Bank, Investment Project Financing Economic Analysis Guidance Note, 2014.

- Lease costs associated with the As Samra, Disi and AAC PPPs will be covered from general taxation.

12. **Under the base case scenario, the financial performance of WAJ is expected to continue to deteriorate.** As of 2021, the operating cost recovery ratio of WAJ is 78 percent and is expected to decline below 65 percent by 2028 without intervention. The annual deficit of WAJ in 2021 was US$277 million and accumulated deficits have reached US$ 3.8 billion as of 2021. Without intervention, annual and accumulated deficits are expected to worsen with the planned 300 MCM AAC expected to result in a large increase in WAJ's capital and operating expenses. While the final costs of the AAC are not yet known but modelling suggests capital expenses to be at least US$3 billion. The AAC is expected to require 300 MW of installed electricity generation capacity, even with a reduced rate of 57 fils/kWh these additional costs will create a significant financial constraint for WAJ. Without action, t**he annual operating cash deficit will accumulate to $US 15 billion of sector debt by 2040.** The combination of existing operating losses and the increasing Capital Expenditures and O&M costs associated with the AAC will lead to an annual operating cash deficit of about $US 113 million to $US 282 million while annual total deficits will be approximately $US 423 million.

13. Projections of the financial performance of WAJ with the project were made on assumptions that:
    - NRW is reduced by a total of 10,000,000 m^3 by 2040
    - EE projects will materially reduce operating costs
    - All other assumptions of the base case scenario remain identical

14. **Under the "with Project" scenario, WAJ's financial performance is expected to improve prior to the AAC.** The increase in revenues through NRW reductions and lowered operating costs will improve the operating cost recovery ratio to 85 percent prior to the AAC coming online. Compared to the business-as-usual scenario, WAJ's annual deficits will decrease significantly, resulting in WAJ's accumulated will be lowered by US$ 686 million in 2040.

ANNEX 3: Supplemental Technical Information

1. This Annex contains additional, supplemental information in Compliment to the main PAD section on Component Description, where warranted.

2. **Supplemental Information for Component 1. Sustainable Non-Revenue Water Reduction ($212 million).** This component will support the efficiency improvement by reducing losses of the available water resources (financial and commercial) and overall improvement in operational systems in the water sector. Despite the potential benefits, reducing NRW is not easy to implement, particularly under the conditions prevalent in the Jordanian water sector: limited operational budget and limited water availability allow for only intermittent supply, which explains why the Jordanian find it impossible to effectively address this problem. To reduce NRW under conditions of intermittent supply, alternative operational and technical approaches have to be adopted, and effective arrangements in the managerial and institutional environment need to be mobilized. Intermittent supply conditions – common throughout Jordan, with the exception of Aqaba - result in constant cycling between no pressure and over-pressure in pipes, which increases pipe bursts and physical leakage. The network is fully pressurized in a specific area and for only a few hours in a week restricting the time available for detecting leaks. The Water Companies' budgetary limitations hinder routine maintenance works required to maintain a functioning network and impede their ability to mobilize within the service area to fix leaks and pipe bursts.

3. In addition, the bulk water supply network is not metered, and household meters are not reliable in many locations, resulting in the WC's and WAJ's inability to reliably track water delivery and water losses. A proper understanding of the baseline situation is a critical first step in moving towards an effective reduction program (Djalia, 2020; Kingdom et al., 2006). Lack of understanding of the volume, sources, and cost of NRW is one of the main reasons for insufficient NRW reduction efforts around the world. Only with appropriate metering and FM systems is it possible to properly understand the water delivery and water billed, and to take the required action to address commercial and physical losses. USAID is supporting installation of bulk meters throughout Jordan and NRW support from the SOP and from the other development partners will prioritize meter replacement and household connections in their respective areas of focus. These efforts will support WCs and WAJ to more accurately identify the quantity of losses, to attribute commercial or physical losses, to design the appropriate measures to address the NRW, and subsequently to monitor and sustain low NRW levels.

4. Jordan is developing the necessary range of skilled personnel, trained, and focused on addressing NRW. In order to sustainably reduce NRW, the impetus to address losses must be the job of water professionals across the organizational structure, from professional managers and engineers at one end of the spectrum right through to street crews, technicians, and plumbers at the other. "NRW reduction," in its broadest sense is not taught in universities or technical colleges, nor in many water industry training institutions around the world. As a result, employees with the necessary skills are not widely available. Addressing this issue will require accepting the widespread challenges and consequences associated with NRW and then developing appropriate training materials, methods, and institutions. A major initiative is required to build this capacity (Djalia, 2020; Kingdom et al., 2006). Jordan's efforts to build capacity include assigning NRW units and Focal Points within the Water Companies, establishing the central NRW unit that reports to the Minister of Water and Irrigation and focusing significant investment and support on establishing and scaling up good practice in the sector.

5. Most of the above challenges can be applied to both private and public facilities, but, in general, private operators have incentives to reduce NRW as this can generate more revenue and reduce operating costs, as well as set contractual targets in many cases. However, it is more challenging for publicly managed utilities because they often lack an appropriate enabling environment and adequate incentive framework for performance. However, that appropriate incentives can be placed in a public utility within a broader framework to encourage independence, accountability, and market and customer orientation. For these reasons, performance-based service contracting, where performance is

improved against defined contractual objectives, may provide an enabling environment and incentives to reduce NRW, with immediate operational and financial benefits.

6. The SOP will build on these experiences and lessons, to strengthen the approach to NRW reduction in Jordan and in other developing countries, through these primary measures:

- Embed NRW capacity in the Ministry, WAJ and the Water Companies
- Leverage significant existing support to GOJ from other development partners for improved NRW information services including bulk water metering, SCADA systems
- Strengthen the approach to private sector involvement through preparatory studies for designing NRW reduction projects
- Mobilize an operational fund to maintain NRW reduction

7. Pre-identified rehabilitation and foundational efforts for NRW reduction are shown in Table A3.2. Given that the planning process is underway, SOP-1 followed a framework approach to appraisal, and this list of investment actions will be narrowed during implementation according to framework criteria. Categories of investment and criteria for investment support will be agreed during preparation and specific investments will be cleared through the Annual Work Planning process according to the framework criteria. The client will provide a preliminary list of prioritized sub-projects on the basis of: (i) the NRW Strategy and Actions Plans; (ii) known priority NRW actions by governorates relying on WC operational experience and recent planning efforts; and (iii) exclusion from the SOP based on a list of on-going support provided by other development partners. The Appraisal of SOP-1 was based on this preliminary identification and after the Master Plan is completed, the World Bank team and MWI will confirm the prioritization of projects and investments.

Table A3.2. Pre-identified Near-term Rehabilitation Investment Needs by Governorate (Investments to be confirmed during implementation)

Water Company	Governorate	Number of projects	Cost Estimate for Works in JD	Cost Estimate for services in JD	Estimated Total Cost in JD
YWC	Irbid	10	44,400,000	4,400,000	53,328,000
YWC	Ajloun	2	2,175,000	217,500	2,392,500
YWC	Jerash	5	10,860,000	1,086,000	11,946,000
YWC	Mafraq	4	22,950,000	2,295,000	25,245,000
Total Project Cost YWC		**11**	**80,385,000**	**8,038,500**	**88,423,500**
Miyahuna	Balqa	6	15,000,000	1,500,000	16,500,000
Miyahuna	Madaba	3	9,000,000	500,000	9,500,000
Miyahuna	Zarqa	5	15,000,000	1,500,000	16,500,000
Miyahuna	Amman	1	9,000,000	100,000	9,100,000
Total Project Cost Miyahuna		**15**	**48,000,000**	**3,600,000**	**51,600,000**
Aqaba	Aqaba	23	40,030,000		40,030,000
Aqaba	Karak	4	8,400,000		8,400,000
Aqaba	Ma'an	5	12,150,000		9,150,000
Aqaba	Tafileh	2	3,150,000		3,150,000
Aqaba	Aqaba, Karak, Ma'an	Multiple (designs)		600,000	600,000
Aqaba	Aqaba, Karak, Ma'an	Training		50,000	50,000
Total Projects Cost at Aqaba		**32**	**63,730,000**	**650,000**	**64,380,000**
Total		**58**	**192,115,000**	**12,288,500**	**204,403,500**

8. **Framework selection criteria:** The framework selection criteria for sub-projects will be confirmed for alignment with the Capital Investment Master Plan expected to be finalized by July 2023. The component will support activities and investments that lay the foundation for or contribute directly to reducing the NRW in selected geographical areas and sustaining it at reasonable levels. For any sub-project to be considered, it should meet the following criteria:

   (a) Alignment with the Capital Investment Master Plan
   (b) Demonstrated linkage of the activity/investment with lowering or sustaining NRW levels. The component will cover activities linked to both commercial losses and technical/physical losses. Commercial loss reduction activities will include, but not limited to (i) installation of bulk and customer level meters; (ii) customer surveys: (iii) updating/implementing a billing and collection system; (iv) decentralized customer management system (at zonal level); (v) and other activities that contribute to commercial loss reduction. Technical loss reduction will include, but not limited to (i) developing new or updating existing hydraulic modelling; (ii) establishing and operationalizing hydraulically isolated DMAs, both new or existing; (iii) restructuring/rehabilitation of water supply networks; (iv) re-laying household connections; (iv) investment in equipment for managing pressure; (vi) systematic identification and repair of leaks (v) building additional in-network storage reservoirs; (vi) rehabilitation/replacement of bulk transmission network.
   (c) Informed cost-benefit ratio
   (d) At least 30 percent of areas (DMAs) supported under the project will have a significant refugee and host community population (i.e., > 5 percent refugee in governorate).
   (e) The project will exclude the following categories of investments, unless otherwise agreed with the World Bank:
      i. Construction of new or rehabilitation of existing water treatment plants and wastewater treatment plants
      ii. Expansion of existing groundwater wells or digging new groundwater wells
      iii. New transmission network for inter-city water transfers (rehabilitation/replacement of a part of an existing network is not excluded)

9. **Supplemental Information for Sub-component 3.1. Strengthening water allocation and drought management systems ($9 million).** This sub-component is underpinned by the principles for a proactive and integrated approach to drought management that is based in three main pillars: preparedness, response, and mitigation. The GOJ through the 2018 Water Sector Policy for Drought adopted these principles and set forth the priority objectives and the institutional framework for a drought management system, after which the Drought Management Unit was established under the MWI.[30] These efforts also led to the development of a National Drought Action Plan (DAP) in 2019 under which priority actions for preparedness, response (e.g., alert, emergency, and crisis) and mitigation to reduce drought risks are proposed. The Unit has undertaken efforts to advance the development of a drought early warning system, which constitutes one the first actions of the Drought Policy and the DAP. A remote sensing-based drought monitoring system is in place, which is needs further development and is yet to become operational. The information products that are currently generated (*i.e.*, monthly drought severity maps) are not yet validated and disseminated with relevant actors and stakeholders, and the integration of drought vulnerability, forecast, intra and cross-sector information is still needed to effectively support inform decision-making and actions based on potential drought risks. Further, drought contingency plans that outline specific response and mitigation measures for any specific sector or system are yet to be developed.

10. The strengthening of the drought management system for monitoring, forecasting and planning, includes the improvement of the existing drought monitoring system through (i) a diagnostic assessment to enable data generation and sharing for drought risks management, (ii) the upgrade / development of indicators used to monitor droughts (*i.e.,* sector specific indicators), (iii) the development of associated mechanisms for the generation, validation, and dissemination of monthly maps and other related information products to users and decision-makers, (iii) the

development and integration into the drought monitor of seasonal forecasting information, (iv) capacity building and training of relevant staff. This will also include the development of drought vulnerability and impact assessments following participatory approaches as the case may be to complement survey information, and with a strong focus on vulnerable groups and gender to complement the monitoring of (physical) drought hazards to effectively manage drought risks. Improvement of the drought management system will also target the preparation and adoption of drought preparedness and contingency plans that will outline mitigation and response actions based on the different levels of drought intensity for the hydro system and irrigation system in pilot area. This activity will follow the strategic orientations and actions already outlined in the DAP and will incorporate a strategic dimension and involvement of different actors with greater focus on the operationalization and implementation of the plans.

11. This sub-component further aims to strengthen information management systems, which are needed to underpin drought management systems and decision-making on water allocation planning under normal and extreme climate conditions. Water information management systems in Jordan currently consist of historical and real-time water data repertoires with limited interoperability capability among available platforms within MWI and across with JVA and WAJ. These systems lack or have limited platforms that enable automated data processing and analysis, visualization, decision-support, and dissemination functions. There are also inefficiencies with respect to the timeliness and completeness in cross-sector data sharing (i.e., water use and demands from WAJ and JVA) and its integration in one comprehensive information framework to support strategic and operational decision-making for water resources planning, management and other uses in normal conditions and extreme water conditions. The drought monitor will benefit from enhancements in the operability of the water information system through the enhanced access to water sector data and modeling tools supporting the generation and regular reporting of specific drought impacts in the sector.

12. The strengthening and improvements to water information management system under the SOP-1 will specifically encompass: (i) the development and adoption of cross-sector data sharing protocols (between MWI and JMD); (ii) development of data management systems for the existing water information platforms to enable data exchange and interoperability, processing and integration, storage, visualization, and access (including associated ICT equipment, software, hardware, and physical infrastructure—refurbishment and expansion of data centers/offices); (iii) the development of technical capacity and analysis systems to perform hydrological modeling and seasonal forecasting (including the development and coupling of a hydrologic model and seasonal forecasting information into the existing water evaluation and planning model tool for operational use in water allocation planning); and (iv) the development of technical capacity and tools for the generation of bulletins and reports on a frequent basis informing on water availability levels and disseminated to decision-makers (MWI, WAJ, JVA), including user-based applications or other reaching end-users (e.g., farmers).

13. This subcomponent will also use PBCs to incentive the institutional actions necessary to improve water allocation planning and to establish the institutional coordination and mechanism to ensure citizen engagement for the preparation of drought contingency plans in pilot areas. The water allocation plans will be elaborated based on the improved information management systems that will enable the integration of water information and the operationalization of tools to derive water balances annually, to inform water distribution plans based on water availability and water allocation principles. Currently, water balances to support decision-making are elaborated using semi-manual techniques with simple table reporting outputs. Water distribution planning that for instance considers different scenarios depending on water allocation volumes, that further depict forecast information and specific thresholds could be utilized to improve allocation planning. Moreover, decision-making on water allocation distribution is often done ad-hoc and without a consistent systematization of dissemination mechanisms of water allocation information and plans among decision-makers for endorsement and subsequent action. PBCs will also incentive the establishment of institutional coordination mechanisms required within MWI and respective sector actors to ensure effective design and development of drought contingency plans, including the necessary platforms and systems in place to ensure and facilitate stakeholder consultations among concerned actors during the preparation of these plans.

ANNEX 4: Refugees in Jordan

1. **From 2011 to 2015, an estimated 1.3 million refugees fled to Jordan from the conflict in Syria, equivalent to 17 percent of Jordan's 2011 population severely straining basic services delivery, including water and sanitation.** The influx of refugees made Jordan the country with the largest population of Syrian refugees as a share of the total population, adding to the more than 2 million Palestinian refugees already living in Jordan. The conflict added significant pressure to public finances, by 2017 the estimated cumulative impact of the conflict on Jordan's GDP was about 18 percent of GDP.[49] Over 85 percent of Syrians live outside refugee camps, similar to the percentage of Palestinian refugees living outside of refugee camps, the majority of Syrian refugees live around Amman and the North-East of Jordan (Table A4.1), with the largest number living in Amman (26.4 percent), Irbid (17.9 percent) Mafraq (11.5 percent), Zarqa (6.2 percent), and Balqa (2.3 percent). The influx of Syrian refugees has placed tremendous pressures on public services and infrastructure, in particular electricity and water services throughout the country, but especially in the northern governorates where refugees from Syria have taken up residence in host communities. The water sector strained to keep pace with the 32 percent increase in domestic water use from 2011 to 2015 (Figure A4.2) as electricity costs rose from 43 Fils/kWh in 2010 to a peak of 140 Fils/kWh in 2018. The increase in demand, coupled with high levels of NRW has resulted in annual deficits by the water sector and an accumulation of debt hampering the ability to invest as domestic water use continues to increase. Investments in efficiency (NRW reduction and EE) under components 1 and 2 of SOP-1 will alleviate financial pressures to the water sector allowing WAJ to provide better service to refugees and their host communities.

2. **With high levels of NRW and poor service continuity, especially in rural areas, refugees often rely on tanker trucks and bottled water to meet their water needs.** Over 26 percent of refugees living out of camp report having insufficient household water storage to cover all family needs (hygiene, cooking, cleaning).[50] In addition, 12.6 percent of Syrian refugees report their main water source as water trucks and tankers. Component 1 of SOP-1 will bring needed investments aimed at improving the efficiency of water supply services, directly benefiting refugees and their host communities by providing better and more consistent access to water, reducing the need to purchase bottled water and from tanker trucks. In Amman where the bulk of refugees reside 10 percent of Syrian refugees report water trucks and tankers as their main water source, sub-component 1.2 targets out-of-camp Syrian refugees and their host communities by prioritizing NRW reduction work in districts with high concentrations of Syrian refugees. Reliance on water trucks and tankers is highest in rural areas like Mafraq (34 percent of Syrian refugees reporting water trucks and tankers as their main water source). Refugees in areas with very poor service continuity (Ajloun and Jerash receive water once every 2 weeks) report paying more per month on bottled water compared to their water bill (piped connection), and 40 percent of refugees in Jerash, Ajloun, and Amman report they have insufficient household water storage to cover all family needs. Sub-component 1.2 will support rehabilitation activities aimed at reducing NRW in Balqa, Irbid, Jerash, Ajloun, Mafraq, Aqaba, Karak, and Tafileh where service continuity is low, and refugees and their host communities are relying on bottled water and water trucks the most.

3. Most Syrian refugees in Jordan came from southern Syria where agriculture is the main economic sector, leading to high levels of employment of Syrian refugees in Jordan's agriculture sector. Syrian refugees were not allowed to work legally before 2016. Since then, work permit take-up has been slower than expected, driven by the perception that permits would be expensive and would tie a worker to a single employer. From 2016-2021 Syrian refugees most commonly held work permits in Agriculture (37 percent), Construction (23 percent), and Manufacturing (12 percent). Refugees working in agriculture are often employed informally or seasonally, making their employment vulnerable

[49] IMF 2017

[50] Samuel Hall, UNHCR Jordan 2022. Vulnerability Assessment Framework: Population Survey for Refugees in Host Communities.

particularly when agriculture must be scaled back due to drought related shocks. Component 3 will help improve information regarding water availability and allocations during drought situations, thus reducing the impacts of drought shocks on the agricultural sector and refugee employment. Additionally, SOP-1 will partner with the WPI to support women, including refugees, in receiving vocational training and acquisition of a plumber certification, which provides access to employment opportunities that focus on household needs.

4. **Investments in efficiency, and drought management under SOP-1 will directly benefit Syrian refugees and their host communities by improving the reliability of the piped water network and improving drought risk management in agriculture.** NRW and the lack of consistent water supply creates a drain on household resources as refugees are dependent on water trucking to access water which is more than double the cost of piped water services. NRW reductions achieved through component 1 will increase water availability and service continuity translating to more water in the piped network for more hours of the week. Refugees and their host communities who lack household water storage to meet their basic family needs will have more access to piped water, filling what household water storage they have, and will reduce their reliance on bottled water and water trucks. Syrian refugees face important labor market barriers even with a work permit, since many sectors have quotas or are closed to non-Jordanians. Given Jordan's extreme water scarcity and frequent and intense droughts, employment in agriculture for Syrian refugees can be precarious. Improved risk management, and drought planning at a national level achieved through component 3 will help decision making at the farm level, allowing Jordanian farmers to better signal to the labor market. In turn, being consulted in drought vulnerability assessments and providing labor to better informed farmers will benefit Syrian refugees affected by drought directly or through their employment in the sector.

ANNEX 5: Rationale for a Series of Projects and Investment Project Phasing

1. **The proposed SOP provides the investment support and long-term approach needed to support implementation of the Water Sector FSR to improve the efficiency and resilience of the water sector.** Through the SOP, multiple projects financed by the World Bank contribute to the Government's objectives to improve efficiency, service delivery and financial sustainability of the water sector. The SOP is expected to be implemented between 2023 and 2032, through three proposed investments which will be staggered by approximately 2 years, allowing for preparatory works and institutional reforms envisioned under the FSR to be carried out during implementation periods of the earlier phases. The World Bank team will coordinate closely with the United States, Germany, France, and other partners; it is anticipated that AFD will co-finance the SOP and the World Bank will seek to mobilize co-financing for the SOP.

2. **Mobilizing efficiency investments through a long-term, programmatic approach will provide investment continuity needed for major investment in infrastructure and institutional reform, linking planning with action.** The SOP approach will provide flexibility to adapt design over time as circumstances evolve and from improved financial planning as investment costs are better aligned with advanced and detailed studies. Design and implementation of infrastructure investments concurrent with innovative information services, particularly updated bulk water systems that support improved distribution water between municipalities and other uses, will be phased and timed within the SOP. Leveraging the SOP tool also provides the flexibility of committing the full envelope of financing required after investments readiness is advanced and institutional reform measures required for financial sustainability are initiated.

3. **For all areas identified in the FSR, a long-term programmatic approach is needed given the inherent timeline for implementation and measures needed to ensure sustainability and the limited investment readiness in the sector**. Currently, planning for loss reduction varies throughout the country. In Amman, portions of the network are zoned and isolated with investments prepared to feasibility level by USAID, however, given the stop-start nature of the work to date and the challenges Miyahuna experiences with limited bulk water availability, these zones are often overridden, and investments are slow to advance. For the majority of Amman and the country, physical loss reduction actions are identified at a strategic level, and further work is needed to establish the baseline, isolate portions of the network, and foundational rehabilitation efforts are needed given aging infrastructure – all before concerted loss reduction efforts through pressure management and leakage detection can be mobilized. NRW Action Plans developed for all governorates, and supported by USAID, identify near-term commercial loss reduction actions, in all governates, and while useful in mobilizing quick wins, these plans will need to be bolstered and expanded to sustainably achieve loss reduction results. GIZ studies identified EE actions for all Water Companies and design work is needed to deliver EE results, although these efforts can be mobilized near-term. However, peak load shifting will require study, planning and policy dialogue before focusing on investment and results. Likewise, rehabilitation needs to protect and improve use of grey water in the Lower-Jordan Valley irrigation systems require study prior to investment and drought management efforts require careful sequencing of policy and investment measures over time.

4. **SOP Objective**: to improve efficiency, service delivery and financial sustainability of the water sector. The SOP will operationalize the FSR approved by Cabinet of Ministers in November 2022. The SOP is also aligned with, and will contribute to, the new Vision for Economic Modernization, Government's National Strategy for the Water Sector and Non-Revenue Water Reduction and Energy Efficiency Strategies.

5. **The proposed SOP will invest in the following areas:**

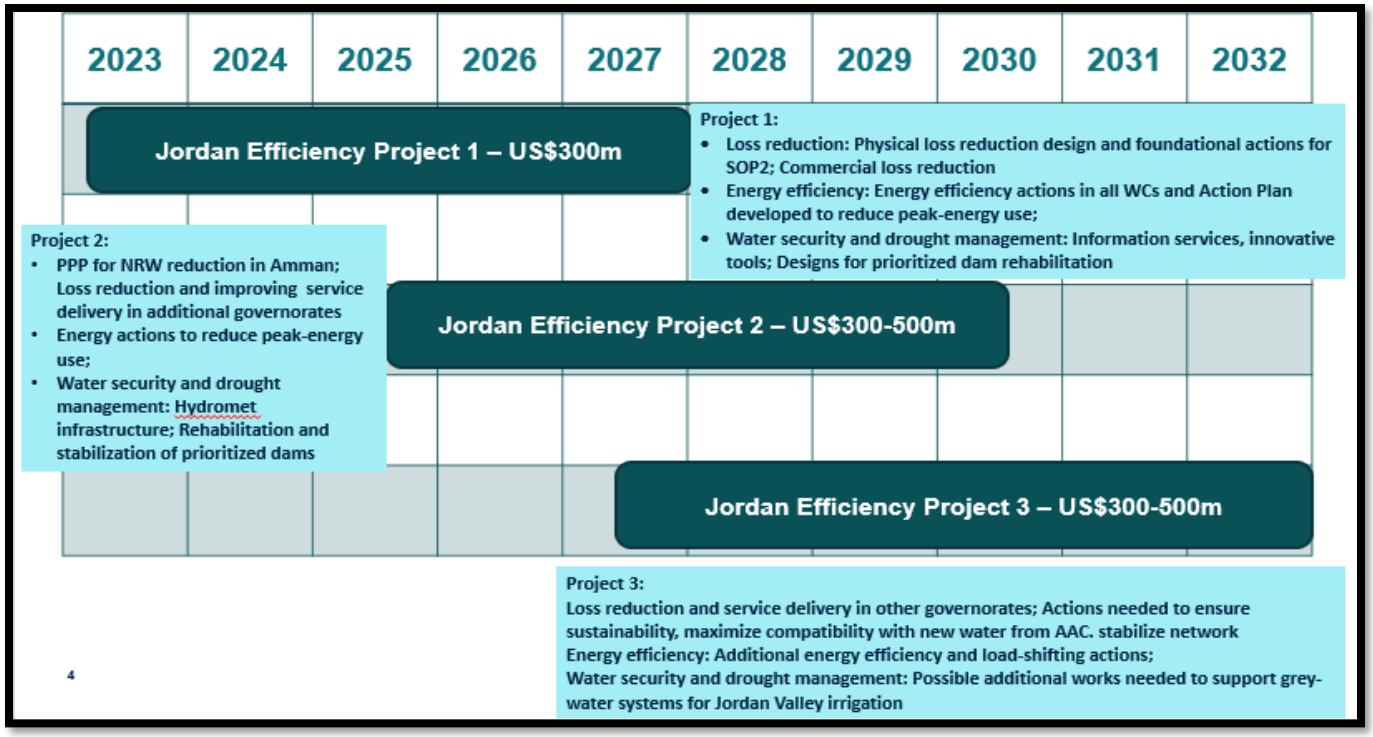
   (a) **Loss reduction and service delivery**: infrastructure and institutional actions that reduce commercial and physical losses in bulk and primary systems and improve service delivery including distribution network rehabilitation and stabilization, upgrading to smart-utility systems and smart meters and commercial loss reduction actions. Actions in later stages of the SOP (i.e., SOP-2 and 3) could include bulk water conveyance systems and reservoirs to improve long-term water security and service delivery, including to prepare for and leverage the AAC as it comes online;

(b) **EE and cost reduction**: infrastructure and institutional actions that improve EE of the current network and that improve feasible energy load management and utilization of time-of-day electricity pricing, including terminal reservoirs and pumping systems;

(c) **Water security and drought management**: strengthen water management systems and infrastructure, including grey-water systems, dam safety, water allocation tools and drought management systems

Anticipated actions within each focus area for each phase of the SOP are shown in Figure A5.1.

Figure A5.1. Anticipated phasing, focus areas and timing of the SOP



ANNEX 6: Executive Summary of the FSR

1. **Over the past decade a series of external shocks and sector developments have increased the costs of water services and depressed revenues.** The external shocks include a sharp rise in the cost of energy following the severing of Egyptian gas supplies in 2011, the influx of refugees from Syria, and, most recently the COVID-19 pandemic. Over this same period two PPPs providing essential services came on-line changing the cost structure of the sector. These PPPs include: i) the Disi Pipeline that pumps 100 MCM of water a year to Amman and other cities, and ii) the As Samra plant that provides essential wastewater treatment services for the Greater Amman area and 133 MCM of TWW for agricultural irrigation.

2. **Together these external shocks and sector developments pitched the WAJ into structural financial deficit.** Since 2012 these deficits have added to WAJ debt which at the end of 2019, just before the COVID-19 pandemic, stood at JD 2.5 billion (equivalent to 7 percent of GDP). During the COVID-19 pandemic costs rose as more water was pumped to support hygiene measures and revenues fell as water meter reading and bill collection was postponed for a period of 3 months. The full effects of this rise in costs and fall in revenues will be revealed in the 2021 WAJ audited financial statements.

3. **The aim of the FSR has been to build a consensus on the best way to restore financial sustainability to the water sector.** The development of the FSR was a multistakeholder dialogue process with different groups of stakeholders leading the process during the first and second phases. During the first phase of the FSR's development, working groups were set up under the joint leadership of MWI, GIZ and the World Bank. The WGs assembled available data on the sector, drew lessons from past interventions and proposed future options for improving sector-wide efficiency. In a second phase of the FSR, the MOPIC led a cross-government, multi-sectoral discussion to resolve core economic policy trade-offs required to define the FSR. The output of this second phase in June 2022 was a revised version of the FSR's underlying financing model that reflects GOJ policy positions, some already supported by Cabinet decisions, that underpin the approach to restoring the water sector to financial sustainability.

4. **The emerging Consensus Policy Scenario presented in the FSR reflects a series of policy positions aimed at restoring financial sustainability to the water sector by acting on five key levers.** In the Consensus Policy Scenario, the five levers are set to recover operation and maintenance costs by 2025 and to reduce sector debt to JD 7.8 billion in 2040. Savings associated with each of the levers are expressed as avoided debt in 2040. The Consensus Policy Scenario sets the five levers in the following way:

- **Lever 1: Optimizing the efficiency of existing systems** – Efficiency gains include reducing NRW losses from 53 in 2022 to 25 percent by 2040, investments in EE and RE capacity. Together the net savings from these investments in efficiency will reduce sector debt in 2040 by JD 1,420 million.

- **Lever 2: Managing existing debt** – There is therefore limited scope for restructuring legacy domestic debt (due to penalty clauses in contracts) or legacy external debt (as most of it is already on concessional terms). However, avoiding penalties form the build-up of unauthorized arrears to PPPs and electricity supply companies could reduce 2040 debt by JD 215 million.

- **Lever 3: Minimizing the Cost of Capital for New Water Systems** – Based on an estimated CAPEX cost of JD 2 billion for the AAC reducing the cost of capital from 8.1 percent (the rate calculated for the Disi Pipeline) to 5 percent this would reduce PPP lease payments for the AAC by JD 1,015 million so reducing 2040 debt by this amount.

- **Lever 4: Minimizing OPEX of new water systems** – In March 2022 a Cabinet Resolution stated that electricity would be provided to the AAC at the cost of 57 fils/kWh. This would lead to a potential saving of JD 2,268 million over the period to 2040 compared to the current 96 fils/kWh.

- **Lever 5: Predictable revenue flows** will come from both MoF transfers and from water and sewer tariffs. These measures will bring the cost coverage of O&M back to 100 percent in 2025 and then again in 2030 following the connection of the AAC (which will cause an initial drop in cost recovery when it comes on-line in 2027/28). Over the period to 2040 this will reduce sector debt by JD 1,678 million. The lease fees to the PPP projects (Disi, As Samra and AAC) will be covered from MoF transfers. Following past precedent these transfers to WAJ will be treated as advances from the Ministry of Finance and so would not reduce sector debt but would avoid the accumulation of arrears.

5. The combined savings of acting on these five levers would reduce 2040 debt forecasts from JD 14 billion to JD 7.8 billion a total saving of **JD 6.2 billion**.

6. **The Consensus Policy Scenario for restoring financial sustainability depends on the full functioning of the five levers – the most sensitive is lever 4 which acts on the AAC energy costs.** Minimizing OPEX of new water systems (Lever 4) is very sensitive to the cost of electricity. This is because the AAC is expected to draw on 300 megawatts of installed electricity generation capacity. If the energy costs for the AAC rise from 57 fils/kWh to 96 fils/kWh JD 2,268 million would be added to the debt stock in 2040. All of the financial levers are also predicated on sustainable management of water resources in the context of high interannual rainfall variability and the effects of climate change.

7. **The financial model underlying the Consensus Policy Scenario should be revised regularly as new information emerges.** As greater certainty on sector costs and the implementation of efficiency gains become apparent the FSR financial model should revised to reassess the effect of the levers and other exogenous factors.

ANNEX 7: Financial Management

1. **Financial Management Arrangements**. The WAJ will manage the Project's FM and disbursement functions. WAJ has prior experience implementing similar operations financed by international organizations (USAID, GIZ, AFD, JICA, KfW, EBRD) but lacks knowledge and experience in the World Bank's FM policies. Given the limited experience in World Bank FM and disbursement policies and the expected high workload on the finance staff, the project will recruit a Finance Officer familiar with similar operations to manage the project's FM and disbursement functions. The World Bank will also provide training to WAJ, MWI, JVA, and the three WCs on the World Bank FM and disbursement guidelines.

2. **The World Bank assessed the FM systems of the WAJ, MWI, JVA, and the three water companies (MWC, YWC, AWC).** The assessment concluded that with the implementation of agreed-upon actions, the proposed FM arrangements would satisfy the minimum FM requirements under the World Bank policy on IPF with PBCs. Based on the FM assessment, the overall FM risk is "Substantial". (please refer to section VI- Key Risks).

3. **Budgeting and Eligible Expenditures.** The project will be included in the national budget of WAJ, JVA and MWI starting 2024. WAJ will maintain a detailed annual disbursement plan to monitor the project's financial progress closely. This plan will be developed based on the initial procurement plan, approved business plans, and the schedule of outputs as defined in the implementation schedule and estimated payments cycles - revised upon need. It will be used as a monitoring tool to analyze budget variances and manage cash and feed into the semiannual IFRs.

Annex 7, Table 1: Eligible Expenditures and Disbursement Methods

	Procurable expenditures: Either reimbursable upon documentation or using the DA and the(advance-basis disbursement	Incremental operational expenditures: Treasury Account (operational expenditures linked with PBCs, reimbursable basis)
Component 1. Sustainable non-revenue water reduction ($209m)		
Sub-component 1.1. NRW reduction ($155m)	Goods, works, consulting services, non-consulting services to prepare and deliver NRW related systems and infrastructure ($155m)	Not applicable
Sub-component 1.2. Modernized systems for sustaining NRW reduction (including collections efficiency, and financial management systems)($48m) PBC 1 & 2 ($27m)	Goods, consulting services, non-consulting services, training, for: central NRW unit operationalization; TA to prepare performance-based contracts and enhance engagement with the private sector; and to operationalize UofF and related recommendations to strengthen performance at the level of the WCs ($21m)	Operational budget to cover incentives, and related operational expenses for WAJ, MWI and WC staff, to support their expanded mandate to improve operational performance, engage the private sector and strengthen monitoring and reporting systems for NRW ($27m)
Sub-component 1.3. Financial sustainability studies, community engagement and demand-control actions ($6m) PBC 3 ($3m)	Goods, works, consulting services, non-consulting services for institutional measures needed for community engagement and education on the need for advanced water efficiency such and increase income earning opportunities for women in the sector ($3m)	Operational budget to cover incentives, and related operational expenses for WAJ, MWI and WC staff, to support their expanded mandate to deliver on strengthened community engagement, outreach and demand control measures ($3m)
Component 2. Increased energy efficiency and reduced energy supply costs ($54m)		
Sub-component 2.1. Improving energy efficiency in the existing water systems ($54m)	Goods, works, consulting services, non-consulting services to improve EE and RE in the water sector	Not applicable
Component 3.Water security measures to underpin efficiency improvements ($27m)		
Sub-component 3.1. Strengthening water allocation and drought management systems ($9m) PBC 4 ($3m)	Goods, works, consulting services, non-consulting services to deliver on water allocation and drought management systems improvements ($6m)	Operational budget to cover incentives and related operational expenses for MWI, JVA, WAJ staff, to support their expanded mandate to deliver on drought and water allocation objectives ($3m)
Sub-component 3.2.	Goods, works, consulting services, non-consulting	Operational budget to cover salaries, incentives,

Assessment of water storage system rehabilitation needs ($18m) PBC 5 ($6m)	services related dam rehabilitation investments; Goods, consulting services, non-consulting services for development and operationalization of the risk indexing tool, sediment management plans, assessments of dam rehabilitation investments ($12m)	and related operational expenses for JVA staff, to support their expanded mandate to deliver on water storage performance objectives, related to development and operationalization of the risk indexing tool, sediment management plans and advanced assessments of dam rehabilitation investments ($6m)
Component 4. Project management and implementation support ($10m)		
Sub-component 4.1. Project management and implementation support ($8m)	Goods, consulting services, non-consulting services for project management and implementation support ($8m)	Not applicable
Sub-component 4.2. Verification support ($2m)	Goods, consulting services, non-consulting services for verification of achievement of PBCs ($2m)	Not applicable

4. **Financial Sustainability Analysis**. The financial position of WAJ, MWC, and YWC as of December 31, 2021, indicates concerns about their financial sustainability. The latest audit reports reported the following issues: ,

WAJ**:** The Authority recorded high annual losses of JOD 224.8 million (317.5 million) in 2021 and JOD 413.2 million (583.6 million) in 2020. Operational losses reached JOD 34.3 million (US$ 48.4 million) in 2021 and JOD 37.9 million (US$ 53.5 million) in 2020. The Authority's accumulated losses reached JOD 3.4 billion (US$ 4.8 billion), exceeding 96 percent of the Authority's registered capital.

MWC. The Company's accumulated losses of JOD 5.1 million (US$ 7.2 million) exceeded 513 percent of the company's registered capital. The company recorded operational losses of JOD 10.4 million (US$ 14.7 million) in 2021 and JOD 16.6 million (US$ 23.4 million) in 2020.

YWC. The company's accumulated losses of JOD 50.8 million (US$ 71.7 million) exceeded 1,071 percent of the company's registered capital. The Company recorded high annual losses of JOD 49.5 million (US$ 69.9 million) in 2020 and JOD 51.7 million (US$ 73 million) in 2019.

5. WAJ, MWC, and YWC rely significantly on financial support from the central government to continue operating. A FSR was developed and approved by the Cabinet of Ministers in November 2022. Implementing the FSR is key to restoring the financial sustainability of the sector, including WAJ, MWC, and YWC.

6. **Accounting and Financial Reporting**: The project will follow the cash basis of accounting. Key accounting policies and procedures will be documented in the financial procedures manual and finalized before project effectiveness. WAJ, MWRI, and JVA use Government Financial Management Information System (GFMIS) for budget preparation and execution. The GFMIS provides information on how the annual Budget Law and its execution support the government's strategic priorities. The current GFMIS utilizes a subset of the functionalities of the underlying application software. The three WCs use in-house accounting systems that are found acceptable. However, they are not capable of generating Interim Unaudited FRs in accordance with the World Bank FM guidelines. Therefore, the accounting systems of WAJ and the three WCs will be used to capture the financial transactions, but the IFRs will be generated using excel. WAJ will be responsible for submitting consolidated semiannual IFRs and submitting them to the World Bank within 45 days after the end of each semester. WAJ will work directly with implementing agencies to collect the financial data necessary to prepare the consolidated IFRs, which will include the following statements: i) a statement of sources and uses of funds, ii) cashflow forecast, iii) a comparison of actual and planned expenditures by activity, iv) Designated Accounts reconciliation statement, v) Contracts listing of all contracts showing amounts committed, disbursed and physical work progress for civil works contracts, and vi) list of assets.

7. **Internal Controls**. WAJ, MWI, and JVA follow the controls specified in the applicable Financial By-law (1994) and its Amendment (2015) and the Financial Control By-law (2011), and its Amendment (2015), which includes: (i) technical

approval of the department involved; (ii) checking and approval by finance staff; (iii) verification of the accuracy of the payments and its compliance with the applicable laws in Jordan and the World Bank procurement and FM procedures as well as the Loan terms and conditions. On the other hand, the three WCs follow their own internal procedures for financial management approved by their Board of Directors. The internal procedures cover the main FM topics, including, among others, authorities, payment controls, accounting standards and bookkeeping, budgeting and reporting, accounting and reporting, safeguarding of assets, cash and banks, and external auditing. Each WC has an internal audit department that reports directly to the Board of Directors. The Internal Audit units follow risk-based internal auditing but not fully consistent with the International Standards on Internal auditing. The project will support strengthening the three WCs to strengthen their internal audit function by :i) conducting professional risk assessment of business processes, ii) implement internal audit IT systems, iii) developing audit planning, iv) internal audit report writing, and v) hiring additional staff in the specific topic to train staff on international internal audit standards and leading practices. A POM will be developed that includes a FM manual. This manual will document the Project's implementation of internal control functions and processes and describe the roles and responsibilities of the project staff and finance department, summarized in terms of authorization and execution processes. The manual will also describe clearly the fiduciary responsibilities on related financial procedures and controls to be set in place and the required financial reporting obligations.

8. **Controls over Payroll**. Considering that the program will cover part of the staff salaries of WAJ and MWI under the PBCs, the assessment covered payroll management systems in these agencies. The payroll systems at WAJ and MWI have a good degree of integration and reconciliation between the position controls, personnel records, and payroll registers. MWRI and WAJ's payroll system follows the Civil Service Bureau's instructions and is in line with the national financial law and internal controls regulation, in addition to instructions issued by the MOF. The Human Resources (HR) department is responsible for receiving the information for the appointed employee for entry into the automated HR database system. The HR department ensures the completeness of the information and the data entry of related salary entitlements through an automated system and records archival in the system and in paper files. A payroll schedule is prepared monthly and subject to several layers of approvals (payroll officer, head of the payroll unit, the department manager [budget holder], Internal Control Department, and the financial management manager. Salaries are transferred to employees' bank accounts.

9. **External Auditing**. A private sector external auditor acceptable to the World Bank will be contracted, following the Terms of Reference acceptable to the World Bank. WAJ will be responsible for preparing the TOR for the auditor and submitting them to the World Bank for clearance. The auditor's scope of work will also include providing an audit opinion on the efficiency of the project's internal controls. Private sector audit firms and the Jordan Audit Bureau audit WAJ and the three WCs' financial statements annually. WAJ and the three WCs will provide a copy of their annual audited financial statements, while the Jordan Audit Reports are published on the Bureau's website. The project's external auditor's scope will be expanded to review the semiannual IFRs.

10. **Disbursements.** Project disbursements will follow IFRs based disbursement method, in accordance with the World Bank's disbursements guidelines, as outlined in the disbursement and financial information letter (DFIL). There are two disbursement requirements under category four: (a) eligible expenditures incurred and paid, and (b) PBCs achieved and verified. WAJ will hold a DA at the Central Bank of Jordan to receive loan proceeds to finance the project activities. MWI, JVA and the WCs can i) ask WAJ to pay vendors/suppliers on their behalf, or ii) open a Bank account (project account) in an acceptable bank to receive the advances from the DA to finance their activities. These bank accounts will solely be used for the project, and the advances will be replenished by WAJ, subject to submitting supporting documents showing the eligibility of expenditures made. The Government Single Treasury Account will be used to receive the loan proceeds against PBCs for incremental operational expenditures. These expenditures will be reimbursed in alignment with the project eligible expenditure table and WAJ, MWI and JVA budget lines.

It is anticipated that the project will be co-financed by AFD, funds will be disbursed on a pari passu basis. The share of AFD is agreed to be 16.69percent of total project allocation. The verification of the PBCs will be conducted by an IVA to be contracted by WAJ. Meanwhile, the eligible incremental operational expenditures will be reported semiannually to the World Bank through Interim FRs for which the design and content were agreed upon with WAJ. The funding against expenditures incurred for implementing PBCs following the Eligible Expenditure Program (EEP) will be transferred directly by the World Bank to MOF Treasury Single Account. Any balance of the allocated EEP disbursement not disbursed at any disbursement cycle may be carried forward to be paid during a subsequent disbursement cycle once there is evidence that the PBC has been achieved.