TECHNICAL SPECIFICATIONS

Enhancing the Integrated Management of Direct Treated Wastewater Reuse in Jordan: Assessment, Metering Pilot Testing and Implementation Toolkit

implemented within the AdaptAction program





for the

AGENCE FRANCAISE DE DEVELOPPEMENT

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Table of content

Article 1. GENERAL CONTEXT 3

1.1 Presentation of the Agence Française de Développement (AFD) 3

1.2 Presentation of the AdaptAction Program 3

Article 2. CONTEXT AND PURPOSE OF THE ASSIGNMENT 3

2.1 Context 3

2.2 Objectives of the Assignment 5

1. SCOPE OF WORK 6

3.1 Inception phase (2 weeks) 6

3.2 Diagnostic Assessment (2 months) 7

3.3 Case Studies (month 3 to 11) 8

3.4 Development of the National Operational Framework and Implementation Toolkit 9

3.5 Recommendations for National Roll-out and Scaling-up of the Operational Framework 10

Consultation and validation workshops 11

2. DELIVERABLES AND CONDITION OF DELIVERY 11

4.1: Description of Expected Deliverables 11

4.2: Validation of the deliverables 13

3. QUALIFICATIONS 13

5.1 Qualification of the team of consultants 13

5.3 Additional considerations 15

4. LOGISTICS AND CONTRACT EXECUTION SCHEDULE 16

6.1 Provisional Timeline 16

6.2 Monitoring of the assignment 16

5. CONTRACTUAL AND WORKING LANGUAGE 17

6. BUDGET 17

8.1 Level of effort 17

8.2 Financial offer 17

7. ANNEXES 17

Article 1. GENERAL CONTEXT

1.1 Presentation of the *Agence Française de Développement* (AFD)

As a public financial and solidarity institution, AFD is the central player in French development cooperation. It participates in projects that tangibly improve the daily lives of people in developing and emerging countries, as well as in French overseas territories. Through its work in numerous sectors (energy, health, biodiversity, water, digital economy, education, etc.), AFD supports the transition to a safer, fairer, and more sustainable world—our "world in common." Its actions are fully aligned with the Sustainable Development Goals (SDGs).

The AFD team works on more than 4,200 projects aimed at having a positive social and environmental impact in 150 countries and French overseas territories.

The AFD group has been working in Jordan since 2006, primarily on issues related to climate change adaptation and social cohesion, through solidarity-based and sustainable investments. As key partners in the water sector, AFD and Proparco (its subsidiary targeting the private sector) also support major infrastructure projects to preserve and promote access water (including treated wastewater reuse), addressing water stress in particular.

More information on the Group's activities and organization is available on its website: https://www.afd.fr/en

1.2 Presentation of the AdaptAction Program

AdaptAction is a technical assistance program of the AFD. Since 2017, it has supported partner countries in implementing climate-resilient development pathways. Through vulnerability and feasibility studies for project preparation, support for the design of national policies and action plans, as well as capacity-building and institutional strengthening initiatives, AdaptAction facilitates countries' access to international climate finance and accelerates investments in adaptation.

The second phase of AdaptAction, launched in 2022, now covers 20 countries. It is structured around three pillars (Understanding, Planning, Investing) and two cross-cutting components (Gender and Social Inclusion, and Knowledge Management and Valorization). It is co-financed by the European Union in the Middle East and North Africa for a period of four years (2024-2028).



For more information about the program, please visit: https://www.afd.fr/en/adaptaction.

Article 2. CONTEXT AND PURPOSE OF THE ASSIGNMENT

2.1 Context

Jordan is recognized as one of the most water-scarce countries globally, with renewable freshwater resources estimated at less than 100 m³ per capita per year—well below the internationally recognized threshold of 500 m³ per capita defining absolute water scarcity. Demographic growth, urbanization, successive refugee influxes, groundwater over-abstraction, and the increasing impacts of climate change have further widened the gap between water demand and available resources. Climate projections for Jordan indicate rising temperatures, increasing evapotranspiration, and more frequent drought events, placing additional stress on already limited conventional water resources.

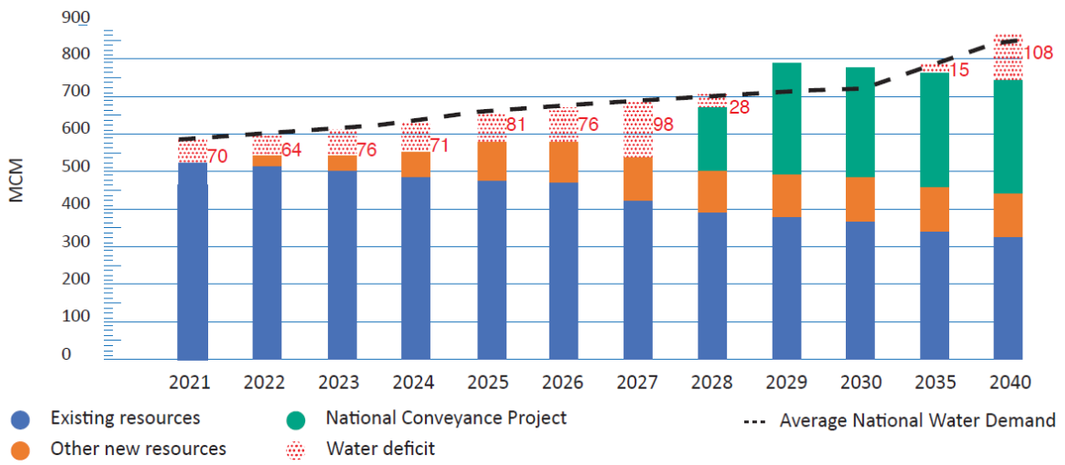
In response to these challenges, the Government of Jordan has progressively shifted its water policy towards the development of non-conventional water resources, particularly treated wastewater (TWW), desalination, demand management, and water loss reduction. The National Water Strategy 2023–2040 sets

as one of its priorities to “Expand reuse of reclaimed water” in order to “Safely manage and treat wastewater to protect the environment, health and nature while expanding wastewater services and maximizing reuse of treated wastewater” (Goal 3, Objective 3.3), recognizing reclaimed water as a valuable resource that can substitute freshwater in agriculture while preserving higher-quality water for municipal and industrial uses.

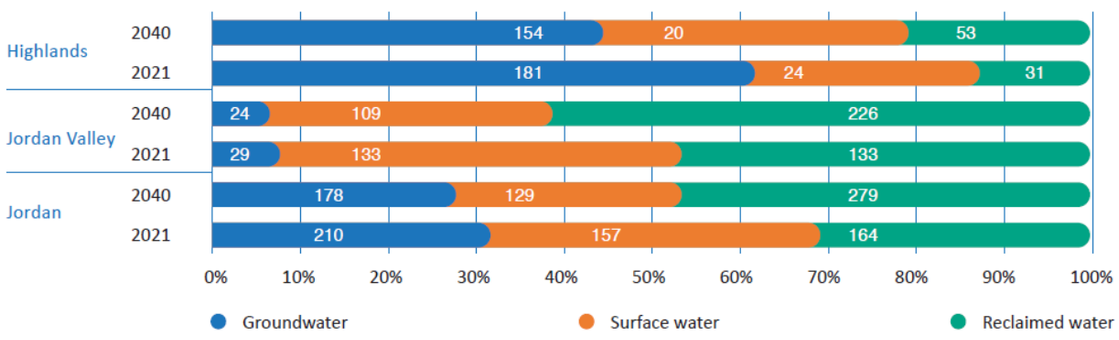
Jordan has become a regional leader in wastewater reuse, particularly through the indirect reuse model centered on the As-Samra Wastewater Treatment Plant. Treated effluent discharged into the Zarqa River is conveyed to King Talal Reservoir, blended with surface water, and subsequently used to irrigate approximately 10,000 hectares in the Jordan Valley. This model has demonstrated the technical feasibility and economic value of reclaimed water when supported by adequate storage, blending infrastructure, and institutional management.

Alongside this large-scale indirect reuse scheme, a growing number of direct reuse systems have developed around wastewater treatment plants across the Kingdom. In these schemes, treated effluent is conveyed directly from treatment plants to nearby agricultural land without intermediate storage or blending. Such systems are currently operating or emerging around several wastewater treatment plants, including Madaba, South Amman, Aqaba, Ramtha, and Wadi Musa. Direct reuse is expected to become increasingly important as additional treatment plants are commissioned and existing facilities are upgraded under Jordan's ongoing wastewater investment program.

The amount of (direct, in the highlands, and indirect, mainly in the Jordan Valley) treated wastewater will indeed significantly increase thanks to the National Conveyance project (NCP) – see figures below.



Evolution of Water Resources in Jordan between 2021 and 2040 in MCM (MWI, National Water Strategy 2023-2040)



Current and Future Water Resources for Irrigation in MCM (MWI, National Water Strategy 2023-2040)

Direct reuse presents a distinct set of technical, institutional, regulatory, and social challenges that influence farmer acceptance. Farmer acceptance remains a critical determinant of successful wastewater reuse. These challenges include:

- Infrastructure on farms surrounding wastewater treatment plants, including storage ponds, irrigation networks, pumping systems, meters, and related facilities, is often inadequately designed, operated, and maintained.
- Low water quality prevents the cultivation of high-value crops according to Jordanian standards (Standard JS 893, which regulates the quality, treatment requirements, and allowable uses of treated domestic wastewater in Jordan). Low water quality also presents issues regarding market acceptance. Nonetheless, upgrading a number of wastewater treatment plants, including those in Madaba and South Amman, will allow for high water quality and the cultivation of higher-value crops.

- Operational difficulties in implementing reuse schemes by water companies, who are responsible for day-to-day interactions with farmers while the Water Authority of Jordan drafts and signs farmer agreements.
- Lack of adequate institutional support and technical advisory services for farmers to ensure the safe and efficient use of treated wastewater.
- Poor monitoring of water consumption for irrigation results from the absence of a reliable, fully enforced metering system. This leads to significant treated wastewater waste and limited bill collection.

Also, while significant investments have been made in wastewater treatment infrastructure, Jordan currently lacks a comprehensive operational framework specifically addressing the planning, implementation, monitoring, and management of direct wastewater reuse around treatment plants, including its management by farmers inside the farms. Existing arrangements have evolved independently across different locations, resulting in inconsistent technical specifications, varying contractual models, fragmented institutional responsibilities, and limited opportunities for knowledge sharing and replication.

In line with the Water Authority's strategic objective of expanding the installation of water meters for farmers nationwide, the Water Authority has requested that the French Development Agency (AdaptAction Program) fund a comprehensive institutional and technical study aimed at improving. **the overall management of treated wastewater reuse in these areas, particularly to examine the conditions under which a metering system could be introduced**

This study is undertaken as a focused, operational study that complements—rather than duplicates—existing and forthcoming national planning instruments, including the Reuse Master Plan and related water-sector strategies, policies and investment programs (cf. list of relevant documentation in annex 1).

The study will translate relevant strategic directions into practical operational tools that can be tested and refined through three case studies. It shall begin with a structured review and mapping of existing and planned studies, master plans, donor-supported initiatives and institutional programs relevant to direct treated wastewater reuse, metering, farmer acceptance, capacity building and agricultural development. The Consultant shall explicitly identify areas already addressed by these instruments and focus the assignment on operational gaps, implementation interfaces and issues requiring practical tools or pilot testing. The study will provide practical recommendations, a user-oriented implementation toolkit and evidence from three case studies.

The assignment directly contributes to Jordan's national adaptation priorities, supports Integrated Water Resources Management (IWRM) principles, advances the circular economy by promoting the productive reuse of treated wastewater, and contributes to the achievement of Sustainable Development Goals (SDGs), particularly SDG 6 (Clean Water and Sanitation), SDG 2 (Zero Hunger), and SDG 13 (Climate Action).

2.2 Objectives of the Assignment

Overall Objective

The assignment's main goal is to develop and **validate a practical, operational approach and implementation toolkit for meter deployment and management for direct reuse**. The study will be based on evidence from three case studies and will specify the conditions for farmers to accept metering and reuse treated wastewater, including awareness and communication, contractual and incentive arrangements, and coordination among institutions responsible for water, agriculture, and extension.

The assignment shall complement existing and forthcoming national plans and strategies rather than duplicate them.

The assignment will establish a concise operational reference framework and set of tools that can be applied by WAJ and partner institutions at reuse sites. It shall distinguish clearly between (i) issues already addressed by existing or forthcoming master plans and sector programs, (ii) operational gaps that require site-level solutions, and (iii) recommendations that require decisions or actions by institutions beyond WAJ. The study shall prioritize practical, testable solutions over preparation of a comprehensive national investment plan.

Specific Objectives

The assignment shall pursue the following specific objectives:

1) Conduct a **targeted national diagnostic of direct treated wastewater reuse arrangements** relevant to the study, with emphasis on operational practices at treatment-plant and farm level. This includes practices related to metering, farmer acceptance, contractual arrangements, pricing/cost-recovery practices, awareness and capacity-building, etc. The diagnostic shall explicitly identify what is already covered by existing or forthcoming master plans, policies and programs and what additional operational guidance is required.
2) **Review the legal, regulatory, policy and institutional requirements** relevant to metering and efficient direct reuse for agriculture in Jordan, identifying only those gaps that affect implementation of the operational solutions proposed by the study. The review shall include a mapping of relevant donor and development-partner initiatives—ongoing, recently completed or planned—covering capacity building, direct reuse, metering, farmer support and local agricultural development linked to reuse, in order to identify complementarities, avoid duplication and identify opportunities for collaboration.
3) **Benchmark practical metering options suitable for treated wastewater applications** in Jordan, including accuracy, reliability, installation, operation and maintenance, remote reading/telemetry, data management, lifecycle costs, local availability and compatibility with reuse-water characteristics. The assessment shall also examine the implications of meter deployment for farmers, including installation and recurring costs, ownership, reading, maintenance and data responsibilities. As an optional tranche, the assignment will also **pilot the deployment of a maximum of 15 meters (five per pilot site) with WAJ and provide support for up to six months to ensure regular maintenance.**
4) Undertake a structured **farmer needs and acceptance assessment in the three case-study areas,** covering willingness and ability to use meters, perceptions of treated wastewater, concerns about safety, quality and agricultural productivity, affordability, contractual conditions, trust, information needs, incentives and potential barriers to compliance. The assessment shall consider both mandatory measures and positive incentives, drawing on international experience to identify conditions that facilitate farmer acceptance.
5) Develop practical **institutional, contractual and operational arrangements for the implementation and management of the proposed solutions**, clearly defining the roles of WAJ, relevant Water Companies, the Ministry of Water and Irrigation, Ministry of Agriculture (MoA), Jordan Valley Authority (JVA), National Agricultural Research Center (NARC), local authorities, Water User Associations/cooperatives and farmers. The study shall propose a coordination mechanism, including a Steering Committee, to support cross-sectoral ownership and validation.
6) Develop an **Implementation Toolkit containing practical guidance, templates, decision tools and model arrangements that can be applied and adapted at reuse sites**. The Toolkit shall include, as relevant, metering specifications and selection criteria, installation and O&M procedures, data-management templates, farmer engagement and awareness materials, contractual clauses, incentive/mandatory-measure options, pricing and payment considerations, monitoring indicators, and checklists for institutional coordination.
7) **Use three case studies as the principal mechanism for testing and validating the operational approach**. The case studies shall be selected to represent sufficiently different technical, institutional and agricultural conditions and shall include practical field testing or demonstration, where feasible, of metering and/or farmer-engagement measures. South Amman WWTP surrounding farms shall be prioritized as a principal case-study area, with the other sites selected during inception against agreed criteria.
8) Formulate recommendations based directly on the findings and results of the three case studies and pilots, distinguishing **site-specific actions from measures that can reasonably be replicated nationally**. A concise set of priorities and next-step actions shall be derived from the case studies.

1. SCOPE OF WORK

The assignment shall be implemented through a participatory, evidence-based and test-and-learn approach. It shall combine desk review, stakeholder mapping, field assessments, farmer needs assessment, international benchmarking, three case studies with pilot/demonstration activities where feasible, and structured validation workshops. Recommendations shall be explicitly traced to evidence from the diagnostic and the three case studies.

3.1 Inception phase (2 weeks)

At the commencement of the assignment, the Consultant shall participate in a kick-off meeting with all involved stakeholders.

The Consultant shall undertake a structured document and initiative review. In addition to the documents listed below, the Consultant shall identify and review relevant existing and forthcoming master plans (including the Reuse Master Plan, where available), strategies, policies, previous studies, tariff/pricing studies, metering assessments, donor-supported projects, direct reuse projects, agricultural development

initiatives and capacity-building programs. The Consultant shall prepare a matrix showing the scope, status, lead institution, geographic coverage, relevant findings and interfaces of these initiatives and shall identify gaps that this assignment should address.

Based on this review, the Consultant shall refine the methodology, confirm the three case-study selection criteria and proposed sites, prepare the stakeholder and institutional coordination plan, define the farmer needs-assessment methodology, establish the benchmarking framework, and identify feasible pilot/demonstration actions.

The Inception Report shall include a detailed deliverable schedule and consultation plan specifying the minimum workshops required under this ToR.

Deliverable (after 2 weeks): The Inception Report will serve as the operational reference document for the implementation of the study and shall be submitted for review and approval before the commencement of the subsequent phases.

The Consultant shall, during inception, prepare and maintain a list of key documents reviewed, including relevant national strategies and policies, the Reuse Master Plan (or draft/terms of reference where applicable), previous pricing/tariff and metering studies, relevant donor/development-partner initiatives, direct reuse project documentation, applicable standards and guidelines, and key agricultural/extension programmes. The final submission shall include the initiative-mapping matrix and evidence/reference list as an annex.

3.2 Diagnostic Assessment (2 months)

Following approval of the Inception Report, the Consultant shall undertake a focused diagnostic assessment and initiative mapping. The objective is to establish an evidence base for the operational toolkit, identify gaps not already addressed through existing or forthcoming plans, and select practical issues for testing through the three case studies.

Institutional framework assessment
The Consultant shall assess the mandates, interfaces and operational responsibilities of WAJ, MWI, Water Companies, MoA, JVA, NARC, municipalities/local authorities, Basin Directorates, Water User Associations/cooperatives and farmers. Particular attention shall be given to responsibilities that fall outside WAJ's direct mandate and therefore require formal coordination, delegation or joint implementation. The Consultant shall propose a practical governance arrangement for the study and for future application of the Toolkit, including the proposed Steering Committee and site-level coordination mechanisms.
The Consultant shall map existing, ongoing and planned capacity-building, awareness, extension, monitoring and technical-support initiatives, identifying target institutions and users, geographic coverage, delivery partners, outputs and remaining gaps. The assessment shall specifically identify capacity needs for WAJ/Water Company operational staff, MoA/JVA agricultural extension personnel, NARC/research staff, local authorities, Water User Associations/cooperatives and farmers, as relevant to the Toolkit.

Regulatory framework assessment
The Consultant shall review the legal and regulatory framework only to the extent necessary to operationalize the proposed solutions. This shall include the rules governing metering, allocation, contracts, farmer obligations, monitoring, pricing/payment, incentives and enforcement. The Consultant shall identify provisions that enable or constrain mandatory metering and farmer compliance and shall distinguish issues that can be addressed operationally from those requiring policy or regulatory decisions.

Technical framework for wastewater metering
The Consultant shall assess and benchmark practical metering solutions, including capital and recurring costs, installation requirements, ownership, calibration, maintenance, data management, remote reading and telemetry. The assessment shall include a review of existing pricing and cost-recovery arrangements for treated wastewater and relevant prior studies. It shall determine whether pricing can be meaningfully addressed within this assignment and, where sufficient evidence exists, propose options or principles for pricing/payment structures linked to metering and contractual models. Where the issue has already been studied, the Consultant shall build on and reference the existing evidence rather than duplicate it.

International benchmark
To complement the national assessment, the Consultant shall undertake a comparative review of international experience in direct wastewater reuse management, with particular emphasis on countries facing climatic and institutional conditions comparable to those of Jordan such as the examples of Cyprus,

Spain (with reference to Murcia and/or the Canary Islands) and Tunisia. The benchmarking exercise shall analyze international practices related to governance arrangements, regulatory frameworks, metering technologies, digital monitoring systems, contractual models, financing mechanisms and stakeholder engagement. Lessons learned from these experiences shall be critically assessed and adapted to the Jordanian context to support the preparation of practical and implementable recommendations.

Deliverable (after 2 months): Diagnostic, Existing Initiatives and International Benchmark Report

3.3 Case Studies (month 3 to 11)

The Consultant shall undertake three detailed case studies at selected wastewater treatment plants representing different technical, institutional and socio-economic contexts. South Amman WWTP surrounding farms shall be treated as a priority case study, with two additional sites selected during inception based on criteria including the presence or feasibility of metering, farmer diversity, institutional arrangements, agricultural characteristics, operational maturity and potential for practical demonstration. The three case studies shall collectively provide the evidence base for the Toolkit.

Field assessment and proposed solutions for pilot implementation (month 3)
For each case study, the Consultant shall undertake a structured field assessment covering infrastructure and operations, current metering and data practices, contractual arrangements, pricing/payment, institutional roles, farmer needs and perceptions, farming practices and market opportunities, awareness levels, extension support and barriers to acceptance of treated wastewater and metering. The farmer needs assessment shall identify differentiated needs, concerns, incentives, affordability considerations and preferred communication channels. Where appropriate, the assessment shall consider the role of women and other groups involved in farm management and decision-making without creating a separate social study.

Building on the diagnostic and farmer needs assessment, the Consultant shall prepare a practical package of site-specific solutions for each case study. Subject to WAJ/AFD approval and site feasibility, the Consultant shall test or demonstrate selected measures, prioritizing low-cost operational interventions such as meter deployment or verification, improved meter reading/data practices, farmer communication, awareness sessions, contractual/incentive arrangements and on-farm good-practice demonstrations. Each pilot shall have clear objectives, implementation steps, responsibilities, indicators and a simple before/after assessment of acceptance and operational performance.

The Consultant shall explicitly identify areas already addressed by these instruments and focus the assignment on operational gaps, implementation interfaces and issues requiring practical tools or pilot testing.

Dimension	Key questions to address
1.Technical	Which meters type and configuration are appropriate for the reuse conditions? What are capital and recurring costs, energy needs, maintenance requirements, reading/telemetry options and data-management arrangements? What products are locally available and affordable? How will meter accuracy and performance be verified?
2. Socio-economic	What do farmers need to accept and use meters and treated wastewater? How is compliance with quality and use rules encouraged? How is farmers' buy-in secured, through which incentive? What role may Water User Associations play in building trust and acceptance? How insuring optimized and safe water management and farming systems? What role is to be played by agricultural extension services?
3. Regulatory	What legal and regulatory provisions govern metering, allocation, pricing/payment, contracts, farmer obligations, monitoring and enforcement? Which changes are necessary, and which can be addressed through operational procedures or contractual arrangements?
4. Institutional (operational)	Who owns, installs, reads, maintains and finances meters? Who manages consumption data? How should pricing/payment be linked to measured use? What contractual model and service standards

Dimension	Key questions to address
	should apply between WAJ/Water Companies and farmers? What coordination is required with MoA, NARC, JVA and other institutions?

The solutions tested or developed shall, at minimum, address the following, as relevant to each case study: (i) meter selection, installation, operation, maintenance and data management; (ii) farmer acceptance and awareness measures; (iii) mandatory compliance measures and feasible incentives; (iv) pricing/payment and cost-recovery considerations; (v) contractual and institutional arrangements; and (vi) on-farm demonstration of safe and efficient treated wastewater use. The proposed arrangements shall identify how each demonstration or pilot can continue after completion of the study, where feasible.

- Contractual model(s) (including incentive mechanisms if any)
- Pilot metering
- On-farm demonstration for safe and efficient water management. The proposed operational and institutional arrangements shall ensure the continued operation and sustainable management of the demonstration farm beyond the timeframe of this study.

Deliverables (after 3 months): Three Case-Study Field Assessment and Pilot Design Reports.

Implementation phase: discussing and testing the solutions (month 4 to 7)
Proposed solutions shall be discussed (and possibly tested) through consultations with farmers, local authorities, Cooperatives, Water User Association, private sector, and other relevant stakeholders, including the Jordan Valley Authority (with its expertise in irrigation water distribution), and the Ministry of Agriculture (which is responsible for agricultural extension and on-farm), in order to understand operational challenges, institutional constraints and opportunities for improvement. Local governance committees might be established for this purpose.

The findings and measured/observed results of each case study shall be explicitly used to validate, modify or reject the proposed solutions. The Consultant shall produce a cross-case synthesis identifying which recommendations are site-specific, which are replicable, what enabling conditions are required, and what evidence supports each recommendation. The final Toolkit shall be based on this evidence rather than on the desk review alone.

Optional tranche – Pilot metering (month 5 to 11)

As an optional component, meter deployment will be tested at the case sites. Up to 15 meters will be deployed. These meters will be supplemented by meters that the Water Authority can deploy itself. Close coordination and technical support will be provided to all stakeholders to ensure the maintenance of the meters deployed under the project for up to six months. In addition, the anticipated number of deployed meters for case study purpose should be clear in the proposal and budget.

Deliverables:

- Case-Study Consultation and Pilot Progress Notes (Months 4, 5 and 6)
- Case Study Reports (Month 7)
- Reporting report on meter deployment and handover, and lessons learned (Month 11).

3.4 Development of the National Operational Framework and Implementation Toolkit

Based on the findings of the national assessment and the case studies, the Consultant shall develop an operational framework and Implementation Toolkit for meter deployment and management for direct treated wastewater reuse for agriculture around wastewater treatment plants. The framework shall provide practical guidance to the Water Authority of Jordan and other sector institutions (including ministry of agriculture) on the planning, implementation, operation, monitoring and expansion of such metering schemes.

The Toolkit shall include, as appropriate: metering selection and technical specifications; installation and commissioning checklists; calibration and verification procedures; O&M protocols; meter reading and data-management templates; roles and responsibilities; farmer communication and awareness materials; farmer acceptance and engagement tools; mandatory-measure and incentive options; pricing/payment considerations; model contractual clauses; guidelines for safe and efficient water reuse at farm level, monitoring indicators; and site-level implementation checklists. The Toolkit shall be designed for practical use by WAJ/Water Companies and partner institutions and shall identify which elements can be adapted locally.

The Consultant shall prepare or update model contractual arrangements governing treated wastewater supply and use, with particular attention to measured consumption, pricing/payment, meter ownership and maintenance, allocation, service standards, farmer obligations, compliance, incentives, dispute resolution and data management. Pricing shall be addressed through a review of existing Jordanian evidence and current practice, benchmarking of relevant international models, and discussion of how pricing interacts with metering and contractual arrangements. The **Consultant shall not undertake a standalone tariff reform study**.

Deliverables (after 9 months): Draft Operational Framework and Implementation Toolkit

3.5 Recommendations for National Roll-out and Scaling-up of the Operational Framework

The final phase of the assignment shall focus on developing practical recommendations and arrangements for rolling out and scaling up the operational framework and Implementation Toolkit at the national level. Building on the findings, lessons learned and validated solutions from the three case studies, the Consultant shall identify the conditions, institutional arrangements and actions required to progressively apply the framework to other direct treated wastewater reuse schemes across Jordan.

The Consultant shall assess how the operational framework and Implementation Toolkit can be replicated and adapted to different wastewater treatment plants and agricultural contexts, taking into account variations in infrastructure, water quality, metering arrangements, institutional responsibilities, contractual arrangements, farming systems, farmer acceptance and local operating conditions. The recommendations shall distinguish between core elements to be applied consistently at national level and elements that may need to be adapted to site-specific conditions.

The Consultant shall propose a **practical roll-out approach**, including:

- criteria for identifying and prioritizing wastewater treatment plants and agricultural areas for application of the framework;
- the sequence and conditions for extending the approach beyond the three case studies;
- institutional roles and coordination arrangements required for national roll-out, including the respective roles of WAJ, MWI, MoA, NARC, JVA, Water Companies and other relevant stakeholders;
- measures required to strengthen the capacity of institutions, operators, agricultural extension services, Water User Associations and farmers;
- arrangements for the progressive deployment and management of metering and associated data systems;
- mechanisms to support farmer acceptance, including communication, awareness raising, incentives and, where applicable, mandatory compliance measures;
- recommendations concerning the application of appropriate contractual and pricing arrangements, drawing on the findings of the benchmarking and case studies;
- mechanisms for monitoring implementation, documenting lessons learned and periodically updating the Implementation Toolkit; and
- Indicative sequencing of **short-, medium- and longer-term actions**, to the extent required to support progressive national roll-out.

The Consultant shall **not duplicate or replace existing or forthcoming national planning instruments**, including the Reuse Master Plan and other relevant sector strategies. Instead, the roll-out recommendations shall clearly identify how the operational framework and Toolkit developed under this assignment can complement and be integrated into these existing planning processes and institutional mechanisms. The Consultant shall also take into account relevant ongoing or planned initiatives supported by development partners and other stakeholders, particularly those related to capacity building, direct wastewater reuse, metering, farmer support and agricultural development.

The recommendations for national roll-out shall be **evidence-based and directly derived from the experience of the three case studies and any pilot or demonstration activities undertaken during the assignment**. The Consultant shall identify the solutions that have demonstrated sufficient technical, institutional and social feasibility to warrant wider application, as well as those requiring further testing or adaptation before being scaled up.

The Consultant shall further identify opportunities for **training, knowledge transfer and study visits** that could support institutional ownership and facilitate replication of the framework. The Consultant shall distinguish between activities that can reasonably be implemented within the scope of this assignment and those that would be more appropriately considered under subsequent capacity-building or investment programs. The Consultant shall explicitly assess whether short training sessions for operational staff and agricultural extension actors and/or targeted study visits to relevant reuse schemes would strengthen

institutional ownership of the Toolkit. The base proposal shall identify which activities can be delivered within the study budget and which, if any, should be treated as optional activities outside the base scope.

The final output of this task shall therefore be a **concise National Roll-out and Scaling-up Plan/Recommendations**, rather than a detailed national investment roadmap. It shall provide WAJ and its partner institutions with a practical basis for progressively applying, adapting and institutionalizing the operational framework and Implementation Toolkit across Jordan, while remaining aligned with the **National Water Strategy 2023–2040**, relevant national policies and plans, climate adaptation priorities and integrated water resources management principles.

Deliverables:

- Draft National Roll-out and Scaling-up Recommendations;
- Stakeholder Consultation and Validation Workshops;
- Final Report and Implementation Toolkit.

Consultation and validation workshops

The Consultant shall organize and facilitate a minimum of five structured validation workshops:

- one inception/diagnostic workshop,
- one validation workshop for each of the three case studies,
- and one national validation workshop on the draft Toolkit/final recommendations.

2. DELIVERABLES AND CONDITION OF DELIVERY

4.1: Description of Expected Deliverables

The Consultant shall submit all deliverables in accordance with the approved work plan and implementation schedule. Each deliverable shall be prepared in professional English and accompanied by an Executive Summary in Arabic. Unless otherwise agreed with AFD, all reports shall be submitted electronically in editable Microsoft Word format together with a searchable PDF version.

All reports shall be concise, analytical and evidence-based, presenting clear findings, practical recommendations and supporting annexes where appropriate. Maps, drawings, datasets, technical specifications, meeting minutes, photographs, consultation records and other supporting documentation generated during the assignment shall be included as annexes or submitted separately where relevant.

The expected deliverables are described below.

No.	Report & Deliverables	Date of Submission
Inception phase		
1	**The Inception Report** The report shall confirm the operational methodology, review of existing/forthcoming master plans and studies, donor/initiative mapping, stakeholder and Steering Committee arrangements, case-study selection criteria, farmer needs-assessment methodology, international benchmarking framework, pilot approach, consultation plan and detailed work program.	T0+2 weeks
Diagnostic assessment		
2	**Diagnostic, Existing Initiatives and International Benchmark Report.** The report shall present the targeted national diagnostic; mapping of relevant master plans, studies and donor/development-partner initiatives; institutional and regulatory assessment; review of metering and pricing evidence; farmer needs-assessment framework; and international benchmark including concrete examples such as Cyprus, Spain (Murcia and/or the Canary Islands) and Tunisia. It shall identify gaps that the study will address operationally. A specific focus shall be placed on existing (or missing) capacity-building initiatives aimed at supporting the development of safe and sustainable direct reuse practices in Jordan.	End of Month 2

	The Diagnostic Report shall include an International Benchmarking, reviewing relevant international experience in direct wastewater reuse management. The report shall analyse selected international case studies, highlighting governance arrangements, regulatory frameworks, technical standards, metering technologies, contractual models, financing approaches and stakeholder engagement mechanisms. The benchmarking exercise shall conclude with a set of lessons learned and recommendations applicable to the Jordanian context.	
Case studies		
3	**Three Case-Study Field Assessment and Pilot Design Reports.** One report for each selected case study, including South Amman WWTP surrounding farms as a priority case study. Each report shall document baseline conditions, farmer needs and acceptance, metering arrangements, pricing/payment and contractual conditions, institutional roles, awareness needs, proposed pilot measures, responsibilities, indicators and implementation requirements. The Consultant shall prepare separate technical reports for each selected case-study site during the inception phase. Each report shall document the existing infrastructure, institutional arrangements, operational practices, stakeholder perspectives, technical challenges and opportunities for improvement. The report shall propose site-specific solutions to be discussed and tested with local stakeholders	Month 3
4	**Case-Study Consultation and Pilot Progress Notes**. The Consultant shall document the implementation of approved pilot/demonstration measures, farmer and stakeholder feedback, meter deployment/verification where applicable, awareness activities, emerging lessons and corrective actions. The Consultant shall organize at least one validation workshop for each case study. The consultants shall monthly report on the activities implemented in each specific area. Monthly report shall include the minutes of all local consultation meetings	Month 4 - 6
5	**Case Study Reports.** The reports shall analyse the site-specific recommendations implemented and demonstrate how the proposed national framework can be adapted to different operational contexts.	Month 7
6	**Reporting report on meter deployment and lessons learned.** The reports shall report on results of meter deployment piloting and support to their maintenance, and provide key lessons learned.	Month 11
Development of the National Operational Framework and Implementation Toolkit		
7	**Draft Operational Framework and Implementation Toolkit.** The draft shall consolidate the validated operational approach and include practical tools, metering specifications, O&M and data procedures, farmer engagement and awareness tools, mandatory/incentive options, pricing/payment considerations, contractual models, institutional roles, capacity-building recommendations and monitoring indicators.	Month 9
Recommendations for National Roll-out and Scaling-up of the Operational Framework		
8	**Draft National Roll-out and Scaling-up Recommendations.** Recommendations for progressively applying the Operational Framework and Implementation Toolkit beyond the three case studies. The document shall define criteria for prioritizing sites, conditions for replication, institutional and capacity requirements, arrangements for coordination with relevant institutions,	Month 10

	opportunities for training and study visits, and indicative sequencing of roll-out actions. It shall clearly distinguish between elements that should be standardized nationally and those requiring site-specific adaptation. The recommendations shall complement, and not duplicate, existing or forthcoming national plans, including the Reuse Master Plan.	
9	**Final Report and Implementation Toolkit.** The Final Report shall consolidate all findings, recommendations and outputs of the assignment into a single document incorporating comments received during the review and validation process. The report shall include the final operational framework, technical specifications, model contractual documents, stakeholder engagement strategy, capacity-building recommendations and monitoring framework. All supporting tools, templates, datasets and technical annexes developed during the assignment shall be submitted as part of the final implementation toolkit to facilitate future application by the Water Authority of Jordan and partner institutions.	Month 12
Consultation and validation workshops		
10	**Stakeholder Consultation and Validation Workshops.** The Consultant shall organize and facilitate a minimum of five structured validation workshops: - one inception/diagnostic workshop, - one validation workshop for each of the three case studies, - and one national validation workshop on the draft Toolkit/final recommendations. The Consultant shall prepare materials in advance, record comments and decisions, and provide a response-to-comments matrix showing how feedback has been addressed. Additional technical meetings may be organized where required. Additional targeted technical meetings may be held as needed. Workshop materials, attendance records, minutes and response-to-comments matrices shall be submitted.	Month 2 Month 3 to 7 Month 11

4.2: Validation of the deliverables

All deliverables shall be submitted electronically in Microsoft Word and searchable PDF formats to AFD and the designated representatives of the Water Authority of Jordan. Draft reports shall be prepared in a format suitable for review, with supporting datasets, figures, maps and annexes provided where relevant.

Following submission, the Contracting Authority and the beneficiary institutions shall have up to ten (10) working days to review each deliverable and provide consolidated comments to the Consultant. The Consultant shall address all comments received and submit a revised version of the deliverable within ten (10) working days, unless otherwise agreed. To facilitate the review process, revised documents shall be submitted both as a clean version and as a version showing tracked changes.

Final acceptance of each deliverable shall be subject to written approval by AFD, in consultation with the Water Authority of Jordan. Validation of the final deliverables shall constitute confirmation that the contractual obligations associated with the corresponding phase of the assignment have been satisfactorily fulfilled and shall trigger the related payment in accordance with the provisions of the consultancy contract.

3. QUALIFICATIONS

5.1 Qualification of the team of consultants

The assignment requires a focused multidisciplinary team capable of delivering the operational Toolkit. Essential expertise shall cover water/reuse operations and institutional coordination, metering/instrumentation, agricultural water management and farmer engagement, and legal/contractual aspects. The Consultant may combine functions within appropriately qualified experts rather than proposing a large team.

The Consultant shall be responsible for assembling and managing the team necessary to successfully complete the assignment. The proposed team shall demonstrate proven experience in carrying out assignments of comparable scope and complexity, preferably in Jordan or the Middle East and North Africa (MENA) region. Previous experience working on projects financed by international development partners such as AFD, the World Bank, the European Union, GIZ, KfW, UN agencies or similar organizations will be considered an advantage.

For this assignment, the consultant is encouraged to strike a balance between the participation of international experts for international benchmarking and specific technical aspects, and the participation of national experts and institutions, in order to strengthen local ownership and facilitate stakeholder engagement. This will ensure that the proposed recommendations are firmly grounded in the Jordanian institutional and regulatory context.

Although the Consultant may propose an alternative team composition where justified, the team is expected to include expertise covering the disciplines described below.

In addition, the Consultant will identify a team leader (minimum 15 years of experience) whose main duties will be:

- Overall responsibility for direction of staff.
- Maintaining contact with client.
- Liaison with public authorities.
- Preparation and monitoring of work programs, planning schedules.
- Staff scheduling.
- Analysis of potential constraints and delays with identification of remedial measures to be taken.
- Responsible for quality of deliverables.

For all the expertise requested, the knowledge of the Jordanian context and proficiency in Arabic will be a strong added value (in addition to English).

(a) Area of Expertise 1: Team Leader / Water Reuse and Institutional Coordination Specialist

The Team Leader shall be responsible for the overall technical and administrative management of the assignment, ensuring the quality, consistency and timely delivery of all outputs. The Team Leader shall act as the principal point of contact with the Contracting Authority and beneficiary institutions, coordinate the multidisciplinary team, supervise quality assurance and facilitate communication among stakeholders throughout the assignment.

The Team Leader should possess at least fifteen (15) years of professional experience in water resources management, water sector governance or institutional reform, including substantial experience in wastewater management or water reuse. Demonstrated experience leading multidisciplinary consulting assignments financed by international development partners is highly desirable. Experience in Jordan or the MENA region, together with a sound understanding of institutional reforms and public sector governance, will constitute a significant advantage.

(b) Area of Expertise 2: Wastewater Reuse and Water Quality Specialist

The Wastewater Reuse Specialist shall lead the technical assessment of wastewater reuse practices, reclaimed water quality management and the suitability of existing operational arrangements. The expert shall evaluate the compatibility of different technical solutions with the physical, chemical and microbiological characteristics of reclaimed water and assess their compliance with applicable Jordanian standards and international guidelines.

The expert should possess at least ten (10) years of professional experience in wastewater treatment, reclaimed water management or environmental engineering, with demonstrated involvement in the planning, operation or evaluation of wastewater reuse schemes. Familiarity with WHO Guidelines on the Safe Use of Wastewater, Jordanian Standard JS 893 and international reuse standards will be considered an asset.

(c) Area of Expertise 3: Instrumentation and Metering Specialist

The Instrumentation Specialist shall assess existing metering technologies and develop recommendations for the selection, installation, operation and maintenance of flow measurement systems suitable for treated wastewater applications. The assessment shall include considerations related to instrumentation accuracy, operational reliability, energy requirements, remote monitoring, telemetry, digitalization and lifecycle costs.

The expert should have at least ten (10) years of experience in instrumentation engineering, hydraulic measurement systems, SCADA, telemetry or digital water management, including practical experience with flow measurement technologies under challenging operational conditions.

(d) Institutional and Governance functions shall be integrated into the Team Leader role, with additional short-term specialist input only where justified.

The Institutional Specialist shall analyze governance arrangements, institutional mandates, coordination mechanisms and operational responsibilities associated with direct wastewater reuse. The expert shall contribute to the preparation of institutional models defining the respective roles and responsibilities of WAJ, Water Companies, farmers and other stakeholders involved in wastewater reuse management.

The expert should possess at least ten (10) years of professional experience in institutional analysis, public sector reform, water governance or utility management, preferably within the water sector.

(e) Legal, Regulatory and Contractual Specialist – essential short-term expertise
The Legal Expert shall review the legislative and regulatory framework governing wastewater reuse in Jordan and assess its adequacy for supporting the expansion of direct reuse schemes. The expert shall identify regulatory gaps and propose recommendations for strengthening legislation, operational procedures and contractual arrangements.

The expert should possess a university degree in law together with at least ten (10) years of professional experience in environmental law, water legislation, public administration or regulatory reform. Familiarity with Jordanian water legislation and contractual frameworks applicable to public utilities will be highly desirable.

(f) Area of Expertise 6: Agricultural Water Management and Irrigation Specialist
The Agricultural Water Management Specialist shall assess irrigation practices, agricultural production systems, crop suitability, irrigation infrastructure and the integration of reclaimed water within existing farming systems. The expert shall evaluate opportunities for improving irrigation efficiency while maintaining agricultural productivity and environmental sustainability.

The expert should possess at least ten (10) years of experience in irrigation engineering, agricultural water management or agricultural development programس, preferably including experience with treated wastewater reuse.

The following functions may be provided as short-term or combined expertise, depending on the proposed methodology and budget:
Farmer Engagement and Stakeholder Specialist – short-term/combined function
The Social Development Specialist shall lead the socio-economic assessment and stakeholder engagement activities. The expert shall examine farmer perceptions, behavioral factors influencing reclaimed water acceptance, institutional trust, gender considerations, community participation and the role of Water User Associations in wastewater reuse management.

GIS and Data Management Specialist (Optional)
Depending on the proposed methodology, the Consultant may include a GIS and data management specialist responsible for mapping existing reuse schemes, analyzing spatial information and supporting the development of the national implementation roadmap through geospatial analysis and digital database management.

Junior Experts and National Specialists
The Consultant is encouraged to mobilize qualified national experts to support data collection, field investigations, stakeholder consultations and technical analyses. Junior professionals may also be included to strengthen knowledge transfer and capacity development throughout the assignment.

5.3 Additional considerations

The consultant will submit a curriculum vitae of no more than five pages. The CV should detail the Consultant's academic qualifications, experience, and previous assignments of a similar nature and/or related consultancy services.

The consultant cannot be from the administration of a beneficiary government. However, civil servants from a public institution/trust organization other than the beneficiary can be contracted if there is no hierarchical link between the expert and the beneficiary. A document from the official's administration giving his or her agreement for mobilization will be necessary.

Additionally, the consultant agrees to make available the experts mentioned in its proposal for the entire duration of the service, including scheduled working hours. The service contract will detail the conditions for replacing experts in the event of force majeure.

4. LOGISTICS AND CONTRACT EXECUTION SCHEDULE

6.1 Provisional Timeline

The indicative start date of the assignment is **December 2026**. The exact start date of the assignment will be determined by administrative order following the award of the contract.

The expected duration of the assignment is maximum **12 months**. The contractual duration will be 16 months.

6.2 Monitoring of the assignment

Project team

A Steering Committee, supported by a small technical coordination function, shall oversee the assignment and ensure alignment with sector strategies, existing/forthcoming master plans and the interests of the institutions responsible for water and agriculture. Relevant institutions will be identified to participate in the steering committee, including at least WAJ and the Ministry of Agriculture. Other institutions invited according based on needs and according to case studies. Its functions shall include strategic guidance, facilitation of inter-institutional coordination, review of key findings, validation of major deliverables and support for institutional ownership. The final composition shall be confirmed at inception. The committee shall also :

- Providing the consultant with all the human resources necessary for the proper execution of the assignment;
- Provide the logistics necessary for the proper execution of the assignment (meeting arrangements and introduction to key authorities, facilitation of the acquisition of all available data)
- Review and validate the deliverables of the assignment
- Comment and validate the deliverables of the assignment.

The members of the committee will be confirmed at the start of the assignment. Additional staff from the abovementioned institutions may also attend the committee's meeting on an ad-hoc basis.

Meetings

Kick-off meeting
Following the Contract signature, the Contracting Authority will arrange for the kick off meeting in order to:

- Introduce the Consultant's team to all the stakeholders and establish lines of communication between all.
- Make sure that the Consultant have a full understanding of the end user expectations.
- Review the project's key elements, requirements, issues and constraints.
- The Consultant shall prepare draft MoM and distribute to all attendees for comments. After the Contracting Authority's approval, final MoM shall be issued and incorporated as part of the Contract.

Ad Hoc progress and coordination meetings
The Consultant shall organize coordination meetings with parties concerned by the project when judged necessary by the consultant to present and get feedback on deliverables, as well as to report on difficulties and crucial updates that require thorough discussions and decision-making and with direct impact on the Contract, or when instructed by the contracting authority, and shall report to all concerned representatives.

5. CONTRACTUAL AND WORKING LANGUAGE

The language of the contractual documents will be English. The deliverables may be written in either Arabic or English. An executive summary in both languages will be provided for each deliverable.

6. BUDGET

8.1 Level of effort

The total level of effort shall be proposed by the Consultant based on the methodology. It is estimated at 150 man-days excluding the optional tranche. The financial proposal shall clearly distinguish the base scope from any optional training/study-visit activities.

8.2 Financial offer

The financial offer must cover all costs associated with the base assignment, including expert fees, travel, stakeholder consultations/workshops, field visits, pilot/demonstration support, materials, travel and accommodation. The Consultant shall provide a clear cost breakdown for the three case studies and the minimum five validation workshops. The cost of the basic metering for case study purpose (including purchase of meters as reimbursable expenses, but also the deployment of meters and their maintenance for a period of 6 month should be in a separate line. Optional items, including the full deployment of the meter in the selected areas and the additional training/study visits, shall be priced separately so that they can be included or excluded without restructuring the base offer.

7. ANNEXES

Related documentation and initiatives:

- National Water Master Plan (2022-2040)
- National wastewater reuse master plan (WEC/US Gov) – TOR released 2026[1]
- JVA master plan - design (FARA – MESC/US Gov) – TOR released 2026[2]
- Wastewater Reallocation plan for JVA in the North (WEC/US – done by Orient) – anticipating NCP additional water –2026
- National infrastructure Wastewater master plan 20250 (WGA/US) – 2026
- Surface Water Master Plan (WGA/US) – 2025, not released
- Management framework for wasterwater reuse from 4 WWTP in the North of the JV – for JVA (Orient) – released 2025
- Wastewater Management and Reuse Policy Jordanian Standard JS 893
- Northern Effluent Reuse System (North) – WAJ
- GIZ: Technical System Management (TSM) = audit systems for WWTP – includes standards compliance, effluent quality monitoring, sludge management - perception assessment
- Perception assessment for farmers in Madaba & South Amman – Environmental Impact Assessment (WES project - Sajdi) – 2023
- WEC Activity related documentation
- FAO field schools

[1] https://www.tendersa.com/TenderDetailsFree.aspx?tdc_id=1380599

[2] https://mwi.gov.jo/Ar/TendersDetails/Engineering_Services_for_the_Master_Plan_for_Water_Systems_in_the_Jordan_Valley_Including_an_Investment_Roadmap