

TERMS OF REFERENCE (TOR) FOR CONSULTANCY SERVICES FOR THE “INTEGRATED AND HARMONIZED MASTER PLAN FOR SANITATION SERVICES, WATER TRANSFER AND REUSE IN THE WEST BANK”

1. INTRODUCTION

1.1. Background

The Institutional Support Programme (ISP) assists the Palestinian Water Authority (PWA) "to fulfil its mandated as per the Water Law 2014 through strengthened and effective institutional capacities in the areas of strategic planning, policy formulation, coordination, monitoring, reporting, and resource mobilization.

Over three years, the intervention will contribute to putting an "effective institutional framework in place for improving water security and sustainable management of water and wastewater services in Palestine through a humanitarian-development-peace nexus approach.

The water sector receives support from various donors to facilitate essential infrastructure developments, considering the diverse range of contributors involved. The program aims to support further institutional development of the PWA.

Over the past decade, the water sector has undergone comprehensive reform, culminating in the adoption of a new Water Law in 2014. This law introduced a clear distinction between policy and regulatory functions, a departure from the PWA previous role encompassing both domains since its inception. Under the restructured framework, the PWA has taken on all ministerial functions, including policy and strategy formulation.

As per the Water Law (14) Article (8), the Palestinian Water Authority (PWA) is mandated amongst others to develop water policies, and strategies as well as preparation of sector strategic plans. Also, it is mandated to ensure integrated planning for water supply, wastewater, reuse, etc.

The PWA has developed the Palestine Water and Wastewater National strategy for water and wastewater 2012 -2032 that has been recently updated to be 2022- 2042.

In light of the above, in the last 15 years, the PWA has prepared master plans for water and wastewater for separate geographic areas in the West Bank for water and wastewater services. In 2024, a holistic master plan was prepared for the bulk water supply system in the West Bank.

The main prepared master plans and strategies related to wastewater and reuse are:

1. Hebron Governorate Water and Wastewater Master Plan dated 10/2024 prepared by JV Wee Pros, SECURECA, VEOLIA and SES financed by AFD and the EU.

2. Preparation of a Treated WW Reuse Strategy for the West Bank Dated 8/2022 prepared by JV HyrdoNova, PWEA and TIMESIS financed by Office of the Quartet
3. Sanitation Master Plan for the Service Area of Jerusalem Water Undertaking (JWU) dated 12/2019 prepared by JV Dorsch and UG financed by KfW.
4. Water And Sewerage Master Plan for the North and North-West Region of the West Bank dated 2/2027 prepared by JV GITEC, Sachsen Wasser and CEC financed by AfD and KfW.

Other studies and documents can be provided during the study, if deemed necessary and usable for the project.

The National Water and Wastewater Policy and Strategy for Palestine (2022-2042) dated 12/2024 is a main reference in this study, as well as, the latest water sector strategy 2025-2027.

The integrity of these master plans and their interconnections are to be examined, updated and integrated in one reference document and database as an enhanced decision making tool. Besides, all missing data and information related to the project's context shall be acquired and incorporated.

Moreover, as an initial in-house exercise, discontinuity at the fringe of the governorates/ areas has been noted, some of the used assumptions and design criteria are inconsistent, some of the identified gaps or updates at the time of preparing these studied are not valid due to changes on the ground, urbanization and people expansion. Some information is either incomplete or unavailable such as data for Jericho and Bethlehem governorates. Moreover, the produced outcomes of these master plans were not unified in a common platform such as GIS database or similar.

Under the ISP, the ADA and PWA tend to hire an experienced consultancy firm to generate a harmonized and develop one Master Plan for Sanitation service, water transfer and reuse in the West Bank. Moreover, clean energy opportunities shall be examined.

1.2. Status Quo of the Project Area

Currently, around 35% of the West Bank's population are connected to public sewer network. Working WWTP are 19 No. treating a total of about 10 MCM per year. Only 20% of the treated wastewater is being reused in irrigating.

The project should cover the whole West Bank as illustrated in Figure 1. As per data from the PCBS, the population of the West Bank in 2025 based on the 2017 census is estimated at 3.4 million capita including Jerusalem J1¹ and J2. Estimated population per governorates in 2025 is presented in Table 1. Considering the population growth rate used in the PCBS projections for the West Bank (regardless of the difference

¹ Jerusalem (J1) localities are: Kafr A'qab, Beit Hanina, Shu'fat Camp, Shu'fat, Al 'Isawiya, Sheikh Jarrah, Wadi al Joz, Bab as Sahira, As Suwwana, At Tur, Jerusalem (Al Quds), Ash Shayyah, Ras al A'mud, Silwan, Ath Thuri, Jabal al Mukabbir, As Sawahira al Gharbiya, Beit Safafa, Sharafat, Sur Bahir, Umm Tuba.

between governorates), the West Bank population in 2042 (reference year per the Strategy) would reach around 4.6 million capita.

The projected total demand in 2042 ² would reach around 290 MCM per year, which corresponds to around 200 MCM per year wastewater (assuming 80% coverage and 85% wastewater generation). Currently, the consumption in the West Bank is around 90.8 MCM that generates around 77.2 MCM wastewater³.

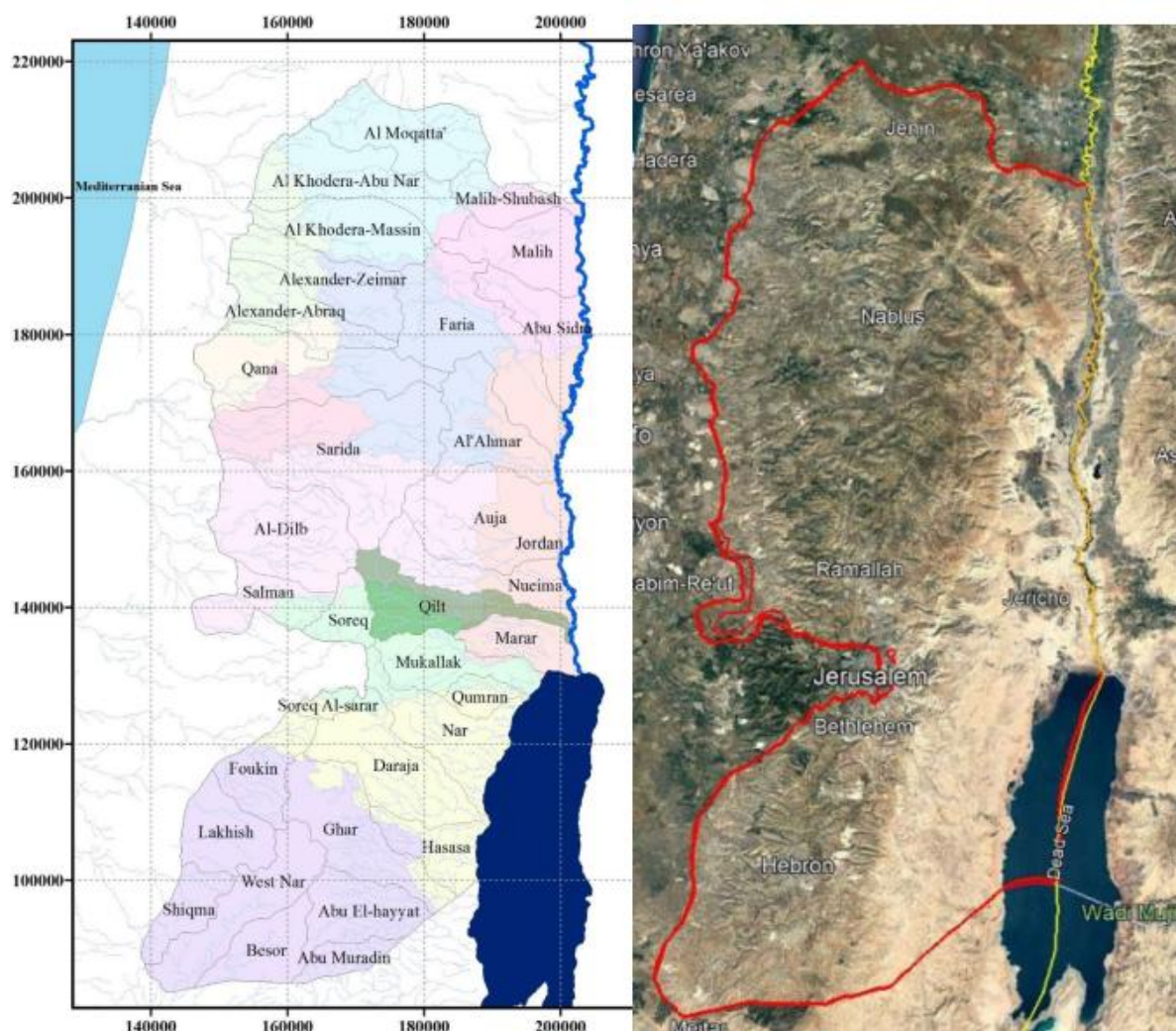


Figure 1 Project Area

Table 1 Estimated Population in 2025⁴

Governorate	Population in 2025
Jerusalem J1	330,965
Jerusalem J2	181,972
Hebron	863,797

² Reference : Bulk Water Supply Master Plan for the West Bank

³ Reference: Updated National Water and Wastewater Policy and Strategy for Palestine dated 12/2024

⁴ Reference: PCBS Projected Mid -Year Population 2017 -2026

Governorate	Population in 2025
Jericho	57,248
Nablus	447,695
Qalqilya	132,481
Tulkarem	213,049
Tubas	71,682
Salfeet	89,822
Ramallah and Al Bireh	384,903
Jenin	366,989
Bethlehem	254,657
Total	3,395,260

According to the Performance Monitoring Report for Water and Wastewater service providers for 2023 issued in 8/2024 by the Water Sector Regulatory council (WSRC), wastewater service coverage does not exceed the 35% of the West Bank population.

The updated National Water and Wastewater Policy and Strategy for Palestine dated 12/2024 (The Strategy), states that around 38% of the West Bank population are connected to a public sewer network. The remainder (around 52%) rely on percolation cesspit and tight septic tanks. More than 70% of the unconnected to public sewer systems are using percolation cesspit causing tremendous threat on the public health, water resources, and environment.

According to the Strategy, currently there are 19 functional wastewater treatment plants (WWTPs) in the West Bank, with a total treatment capacity of approximately 10 MCM/year. The majority of this amount is being disposed into Wadis and mixed with untreated wastewater and other pollutants. Only 2.3 MCM are being used in agriculture (23%). Served areas are around 2,000 donums.

The strategic goals of the PWA are to expand public sewer network coverage to 81% of the population by 2042; and increase treated wastewater reuse to around 25,000 donums in the West Bank and 65,000 donums at the national level.

An overview map of the existing and proposed sanitation services and reuse as per the available data are shown on the figure below.

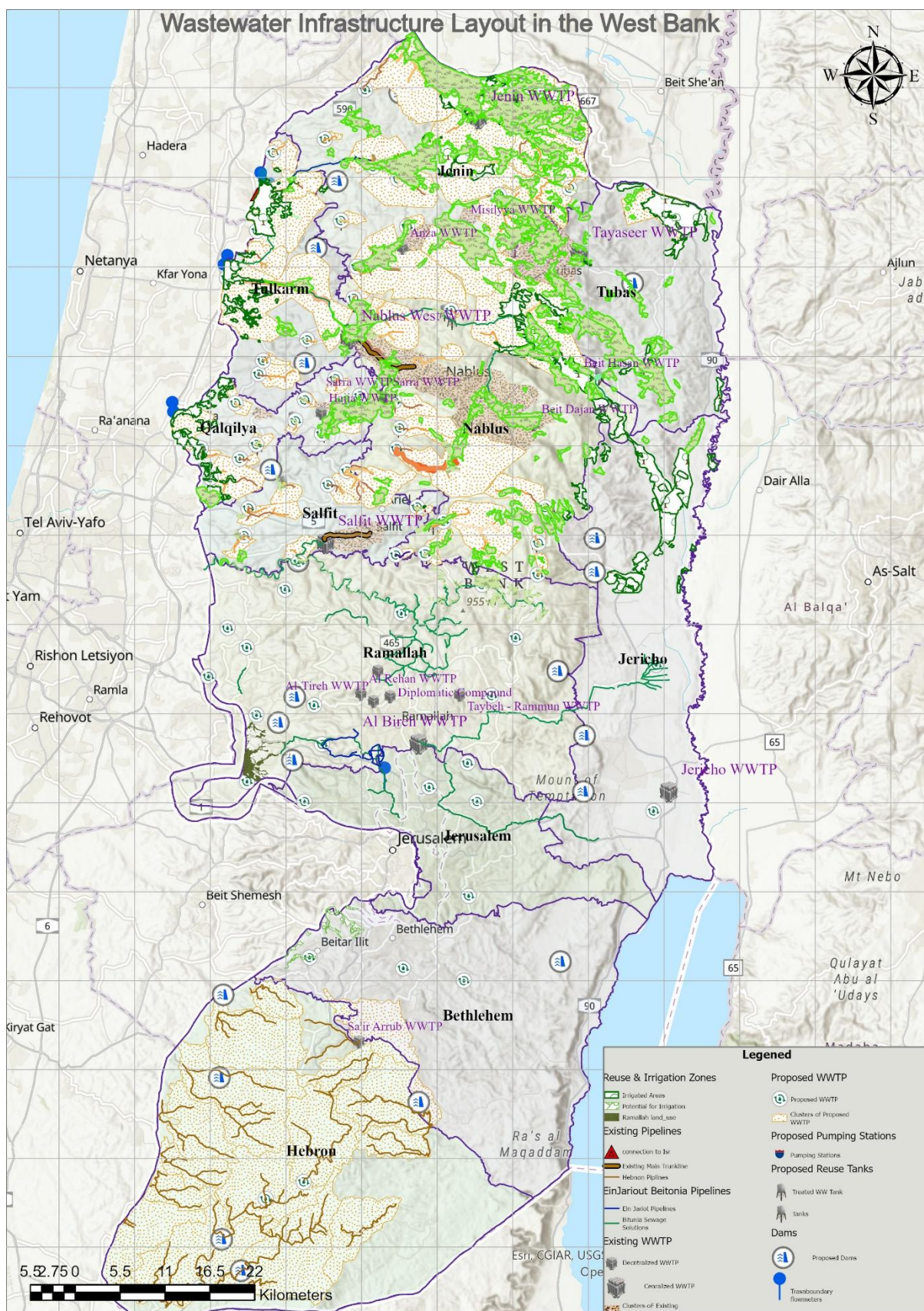


Figure 2 Overview Map of Sanitation Services and Reuse/Available Data

2. THE MAIN OBJECTIVE OF THE CONSULTANCY SERVICE

To generate a unified, integrated and up to date database for the current sanitation and reuse conditions in the West Bank and a comprehensive master plan that can be used as a decision making tool and base for future appraisals and fund raising.

3. SPECIFIC OBJECTIVES

The specific objectives of the consultancy services inter alia:

1. Integrate, assess, harmonize, update and unify the master plan for sanitation service and reuse in the West Bank including transfer of treated wastewater or untreated wastewater where applicable and technically feasible. The generated master plan should be used as the base and reference for any future studies, projects, and fund appraisals.
2. Recommendations to improve the sanitation services and reuse in the West Bank with well-defined priority projects to be implemented in the short and long term.
3. Set Measures and propose alternatives to reduce or eliminate transboundary wastewater with practical and realistic proposals.
4. Revised and Updated design criteria for wastewater collection, treatment and disposal/ reuse based on the available criteria with the PWA.
5. Update all existing wastewater assets, ongoing projects, proposed integrated interventions, investment costs, O&M costs, investment plans, prioritization matrixes, implementation plans for the coming 20 years, proposed required studies, proposed awareness campaigns, etc.
6. More emphasis on the required high priority investments for the coming 10 years
7. Integrate, verify and update wastewater, reuse and transfer systems GIS database or similar upon mutual agreement with the PWA with clear and detailed attributes.
8. Examining opportunities for producing clean energy through treated wastewater pipelines, using sludge to reduce treatment costs, or pumping treated wastewater to higher elevations.

4. SCOPE OF WORK

4.1. Main Activities

Below are the main foreseen activities, the Consultant shall in its proposal and schedule add any activities deemed necessary to achieve the main objectives of the study. Any activities believed to be necessary after the award of the contract shall not be a base for any claim.

4.1.1 Task 1: Data Collection and Review

The Consultant must familiarize himself with the situation within the catchment areas, including both urban and rural service levels and coverage/access to sewerage. The Consultant shall collect and review all previous master plans, feasibility studies, designs, related wastewater and reuse studies, GIS databases, drawings, etc. available at the PWA premises. This comprehensive review shall include verification of data accuracy and consistency. The Consultant shall identify any gaps or discrepancies or missing information in the available data and must be clearly documented. Proposal to bridge these gaps shall be provided in the inception report, and measures to bridge them such as meetings with stakeholders/ service providers/ regional utilities, operators, site visits, workshops, assumptions, etc.

Data related to existing system is linked to the trunks and main pumping stations only. Detailed data for the internal collection systems are not part of the inventory. The Consultant shall only indicate the communities as “served/ unserved or sewerage/ unsewerage” with the percentage of the existing collection system coverage.

4.1.2 Task 2: Updated Inventory Of The Status Quo Of Sanitation Services and Reuse

In light of the above Task, the Consultant shall conduct a comprehensive assessment and update of the status quo of sanitation services and reuse in the West Bank using the available data, studies and proposed measures to bridge the identified gaps in the available data. The Consultant shall:

- Conduct limited site visits to major facilities such as wastewater treatment plants (WWTP), reuse areas, and key service provider operational sites to validate and supplement existing data.
- Identify and document all existing centralized and decentralized sanitation infrastructure, including sewerage collection networks, treatment facilities, and sludge disposal methods.
- Assess the capacity, condition, and operational efficiency of wastewater collection and treatment systems, including their compliance with treatment standards and reuse practices. Also, assess the currently used treatment technologies in the West Bank, prepare a comparison and highlight the lesson learned.
- Map existing sanitation service coverage, highlighting communities served and unserved, and identify any hazard-prone areas linked to wastewater management.
- Evaluate the institutional and operational frameworks of service providers, detailing staffing, responsibilities, costs, and tariff structures.
- Incorporate analysis of stormwater and solid waste management where relevant to sanitation services.
- Include outcomes of consultations, meetings, and workshops with stakeholders and service providers to ensure alignment with local needs and priorities.

4.1.3 Task 3: Updated and Verified Existing GIS Database

Using the outcomes of the previous tasks, the Consultant shall update and verify the available GIS database/s and integrate them in one updated and verified GIS database that shall be the base for next tasks. The GIS database shall also include administrative boundaries, Zones A, B and C, topography, etc.

The updated GIS and Status Quo of the Sanitation Services and Reuse in the West Bank shall be submitted for review by the Client under a Status Quo Report.

4.1.4 Task 4: Review, Update and Harmonize the Design Criteria

Considering the previously prepared master plans, PWA guidelines, studies, etc., the Consultant shall prepare a detailed, comprehensive and harmonized design criteria that covers wastewater collection, treatment, reuse and other related facilities. The design criteria shall include but not limited to:

1. Population forecasts, demands, wastewater generation, etc. shall be studied and prepared in light of available data, PCBS data, and Palestinian Water Authority strategies and guidelines.
2. Physical and hydraulic design of gravity sewers and raising mains (e.g., material selection, velocities, pressures, slopes, chambers, manholes, etc.)
3. Design of pumping stations (e.g., selection of pumps (type and size), sizing of wet wells, electrical works, control, odour systems, etc.)
4. Design of WWTP (e.g., selection of process and treatment technologies depending on flow, size of WWTP and intended uses depending on the endorsed regulations and guidelines used in Palestine, financial and technical aspects, sizing of main components, control, sludge treatment and handling, etc.)
5. Design of Reuse Scheme (e.g., criteria to select potential reuse areas, reuse options (irrigation, industries, land application, etc.), etc.). Reduction of transboundary wastewater and maximising benefits from treated wastewater should be the driving criteria.
6. Design of hydroelectric power plants on transmission lines and power discharge into main networks

The harmonized Design Criteria should be submitted in a separate technical memo for agreement with the PWA before moving to the next tasks.

4.1.5 Task 5 Proposal of Interventions and Conceptual Design

In light of the previous tasks, the Consultant shall propose interventions to achieve the PWA strategy goals related to the wastewater services and reuse. The Consultant may benefit from the previously prepared master plans and studies. The interventions shall include but not limited to internal collection systems (tentative. No details are required), trunk sewers from the communities to the centralized or decentralized WWTPs. The WWTP could be existing or proposed. If connection is to existing WWTPs, required upgrading shall be highlighted. The interventions shall also include reuse scheme, proposed cropping patterns, potential reuse areas/ fields, required

tertiary treatment, treated wastewater transfers to potential reuse areas, proposed assets such as reservoirs, pumping stations, main transmission mains, in-farm assets (tentative – no details are required).

The Consultant shall generally estimate CAPEX and OPEX for all the proposed measures categorized by intervention, catchment, etc. The Consultant shall generate a unit rate per cubic meter of treated wastewater or per kilometre of network for both CAPEX and OPEX.

All interventions shall be designed at conceptual design level.

The outcomes of this task shall be presented in conceptual design report with all required drawings and databases. The database shall include information from Task 3 with shapefiles/layers/etc. for the proposed interventions.

4.1.6 Task 6: Harmonised Master Plan

The Consultant shall prepare a harmonized master plan for the sanitation services and reuse in the West Bank. The master plan should include but not limited to:

1. Global description of the existing and proposed interventions and their main components, location, capacities, new, replacement, upgrading, extension, rehabilitation/ refurbishment, etc.
2. Grouping of interventions in projects/ packages suitable for fund raising based on either catchment, service provider, regional utility, etc. These criteria shall be discussed with the PWA.
3. Prioritization of interventions as one of the essential tools in master planning. Prioritization criteria and weight shall be discussed and agreed with the PWA in advance. A technical memo could be submitted in advance for fast tracking. The Prioritization shall lead to ranking mechanism for the proposed interventions that facilitate decision making and fund raising for the future projects/ packages. Some of the prioritization criteria (for guidance only) would be political (A, B and C), reduction of transboundary flows, improve health and environment in the targeted areas, creation of income opportunities for women and youth in the targeted communities via reuse for instance, capacity and ability of the service provider/ utility to operate and maintain the assets, CAPEX and OPEX per m3 treated or kilometre of network, etc. The Consultant shall generate main criterion and sub-criterion and shall assign weight for each criterion and sub-criterion.
4. Review of the performed affordability studies and propose framework.
5. From the prioritization and ranking task, detailed phased implementation depending on size of intervention and capacities (e.g. Stage 1 and Stage 2 for WWTP and pumping stations) and investment plans for the short, medium and long term measures shall be developed. The phased implementation and investment plans shall be logical and realistic in terms of investments and functionality of the system.
6. Parelle to the investment plan, a recovery plan shall be generated assuming two scenarios (A) full recover (CAPEX and OPEX) and (B) recover of OPEX

only. The Consultant shall generate a unit cost for collection, treatment and reuse per cubic meter. Unit cost for tertiary treatment shall be included in the reuse unit cost.

7. Besides the proposed physical interventions, the Consultant shall propose required further studies/ designs, awareness campaigns, etc. and account for their costs in the CAPEX.

All shall be presented in a harmonised master plan report with all required tables, drawings, databases, etc.

4.2. Deliverables

Deliverables shall be presented in both hard and soft copies. All documents shall be in English and as comprehensive as possible avoiding lengthy textbook sections. Each volume shall be introduced by an executive summary consisting of no more than 10 pages. The reports will be submitted in four (4) coloured hard, and softcopies (editable PDF and Word). Maps and schematics included in reports must be easily readable. Where applicable, GIS databases shall be submitted in editable format. All softcopies shall be submitted in one folder tagged with the deliverable name, version (draft, final draft, final, etc.) and submission date.

Comments on the deliverables will be provided by the Client within two weeks from the date of submission for the Inception report and Harmonize the Desing Criteria. Within 4 weeks for others.

The expected deliverables and timelines are presented below:

Deliverable Name	Brief Description
Inception Report	Shall be submitted after 2.0 months from the commencement date. It shall include output of Task 1, updated working schedule, amendments to the methodology or clarifications, project organization and updated staffing schedule, reports, etc.
Status Quo Report	Draft shall be submitted after 4.0 months from the commencement date. It shall include the outcomes of Task 2 and 3 with the related GIS Database besides others deemed necessary. Detailed description of the conducted works to verify the status que, updates done on the database, description of the facilities, etc. shall be detailed in this report.
Harmonized Desing Criteria (Technical Memo)	Draft shall be submitted within 4.0 months from the commencement date detailing the proposed design criteria.

Deliverable Name	Brief Description
	Final version shall be submitted as part of the Conceptual Design Report after agreeing on and incorporating all comments.
Conceptual Design Report	Draft shall be submitted within 7.0 months from the commencement date. It shall detail the outputs of Task 5 with detailed description of the proposed interventions and their components. The report shall be accompanied by detailed drawings, databases, tables, etc. The report shall include Final Version shall be submitted within 9.0 months from the commencement date.
Harmonised Master Plan	Draft Master Plan shall be submitted within 10.00 months from the commencement date. The report shall detail the output of Task 6 including a brief of the conceptual design report. The final master plan and final database shall be submitted by the end of month 12 of this assignment.

Deliverable Name	1	2	3	4	5	6	7	8	9	10	11	12
Inception Report												
Review												
Status Quo Report												
Review												
Harmonize the Desing Criteria												
Review												
Draft Conceptual Desing Report												
Review												
Final Conceptual Desing Report												
Draft Harmonised Master Plan												
Review												
Final Harmonised Master Plan												

Note: Indicative and not binding. The Consultant shall prepare its own schedule

4.3. Duration of the Assignment

The assignment shall be concluded within 12 months starting from the commencement date addressed in the PWA letter to proceed.

4.4. Firm's Qualifications

The Firm shall be classified in the field of water and wastewater with minimum years of 15 years working in the field. The firm shall provide evidence that it had performed successfully at least on Master Plan in the field in the last 15 years besides large-scale water and wastewater design studies, feasibility studies, etc. Firms may submit their proposal in joint venture/ association to enhance their qualifications. At least the lead Consultant shall meet the above minimum requirements.

4.5. Staffing

4.5.1 Minimum Qualifications

The firm shall provide the below minimum staffing. Other additional staff deemed essential to perform the services shall be provided in the proposal. If during the performance of the assignment, additional staff are required, they shall be provided without any additional costs.

The firm is encouraged to propose local experienced staff. The key staff shall be available on-site for not less than the half of their inputs except the Project Manager who shall be available on-site for the majority of his input (at least 75%).

At least the key staff shall have an excellent knowledge of oral and written English.

Position		Qualifications
Key Staff		
K-1	Project Manager (Wastewater)	1. Minimum Bachelor degree in civil engineering (Masters preferred) 2. Minimum 15 years of total experience 3. Minimum 10 years actual experience in the in design and planning of wastewater systems, treatment and reuse. 4. At least worked in the preparation of master plans, pre-feasibility and feasibility studies (minimum 3 projects) 5. A least 5 years' experience as a Project Manager/ Team Leader
K-2	Sanitation Expert	1. Minimum Bachelor degree in civil engineering 2. Minimum 15 years of total experience 3. Minimum 10 years actual experience in the design and planning of wastewater and water systems, preparation of pre-feasibility, feasibility studies and at least conceptual designs.

Position		Qualifications
K-3	Process Engineer	1. Minimum Bachelor or Master degree in Sanitation engineering/ Civil engineering/ environmental engineering/ Process Design 2. Minimum 15 years of total experience 3. Minimum 5 years actual experience in the design and planning of wastewater treatment plants. 4. Worked at least in three design projects of wastewater treatment plants.
K-4	Irrigation/ Reuse Expert	1. Minimum Bachelor degree in irrigation or water engineering 2. Minimum of 15 years' total experience 3. Minimum of 5 years in the field of treated wastewater reuse and/ or irrigation. 4. Experience in at least 3 similar projects in irrigation and wastewater reuse 5. Experience in at least two master plans/ prefeasibility studies in the field of treated wastewater reuse.
K-5	Financial Expert/ Economist	1. Minimum bachelor degree in economics, public finance, or business administration or related fields 2. Experience in working as financial analyst / economist in the implementation of at least two projects in the field of water and/or wastewater projects and/or studies; 3. Experience in at least two projects with project-based financial modelling, Cost Benefit Analysis, determining NPV, FIRR, EIRR of investment costs and setting tariffs in the water / wastewater sector;
Non-key Staff		
N-1	Mechanical Engineer	1. Minimum Bachelor degree in Mechanical or Electromechanical engineering 2. At least 10 years' total experience with at least 3 years' experience in water and wastewater systems.
N-2	Electrical Engineer	1. Minimum Bachelor degree in Electrical or Electromechanical engineering 2. At least 10 years' total experience with at least 3 years' experience in water and wastewater systems.
N-3	Hydraulic Engineer	1. Minimum Bachelor degree in civil engineering or water engineering 2. At least 10 years' total experience. 3. Minimum 5 years' experience in the design of pipe networks, sewer systems hydraulic analyses and modelling (water modelling could be also considered but not preferred).

Position		Qualifications
N-4	GIS Engineer	1. Minimum Bachelor degree in civil engineering or GIS 2. At least 7 years' total experience with experience in handling complex GIS databases (analyses and creation)

4.5.2 Expected Inputs

The assignment is around 12 months in total including review periods. The minimum expected inputs are presented below. If additional inputs from the key or non-key staff are required to fulfil the Consultant's obligations under this terms of reference shall not be a base for any additional cost.

Position		Minimum Input (months)
Key Staff		
K-1	Project Manager (Wastewater - International)	9
K-2	Sanitation Expert	6
K-3	Process Engineer	3
K-4	Irrigation/ Reuse Expert	3
K-5	Financial Expert/ Economist	2
Non-key Staff		
N-1	Mechanical Engineer	1.5
N-2	Electrical Engineer	1.5
N-3	Hydraulic Engineer	5
N-4	GIS Engineer	5
	Total	36

The Consultant shall prepare staff mobilization schedule linked to the deliverables and tasks. The total input of each expert/ personnel per task and deliverable shall be clearly indicated.

4.6. Evaluation Criteria

The proposal will be evaluated based on the Quality and Cost Based Selection (QCBS) method.

- 80% for Technical Proposal
- 20% for Financial Proposal

The technical evaluation will be evaluated based on:

1. 15% for relevant experience and proven track record in similar projects in terms of scope, size, and complexity.
2. 50% for the quality and adequacy of the proposed methodology, and work plan in responding to the Terms of Reference (ToRs). Weights are:
 - 80% for the methodology quality, structure, sequence of tasks, technical approach and solutions to achieve the goals of the tasks, innovative methodologies, tackling of risks, etc.
 - 20% for the details, logic and coverage of the work plan for all tasks

3. 35% for the qualifications of the key personnel. Weights are:
- Academic qualifications 5%
 - General Experience 25%
 - Relevant experience 70%

4.7. Payment Schedule

Deliverable Name	Payment %
Submission and approval of Inception Report	10%
Submission and approval of the Status Quo Report	15%
Submission and approval of the Harmonized Design Criteria	0%
Submission and approval of the final Conceptual Design Report	30%
Submission and approval of the final Harmonised Master Plan with the submission of all paper and soft copies (editable word, excel, etc.) as per contract including all databases, shapefiles, CAD, etc will arrange in agreed structure with the client.	45%