



**REPUBLIC OF MOZAMBIQUE
MINISTRY OF PUBLIC WORKS, HOUSING AND WATER RESOURCES**



**WATER SERVICES AND INSTITUTIONAL SUPPORT PROJECT II
(WASIS II)**

IDA Grant No. D110

**FEASIBILITY STUDY AND DETAILED DESIGN FOR ADDITIONAL
INTAKE, WATER TREATMENT PLANT AND TRANSMISSION MAIN
FOR WATER SUPPLY TETE AND MOATIZE MUNICIPALITIES**

Contract Nr. FIPAG/WASIS II/CON- 67/22

TERMS OF REFERENCE

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1 BACKGROUND

1.1 General

The Republic of Mozambique has applied for a grant from the International Development Association toward the cost of the **Water Services and Institutional Support Project II (WASIS II)**, and it intends to apply part of the proceeds of this amount grant to payments under the Contract for **Feasibility study and detailed design for additional intake, water treatment plant and transmission main for water supply to Tete and Moatize Municipalities**.

The Government of Mozambique (GoM) is implementing reforms in the urban water supply sector aimed at improving coverage, quality and efficiency of services. The reform program has involved the reorganisation of sector Governance mechanisms, which have facilitated a transition towards decentralised water supply operations and management, including service regulation, investment planning, and private sector participation in operations.

More specifically, the GoM has taken steps aim to:

- Reduced operating costs and increased efficiency, particularly through involving private sector in operations for water supply services in 21 major cities; Maputo, Matola, Boane, Beira, Quelimane, Nampula, Pemba, Dondo, Chokwe, Xai-Xai, Inhambane, Maxixe, Tete, Moatize, Chimoio, Manica, Gondola, Lichinga, Cuamba, Angoche and Nacala;
- Tariff adjustments that support financial sustainability; and
- Establishment of a Regulatory Board for the sector, which considers both service quality and financial performance.

The program for urban water supply also includes investments in rehabilitation and extension of systems. The GoM's implementation agency for the new urban water program is **Fundo de Investimento e Património do Abastecimento de Água**– FIPAG (Investment Fund and Water Supply Asset Holder).

FIPAG is responsible for the fixed assets of the city water supplies and for the future investment in the systems. It has the mandate to ensure that the public receives an adequate and safe water supply that meets Mozambique standards for health and hygiene (the public service obligation), and is empowered to ensure these systems achieve autonomous, efficient and financially sustainable water supply operations.

The WASISII Project is to support FIPAG in implementing investments in the water supply system in 5 Cities, including Beira and Dondo. The investments aim to expand coverage and improve the quality of services for the city population, stimulating the economic growth and development in the region and strengthen institutional capacity and regulatory frameworks for water supply services in the Regional water utilities in the North and Central Regions of the Country.

1.2 Tete and Moatize

Tete city is the capital of Tete province. It is divided by both margins of Zambeze River, with of the right side called the Old Tete (Tete antiga) and the left called the Matundo-Chingodzi. The city has its boundaries in South-East with Quiro River, in East with Revubue and Mupuno Rivers, and South and North-East with Zambeze river. Tete is crossed by one of backbones of national road in Mozambique, which links between harbours of Beira and Nacala with hinterland countries

of Malawi and Zambia. Population of Tete city is 428,797 (INE, 2017). At the present 71% of population has access to water.

Moatize town is located around 20km North-East of Tete city along a branch of the Revubue River. The town has a population of 68,128. Currently 82% of population is supplied by the existing water supply system which source is from groundwater. The town is known for its mining projects. From this town a railway links Malawi to the seaport at Nacala coal terminal.

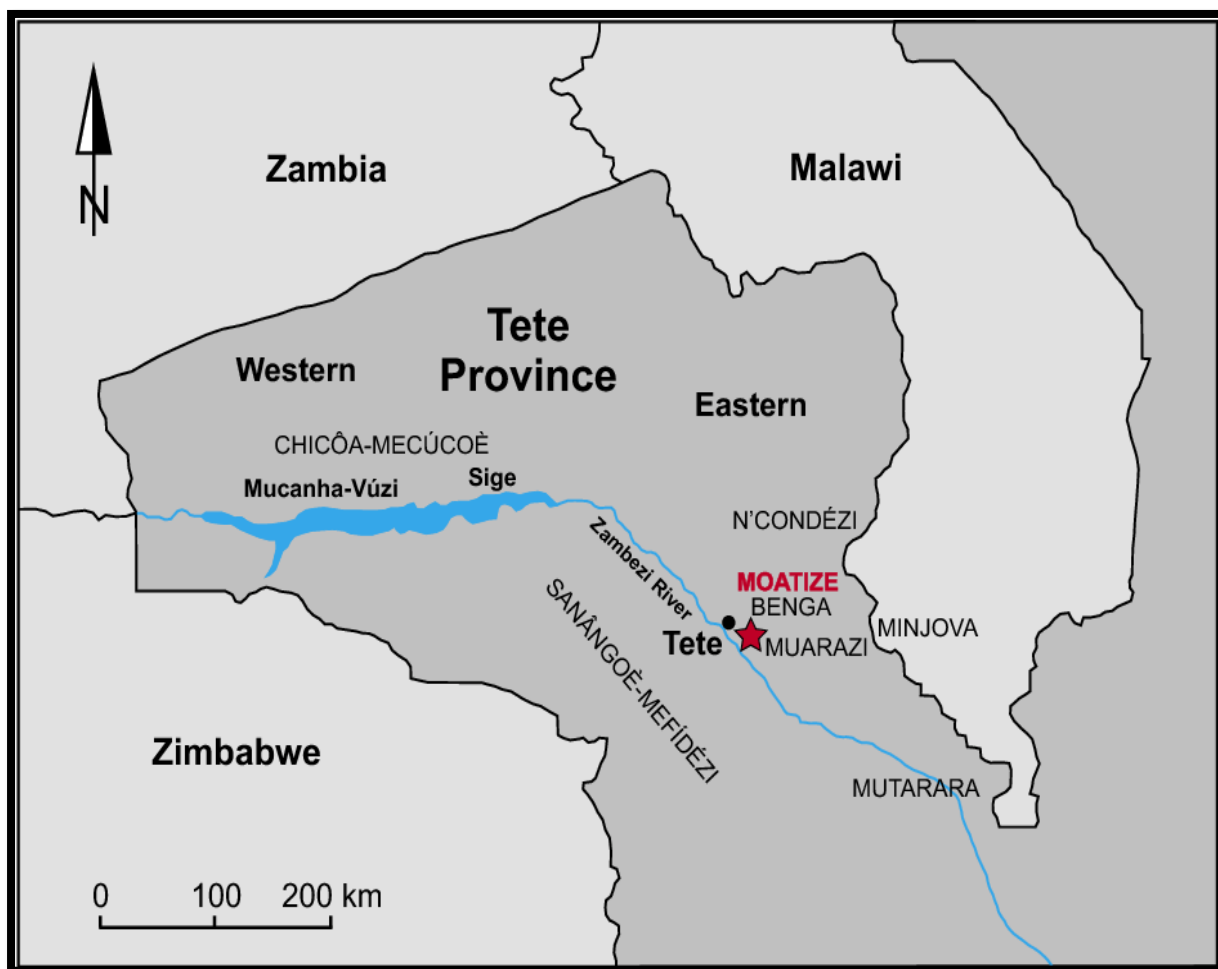


Figure 1: Project location

2 TETE AND MOATIZE WATER SUPPLY

2.1 Tete Water Supply System

The city of Tete is supplied by two separated water systems, each on different side of Zambeze river. The main system is in the old part of the city, known as Tete Antiga and the other system is on the expansion zone of the city in opposite side of the Zambeze river, also known as Mantundo-Chingodzi.

2.1.1 Tete Antiga

Groundwater infiltrating from the Zambezi River is abstracted through boreholes in the Nhartanda valley. The boreholes are equipped with submersible pumps. The raw water is transported through a 500m diameter pipeline over a distance of approximately 1.0 km to water treatment plant (WTP).

The treatment process consists of aeration in two tanks for removal of iron and then rapid filtration through four sand filters. The water is chlorinated before it enters the treated water reservoirs. From WTP water is transported to the distribution centre located at same area of WTP, which consist of 4 ground level reservoirs of 500m³ each, as well as an elevated tower of 150 m³. A 400mm transmission main distributes water from the ground reservoir and a 300mm connects the elevated tower to the network.

Through 300m transmission main the water is transported from Nhartanda valley to additional two 1000m³ distribution reservoirs, located in Sansão Muthemba and Samora Machel. The total water supply network consists of approximately 175 km of pipes.

2.1.2 Tete Matundo - Chingodzi

The source water supply to Chingodzi is groundwater where 15 boreholes pump water from the aquifer. It is located along the Rovubué River. The combined capacity of the wells is around 600m³/h which supplies to Matema distribution centre (DC) through two transmission mains, one 400mm GI pipeline and other 315mm PVC.

The Matema DC consists of two 500m³ ground reservoirs and one 140m³ elevated tank which supply water to a network of approximately 168km.

The two sub-systems, described above have 38,132 active connections that include domestic, industrial, commercial and 125 stand posts.

2.1.3 Moatize Water Supply System

Likewise Tete Antiga and Tete Chingodzi, Moatize is supplied from groundwater abstracted from banks of Robuvué river. The wellfield is located some 3.5km west of the town of Moatize. The existing 9 boreholes produce approximately 250 m³/day, pumped through a 300mm ductile iron and a 250mm PVC pipeline to the Distribution Centre, called 25 de Setembro, which consists of two ground reservoirs with a total of 1750m³ and an elevated tower of 120m³.

From the 25 de Setembro DC, water is supplied to surrounding neighbourhoods and to four distribution reservoirs: (i) Relé which consists on a ground water reservoir of 900m³ capacity and pumping station that in turn supply water to (ii) Casa 15 DC consisting of a ground water reservoir of 900m³; (iii) Cruzeiro which consists of a ground reservoir of 700m³ capacity and (iv) CFM which consists of a water tower with 50m³ capacity. From these DCs water is distributed to the network.

The distribution network consists of approximately 104km, with 7,952 active domestic, industrial and commercial connections and 56 public standposts.

2.2 Tete and Moatize Water Demand

The combined population of Tete and Moatize is 340,943 inhabitants, (INE 2017).

At present, 252,292 people have access to safe drinking water from a network of around 260km and 34,659 active connections and 125 standposts.

The current demand is estimated at 50,611m³/d, substantially more than the present available supply. In order to address the current limitations of the existing water source to meet the present and future demand, there is a need for of alternative source.

The table below depicts water demand for Tete and Moatize for next 20 years.

Table 1 – Projected water demand

Description	Demand - (m ³ /day)		
	2021	2030	2040
Population	547,260	826,474	1,186,828
Domestic Demand	37,214	56,200	80,704
Commercial Demand	372	562	807
Industrial Demand	5,582	8,430	12,106
Estimated Losses	7,443	11,240	16,141
Total Demand	50,611	76,432	109,758

From the above table it became apparent that the present systems are by far not sufficient to meet the current demand and it shall be augmented substantially, in near the future. Additional water sources are urgently required to meet the Government's target of 80% coverage by 2024 and universal coverage target by 2030.

2.3 Water Resources for Tete and Moatize

Currently both cities are supplied from underground water with 35 boreholes in Tete and 9 in Moatize, abstracting 1350m³/d and 250m³/d, from wellfields of Nhartanda, and Revubue, respectively.

In regions of Tete and Moatize, the soils are predominantly rocky arid and holomorphic from sedimentary rocky. These conditions do not enable superficial runoff and storage capacity of aquifer.

Annual rainfall in Tete is, in average, 636.66mm and it is uneven throughout the year with maximum occurring in January (160mm), during the hot season and minimum in August (1.4mm).

Tete is deemed as the hottest province in Mozambique with average temperature of 27.2o C., reaching 40 degrees in January. Due to high temperatures, the evapotranspiration exceeds annual rainfall, therefore it has water deficit.

According to the Geological Map of Mozambique, Tete and Moatize regions are characterised by scarcity of groundwater resource, due to high evapotranspiration.

Therefore, the existing wellfields do not have enough capacity to meet the present demand and by far less for the future water demand and new water source is needed.

The Zambeze River is a unique reliable source on permanent basis to supply water to Tete and Moatize cities.

3 OBJECTIVES

The objective of this assignment is to develop a Feasibility study and detailed design for additional intake from Zambeze River, water treatment plant, transmission main to connect existing water supply of Tete City and Moatize town, as well as distribution network for expansion of water supply access in Tete and Moatize Municipalities. The feasibility study shall determine the technical and economic feasibility of construction of above-mentioned infrastructures, taking into account environmental and social aspects.

The specific objectives of the consultancy are:

- To enable the construction of additional Intake on Zambeze River, water treatment plant and installation of transmission main connecting to existing water supply of Tete city and Moatize town, aiming at expanding of water supply to two urban centres.
- To assess the likelihood of environmental, social public health and gender impacts, and through a process of iterative design, to minimize such impacts and define the accompanying mitigation measures;
- To provide a basis for the long term development of sustainable water supply systems in the two cities;
- To prepare, environmental, social and public health studies, in conducting gender-balanced public consultation, and in obtaining environmental regulatory approvals for all component works in the two urban centres.
- To assess and design a structure for crossing the existing pipeline through Rivubue River.

4 CONSULTANT SERVICES PHASES

The Consultant shall be required to carry out assignment in two (2) distinctive phases, as follows:

4.1 Phase 1: Feasibility Study

This phase aims to carry out the feasibility study for the construction of intake on Zambeze River, water treatment plant and transmission main, which will connect to existing water supply of both cities.

The feasibility study is intended to justify the project's viability from a financial, technical, economic, environmental and social standpoint, following an iterative design carried out jointly by the project environmentalist and engineer in a collaborative fashion. In this way, adverse impacts are anticipated and addressed as early as possible in the design phase, thus minimizing mitigation at a later stage.

There are three primary objectives to this feasibility study:

- the determination of the economic and financial feasibility of the project when measured against a predetermined threshold economic internal rate of return;
- the assessment of its likely environmental impact; and
- Recommendation of the most favourable alternative from a range of options taking into consideration environmental and social impacts and associated measures to minimize or mitigate impacts.

Relating to the assessment of environmental and social impacts, the Consultant shall support FIPAG in preparing environmental and social studies and supporting materials, in conducting public consultation, and in obtaining regulatory approvals for the water project development, to meet Environment and Social Assessments requirements of Mozambique. This shall include preparing a draft Environmental Impact Report for the project, and environmental and social assessments as required by environmental regulatory authorities.

4.2 Phase 2: Detailed Design

This phase aims to develop the detailed design for Intake on Zambeze River, water treatment plant and transmission main option recommended in Phase 1 and full a set of construction

drawings. The contract for this phase will be awarded on the discretion of FIPAG, based on the good performance of the Consultant in phase 1.

5 SCOPE PHASE 1 ACTIVITIES

The scope of Phase 1 activities is split into Phase 1 A and Phase A 2 as listed below:

5.1 Phase 1 A

Under Phase 1 A the following activities are required:

- Basic Data and Criteria. The Consultant shall collect and review data relating to the water supply sector relevant for the study, from existing reports, studies and other documents. In addition, the Consultant shall assess ongoing or planned efforts by FIPAG, international funding agencies, related to water supply. The purpose shall be to establish an information base for the conduct of the study and to determine, in consultation with the Client, the requirements for field data collection and investigations. The Consultant shall establish criteria and standards to be used during the study and obtain clearance from FIPAG before proceeding to use these criteria. The criteria and standards shall include those required for decisions regarding evaluations of options, selection of priorities, sizing and specifications in preliminary and final designs.
- Water Resources Assessment. The Consultant shall assemble available information on Zambeze River, identify shortcomings. The Water Resources Study will aiming at matching the supply for the present and future development of the cities in view of quantity and quality of Zambeze River; their spatial and temporal distribution; and technological options for development with cost estimates.
- Water Demand Forecast. The Consultant shall prepare a forecast of water demand in two urban centres up to 2040.
- Topographic Surveys and Mapping. The Consultant shall Map the present and possible future land use patterns and undertake topographic surveys to complement the existing mapping data of the service areas and transmission main alignment, adequate for the depiction of the existing systems and the location of alternative schemes of Intake and WTP.
- Initial Planning of the Project. The Consultant shall assess all existing works; identify alternative schemes for construction of Intake on Zambeze River, Water Treatment Plant and Transmission main, to create a short list of realistically feasible options.
- Preliminary Environmental and Social Impact Assessment. The Consultant shall undertake scoping studies and identify environmental, social, public health, gender and resettlement issues related to specific options. This assessment will lay the foundation for Resettlement Framework, if required. The Consultant shall also prepare materials and documents required to comply with all applicable Mozambican environmental law and regulations.
- Planning Criteria. The Consultant shall define the planning criteria to be used in the preparation of the Feasibility Study.

The Consultant shall present this work in a Phase 1 A Report.

5.2 Phase 1 B

Under Phase 1 B the following activities are required:

- Water Supply Field Investigations. The Consultant shall undertake more detailed investigations necessary for the evaluation of Zambeze River the short listed alternatives and preparation of the recommended options of Intake, including water quality and treatment approaches.

Environmental and Social Impact Assessments. The Consultant shall prepare environmental and social impact evaluation for each of the short listed options of construction of Intake on Zambeze river, WTP and Transmission Main connecting to the existing water supply schemes. These will include a statement of the public health and gender impacts of proposed options and a resettlement framework consistent with the Involuntary Resettlement and Mozambican Environmental Guidelines. Women and vulnerable groups need to be clearly represented in the ESIA process, including consultation, scoping, impact assessment and mitigation as well as the resettlement planning process. As part of the environment and social assessment process, the Consultant shall also prepare an Environmental and Social Impact Report, a generic Environmental Management Plan (EMP) to avoid, reduce or compensate addressing adverse impacts or enhance positive impacts.

Financial and Socio-Economic Analysis. The Consultant shall undertake financial and socio-economic analyses for each of the alternative short-listed to determine the optimum option and indicate which are sustainable in terms of a achieving proper balance between estimated operation & maintenance costs. The result will be a life-cycle analysis of each alternative through the ultimate planning year 2040.

- Technical Feasibility Study. The Consultant shall prepare a feasibility study, which identifies the optimum sustainable option of construction of Intake on Zambeze river, WTP and Transmission Main connecting to the existing water supply schemes to meet the water demand in two urban centres the planning period of 2022 through the year 2040.
- Implementation Plan. The Consultant shall define activities and its timeline of implementation, prepare outline designs for these works and provide an estimate of their cost. On the Environmental and Social Management Plan document, the Consultant shall propose tasks to be implemented, and identify the extent of resettlement required for construction of the new works, mitigation measures; and the appropriate resettlement-planning instrument for preparation during the detailed design stage.

5.3 Outcome of Phase 1

The outcome of the phase 1 consultancy shall be:

A feasibility study that identifies the optimum option for construction of Intake on Zambeze River, WTP and Transmission Main connecting to the existing water supply of the two cities to achieve the above objectives.

5.3.1 Investigations and Survey Scope of Work

The Consultant is responsible for the sufficiency of his/her work and this TOR are not intended to be an exhaustive list of all activities, but to indicate the level of work required for the outputs. Although the work is divided into various elements, the Consultant shall ensure that it forms a holistic, integrated study resulting in sustainable outputs.

Following proper environmental and social scoping but before detailed ESIA, iterative design methodology of the proposals must be worked out by the project environmentalist, social expert and engineer in conjunction. In this way adverse impacts are designed out as far as possible rather than leaving them to be mitigated at a later stage.

In order for project to proceed to construction it is necessary to obtain an environmental license from the Ministry of Land and Environmental Affairs. The Consultant is responsible for ensuring that the Client is provided with all necessary documents for submission to Ministry of Environment to expedite receipt of approvals, and that stakeholder consultation is carried out in accordance with the current legislation covering environmental licensing.

5.3.2 *Topographic Surveys and Mapping*

To provide a solid graphical basis for understanding the existing water supply, systems and to define the location and characteristics of proposed infrastructures, the Consultant shall undertake such topographic surveys and prepare mapping during Phase 1 A that is adequate for the presentation of outline designs for the proposed works to be constructed and include the following:

- Aerial at a large-scale maps that show the cities, the location of Intake on Zambeze River, Water Treatment Plant and Transmission Main route to connect existing water supply schemes of the two cities, including land use, major land features, environmentally sensitive areas and population densities;
- Prepare large-scale layout maps of each city that show the water scheme, vis-à-vis reservoirs, primary distribution systems (key points in the water distribution system), the city boundary and the Cement City boundary. The elevation of all key points shall be determined to $\pm 5\text{m}$ using GPS or other suitable method;
- Conduct GPS type ground surveys within each city boundary. The accuracy of these maps shall be determined to $\pm 1\text{m}$ (*through the use of GPS*) and can use existing maps and other sources but the elevation of all key points shall be confirmed with GPS.

The Consultant shall prepare layout drawings which shows:

- The location of the principal water facilities (treatment facilities, pumping stations, reservoirs, etc.);
- Identify the location of connection point the size of all principal water transmission lines.

For the two urban centres, an updated layout plans of the existing water supply systems are available.

5.3.3 *Environmental and Social Impact Assessment and Licensing Requirements*

This shall include preparing a Draft Environmental and Social Impact Report (ESIAR) to be delivered in Phase 1 and Final ESIAR, Environmental Management Plans and a Resettlement Framework to be delivered in Phase 2.

Whilst there are no requirements within GoM legislation and regulations for an assessment of health impacts to be included in Environmental and Social Impact Assessment Reports (ESIAR) or Simplified Environmental and Social Reports (SESR), there is a need to assess public health impacts adequately. The GoM recognizes the relationships between good public health and sustainable economic growth, and both state an intention to ensure that their investments do not cause public health hazards.

Objectives of the Feasibility Study for Environmental and Social Impact Assessment (ESIA) activities are:

1. To develop and summarize information and reports of a quality and format suitable for environmental authorities of Mozambique to expeditiously review the project and

establish environmental requirements, in compliance with Decree Number 45/2004 and General Directive Number 129/2006 of the GoM.

2. To assure close communication and coordination of the project with environmental regulatory authorities regarding environmental requirements, submittals and approvals.
3. To develop and implement a public participation and consultation plan as part of the environmental assessment process, in compliance with General Directive 130/2006 of the GoM. All consultation processes shall be gender balanced as possible.
4. To prepare draft environmental and social assessments for individual project components, as required by environmental regulatory authorities. These will include assessments of the public health, hygiene and gender impacts of individual investments.

5.3.4 Environmental Social Impact Analysis Activities

5.3.4.1 Convene public consultation

The Consultant shall identify stakeholders to be invited for two Scoping Sessions, one in Maputo and the other in Tete City, and, upon approval by FIPAG, shall invite the stakeholders.

The Scoping Sessions shall inform stakeholders of the overall parameters of the proposed project and public participation and solicit comment on the associated environmental and social impacts. The Consultant shall prepare a detailed agenda, information and presentation materials for the Scoping Session, convene the Scoping Session, facilitate the session, and prepare a report summarizing the results of the session, for FIPAG review and approval. Stakeholders should include representatives from provincial and district authorities responsible for public health and hygiene.

The sub-task deliverable is a log of comments with necessary follow up steps and summary of Scoping Session results in a separate Public Consultation report as per legal requirements to accompany the EIR.

5.3.4.2 Scoping Document

Based on the results of the Scoping Sessions, the Consultant shall prepare a Scoping Document that summarizes the Consultant's proposed plans for preparing the Environmental and Social Impact Report, including at a minimum:

1. Definition of each option to be assessed.
2. Alternatives to each component of the project to be assessed.
3. Physical, environmental and socio-economic factors to be assessed in accordance with GoM guidelines (Ministerial Diploma 130/2006).
4. Plan for assessing each of the physical, environmental and socioeconomic factors in each city. This will include a definition of studies and focused environmental/socio-economic assessment. Prepare Environmental Pre-feasibility Report and Scoping Study (EPDA)

As required by Ministry of Environment after categorization, the Consultant shall prepare an EPDA, in accordance with and form, specified in GoM Decree Number 45/2004, which provides sufficient information for the environmental regulatory authority to make final decisions regarding the appropriate level of environmental assessments and other studies required for project. The EPDA and the Scoping Document will reflect each other.

The report of EPDA shall be in Portuguese and English as compliant with Decree Number 45/2004, General Directive Numbers 129/2006 and 130/2006 of the Government of Mozambique

5.3.4.3 Public Participation Program

The Consultant shall provide information to all concerned and affected parties on the project, for consulting with the parties on a regular basis throughout the period of preparation of the EIR and site-specific studies. It give an opportunity for public review and comments on the draft EIR, and for preparing a report for submittal to the environmental regulatory authority, that summarizes all comments.

5.3.4.4 Resettlement scoping

Some or all of the project components may involve either physical or economic resettlement. During the feasibility stage the extent of resettlement will be scoped out and means of minimizing or avoiding resettlement will be explored. The resettlement scoping will be carried out in Phase 1 A and will be part of the Resettlement Framework (RF) that the Consultant shall development during Phase 1 B including chapters that will be used in the Resettlement Action Plan (RAP). Resettlement scoping and the RF shall comply with Involuntary Resettlement of GoM and the World Bank guidelines.

Project components or activities that give rise to resettlement need to be identified along with their zone of impact. Design alternatives need to be discussed with the engineering team to consider how to avoid or minimize resettlement, especially relocation. Where resettlement is still necessary, scoping of land ownership and use need to be carried out. The number of people likely to be affected needs to be estimated using an house counting and other sources for instance, desktop review of studies, aerial photos, and where appropriate, consultation with local leaders.

5.3.4.5 Environmental and Social Impact Assessment Report

5.3.4.5.1 Draft Environmental and Social Impact Assessment Report (ESIAR)

During Phase 1 B the Consultant shall prepare a draft and final ESIAR for the project in accordance with applicable requirements of the GoM.

The Consultant shall submit a Portuguese and English version of both the draft and final ESIAR including annexes (also in both languages). The Consultant shall append to the ESIAR a general ESMP and site-specific ESMPs (as described below). The ESIAR should be structured by components of the project.

As a requirement, the Consultant shall:

1. Identify changes resulting project, both during and after construction of the project, including feasible alternatives under consideration that could affect the physical and natural environment within the area of influence for the two, and the socio-cultural, public health and safety conditions of its population.
2. Develop measures to be incorporated into final engineering design of each component of the project that will prevent or mitigate as much as possible any adverse effects during construction and/or operation on vegetation and fauna, hydro-geomorphological processes, surface water quality, river flow, fisheries and aquatic ecology and communities. This should arise out of detailed iterative design of the scheme carried out by the environmentalist, social scientist and engineer working closely together at the earliest stages following a joint and thorough site investigation.
3. Identify possible changes in the use patterns of natural resources (soil, water, etc.) and in the patterns of human settlement, in particular relocation of residents and farms, because of implementation of the project within the areas of influence. Particular attention will be given to changes and inappropriate land usage, water and air contamination, public health

and hygiene and/or to possible risks imposed on fragile ecosystems, including wetlands, stream and spring habitats, within or outside protected areas. Potential impacts to known or potential sites of historical, archaeological, or cultural significance should be included.

4. Formulate recommendations to prevent, mitigate or correct such effects and to establish a system for monitoring and controlling the free access or/and indiscriminate use of the natural resources that should be protected, for those elements of each component of the project where adverse negative environmental or social effects occur

5.3.5 Planning of the Project

The Consultant shall collect relevant data relating to the water supply sector, from existing reports, studies and other documents, including on-going activities of other Governmental and non-governmental agencies, and the private sector to provide an information base for undertaking the feasibility study and to determine, in consultation with FIPAG and relevant GoM entities, the requirements for additional field data collection and investigations.

5.3.5.1 Evaluation of Existing Works

In each of the two cities, the Consultant shall determine the capacity, performance, reliability and condition of all the main elements of the existing water supply system to accommodate new bulk of water from upcoming project.

The Consultant shall determine the need for refurbishment or replacement of existing works, and the need for new works to eliminate any bottlenecks or increase capacity, meet water quality standards, increase the reliability of the system and improve operational efficiency.

5.3.5.2 Water Resources Investigations and water treatment study

The consultant is required to assess the quality of Zambeze River water for the proposed Water Treatment Plant Component.

The Consultant should obtain from, DNGRH and other GoM entities relevant data and information about Zambeze River, including past reports and hydrological data. Past reports are to be critically reviewed.

To assess the potential for Zambeze River the Consultant shall undertake the following work:

- Collect details of river flow for sufficient period to assess the reliability of the source.
- Assess the likely safe yield (reliable output) of Zambeze River during dry season. The assessment of yield should take account of the environmental, social, and economic impact of proposed abstractions.
- Identify and visit potential intake site to confirm its suitability as locations for river intake. Identify factors that may affect development at site, including potential upstream and downstream impacts, and describe potential risks associated with the proposed intake.
- Obtain existing river gauging, climate and rainfall station data relevant to the potential intake site. The Consultant should critically examine these data to determine quality and reliability. As needed, the Consultant should visit existing gauging stations sites used to the record the data obtained for the analysis in order to make a judgment on the reliability of the data. If possible, the Consultant should take spot measurements of flows at proposed location of Intake in the dry season.
- In the case where a potential site lacks accurate data or records, the Consultant should estimate the reliable yield of the source by correlation with the nearest suitable gauged catchment based on catchment areas and rainfall. The Consultant shall advise on an appropriate return period

for assessment of the minimum flow in the river for the purposes of determining its suitability as a source for a water supply at location of Intake.

- Asses the quality of the water from potential intake site and describe the nature of treatment that would be required to bring the water up to GoM potable water standards. The Consultant should obtain water samples and submit them for testing at a reliable and qualified laboratory for the normal parameters for a potable water supply. The analyses should cover the normal range of parameters for a potable water supply, including temperature, turbidity, pH, EC, TDS, calcium, magnesium, sodium, carbonate/ bicarbonate, chloride, sulphate, nitrate, nitrite, ammonia, fluoride, arsenic, iron and manganese. Measurements shall be made on site for parameters that are likely to change with time (temperature, pH, iron). Should also the analyses of any toxic substances likely to be present from activities upstream of potential intake site.
- The results of all tests shall be included in the final Feasibility Report.

5.3.5.3 Planning Criteria and other Relevant Planning Data

In the Phase 1 A report, the Consultant shall present planning criteria to be used for the proposed works, including:

- Population projections for each city, by year, from now until the year 2040;
- Planning issues arising out of public consultations and and Water assessment;
- Specific consumption for households with different service types (house connections, yard taps and standpipes);
- Factors for assessing peak day and peak hourly flow requirements;
- The basis of assessment of non-household demand;
- Treated water quality standards;
- Appropriate materials and design standards for the construction of intake, water treatment plant and transmission mains;

In general, the planning criteria should follow those developed by FIPAG and other regulatory documents. Nevertheless, where necessary adjustments can to be made to suit the local conditions.

5.3.5.4 Transmission mains

The Consultant should determine an optimum alternative for development of water transmission mains from water treatment Plant to the existing water supply systems.

The Consultant shall examine the distribution systems, identify the best point of connection to existing water supply schemes taking into account the maximum and minimum residual pressures at key points and assess losses from the system.

5.3.6 Financial Analyses and Socio-Economic Studies

Project implementation costs shall be estimated based on a careful and well-informed combination of local and foreign costs consistent with international best practices and procurement data, obtained from similar works elsewhere in the region. The costs shall duly separate foreign and local cost components and allow for both physical and price contingencies.

5.3.6.1 O&M Costs

Operation and maintenance costs should be evaluated for each alternative option, based on the estimated personnel and management requirements, labour and material, maintenance and repair costs, transport, energy, chemicals, and other operating costs.

5.3.6.2 Financial Analysis

The Consultant shall collect available financial data in order to determine the financial viability of the technically acceptable options. In particular, the study should access the costs and the benefits accruing over time under each recommended option and perform discounted cash-flow analysis to determine the NPV, the FIRR, EIRR Average Incremental Cost or Marginal Operating Costs. Financial and economic considerations based on the above-mentioned criteria and on sensitivity, analyses and worst-case scenarios will be utilized in the study to draw the conclusions and recommendations for the proposed alternative of the project, *inter alia*:

- The average incremental costs throughout the life-cycle of the project;
- The NPV of project costs; and
- The financial rate of return.

5.3.6.3 Comparison of Alternatives

Alternative option shall be assessed based on:

- Technical merit;
- The net present value, FIRR, EIRR of their capital and operating costs;
- Environmental, social, and resettlement impacts;
- Local availability of resources for construction and operation of the scheme;
- Ease of long-term maintenance;
- Ease of implementation; and,
- Risks

Environmental and social impacts and risks shall be quantified and included in the calculation of the net present value of the costs

5.3.7 *Implementation Plan*

The short-listing of alternatives and comparison to select the best to implement will have been done while looking at all improvements, to the year 2040. The implementation planning documents will incorporate environmental and social aspects, including monitoring and resettlement planning and implementation. Additionally, Environmental and Social Management Plans and Resettlement Plans shall be prepared.

5.3.8 *Outline Designs*

Once identified the best alternative to be implemented, the Consultant shall prepare a set of outline designs for works. Designs shall be presented in a form that will allow the detailed designs to proceed with limited review or revision. The specific requirements for these outline designs are described below.

The outline designs for the project shall include:

- The location of intake, including its layout and the size.
- Raw water pumping stations and capacity in terms of number of pumps, output and operating head;
- Water treatment plant location and outline layout plan, showing the size of the main treatment process units;
- Treated water pumping stations, location and capacity in terms of number of pumps, output and operating head;
- Routes, lengths and diameters of transmission mains;
- A description of ancillary facilities and equipment to be provided; and,

- Power requirements for the Intake, Water Treatment Plant, pumping stations and standby generation.

5.3.9 *Cost Estimates*

Based on the outline designs, the Consultant shall prepare cost estimates for the project. These estimates shall be accurate to within +/- 15 percent.

6 SCOPE PHASE 2 ACTIVITIES

6.1 Detailed Design

6.1.1 *General*

The following describes the outputs expected from the consultant in order to come to construction of intake on Zambeze River, Water Treatment Plant and Transmission pipeline connecting to existing water supply schemes in Tete and Moatize cities, in Tete Province. The detailed technical designs and tender documents shall be prepared in sufficient detail to works. These will include:

- Engineer's confidential estimate of cost of works to completion, with a separate estimate of the cost of supervision.
- Topographical surveys for installation sites and routes of pipelines. Surveying of the cities areas by hand-held global positioning system (GPS) on a world geographic reference system to locate boundaries, physical data such as roads, streams and lakes. The GPS horizontal accuracy must be equal or better than 4m.
- Geotechnical surveys of sites for structural designs;
- Hydraulic computation of the systems operating under design conditions as well as other critical conditions, leading to the computation of a hydraulic grade line under each of these conditions.
- Detailed sizing of works and selection of components of works leading to dimensioning of Intake, water Treatment Plant, transmission pipelines;
- Detailed location of connecting point between transmissions pipelines and existing water supply schemes of Tete and Moatize cities.
- Structural designs of buildings, thrust blocks and valve chambers, giving the required strength of masonry, concrete, timber works, reinforced concrete and other building materials, bar bending schedules and bar placing drawings;
- Construction drawings;
- Quantity take-offs and preparation of bills of quantities, and/or schedules of materials as appropriate for the nature of work or the intended mode of procurement;

The results of the design shall be presented in the form of a Design Report and supporting technical information for preparation of Tender Documents. The Design Report shall cover an overview of criteria used in the design, the result of various analyses and its conclusion, a presentation of the detailed project, its costs, and input requirements. The cost estimate shall show the base costs and allow for escalation of prices. It shall be complete in itself and show the cost of works and the cost of supervision.

The supporting technical information for preparation of tender documents shall include the following: a summary description of the project works, Technical Specifications, Bills of

Quantities, Contract Drawings and Plans. The Drawings shall be to scales, as appropriate for the intended purposes, but shall generally confirm to the following requirements: location plans 1:20:000 to 1:10:000, Intake, Water and transmission main 1:100 to 1:50 and buildings and chambers at 1:10. The Consultants discretion will be required within these limits.

6.1.2 Environmental and Social Management Plan (ESMP)

The detailed design shall take full account of the possible negative environmental and social impact during implementation, and during operation of the project. The cost of the project shall include modification in design and additional components aimed at mitigating these effects. The project components shall include a management and monitoring program clearly identifying actions to be undertaken. The implementation planning documents shall incorporate environmental and social aspects, including monitoring and resettlement planning and implementation. The Consultant shall prepare an Environmental and Social Management Plan (ESMP) to avoid, reduce or compensate for significant adverse impacts or enhance positive impacts; this ESMP will address issues applicable to all sites and will provide information for typical kinds of mitigative measures that are normally needed for construction and operations. The Consultant shall also prepare a site-specific EMP for each component of the project. The ESMP will specify for each mitigative measure timing, cost, locations, and institution responsible as elaborated below. The ESMPs shall be appended to the EIR. The ESMP shall include:

- a) A description and estimated costs of the specific mitigation actions;
- b) A risk and emergency control plan, a maintenance action plan, and an environmental education program.
- c) Development of a Monitoring and Evaluation Plan to be followed during the construction and operational phases of the project.

The deliverable is a complete draft of the EIR in Portuguese and English that is appropriate for submission to environmental authorities and as compliance with Decree Number 45/2004, General Directive Numbers 129/2006 and 130/2006 of the Government of Mozambique (GoM).

6.1.3 Resettlement Framework

Based on the findings of the resettlement scoping activities carried out in Phase 1 A, the Consultant shall develop a RF that includes the following information: (a) a brief description of the project and components for which land acquisition and resettlement are required; b) principles and objectives governing resettlement preparation and implementation; (c) a description of the process for preparing and approving resettlement plans; (d) estimated population displacement and likely categories of displaced people; (e) eligibility criteria for defining various categories of displaced persons; (f) methods of valuing affected assets; (g) a description of the implementation process, linking resettlement implementation to civil works; (i) a description of grievance redress mechanisms; j) a description of socio-economic, cultural and historical elements related to land use in the affected area.

6.1.4 Evaluation and Recommendations

The study shall confirm that the project represents the most appropriate way of meeting the Client objectives from the technical, financial, socio-economic and environmental point of view based on the criteria agreed with the FIPAG.

Summarize the principal technical considerations that have shaped the design of the project and confirm that the project is the least-cost option, with optimal configuration of components and that it can be implemented with means readily available.

6.1.5 Risk and Uncertainties

Identify any other factors beyond the control of project management that could have an impact on the success of the project at implementation and during operation. Estimate the probability of occurrence and consequence of hazards or peril and recommend appropriate mitigating action. Carry out a sensitivity analysis of the parameters computed under the feasibility study.

7 COMBINED COMPOSITION OF THE CONSULTANCY TEAM, QUALIFICATIONS AND LEVEL OF EFFORT

The Consultant shall be a reputable Civil Engineering Consultancy firm with at least 15 years' experience in urban water engineering, including 7 years' experience in the design and supervision of construction of Intake, Water Treatment Plant and Transmission mains for urban water supply systems. The Consultant should be fully conversant with World Bank procurement documents, FIDIC Conditions of Contract and construction of projects in developing countries.

The Consultant shall propose appropriate full time and part-time staff and time inputs for the assignment but it is anticipated that the following key personnel will be required as well as draughtsman and technicians. The professional inputs required for the assignment, to be completed within a period of 15 months, is estimated at 50 person months, excluding support staff. The minimum requirements for key staff are as detailed below:

1. Project Manager
2. Water Resources specialist
3. Water Supply Engineer(s)
4. Water Treatment Engineer:
5. Mapping Specialist and Surveyor
6. Environmentalist Specialist
7. Social Specialist; and
8. Socio-economic and financial specialists
9. Resettlement Specialist(s).

The profiles and duties/responsibilities of the key staff, each of whom must be fluent in written and spoken English, are as indicated below. Portuguese language skills are desirable and even required for some positions, also as indicated below. The Consultant shall provide adequate staff with appropriate qualification and experience to undertake the works described herein. Key personnel shall have at least five years experience on similar projects in developing countries and experience in Africa, especially southern and eastern Africa, is highly desirable.

Position	Responsibility and Qualification	Efoort Level (person-month)
Team Leader/Project Manager/Senior Engineer	The team leader shall be responsible for the proper conduct of the entire study and shall be the principal contact person between the Design team and FIPAG. The Team Leader shall be a Registered or Chartered Civil Engineer, preferably with relevant postgraduate training. He/she must have at least fifteen (15) years of cumulative experience related to water supply and water treatment studies and designs.	15

	The Team Leader must have had, in the last ten (10) years, specific experience in managing consultancy teams working on feasibility studies and detailed engineering design in at least two water and/or wastewater treatment projects of similar size and complexity. At least two (2) of these projects should have been in sub-Saharan Africa. Must be fluent in English; and the ability to speak Portuguese is highly desirable. The Team Leader will be full time for the duration of the project, except for normal annual leave.	
Water Resources Specialist	The Water Resources Specialist shall be responsible for leading water resources investigations and producing an assessment of the yield and quality of Zambeze River for the Tete and Moatize. He/She shall guide the work of the Hydrologist in the collection and analysis of necessary information to produce the assessment. The Water Resources Specialist shall hold a degree in Water Resources, Civil Engineering, or Hydrology with not less than fifteen (10) years work experience in water resources planning, including basin-wide resource assessments and development planning, and water quality analysis and assessment. He/She shall have served as a Water Resources or Water Quality Specialist on at least Five (3) water supply projects of similar magnitude and complexity within the last eight (8) years. It is preferable that at least one of these projects have been in Sub-Saharan Africa. Postgraduate qualifications in a relevant field such as Hydrology are desirable. Must be fluent in English; and Portuguese would be an advantage.	6
Water Supply Engineer	The Water Supply Engineers shall be responsible for assessing the feasibility of engineering options, developing the optimum schemes, establishing the technical feasibility of proposed components, identifying appropriate improvements and extensions to the water supply system. They shall be a Registered or Chartered Civil Engineers, and shall have not less than fifteen (7) years of relevant experience in the planning and design of water supply systems. He/She must have specific experience working as a water supply engineer on at least two (2) projects of similar nature and complexity of which at least one should be from sub-Saharan Africa. Postgraduate qualifications in Civil Engineering are desirable. Must be fluent in English; and Portuguese would be an advantage.	6
Water Treatment Engineer	The Water Treatment Engineer shall be responsible for assessing the feasibility of engineering options of the project's water treatment system. He/She shall be a Registered or Chartered Civil Engineer, and shall have not less than ten (10) years of cumulative experience in the planning and design of water supply and treatment systems. He/She must have specific experience working as a water treatment engineer on at least two (2) projects of similar nature and complexity of which at least one must be from sub-Saharan Africa. Postgraduate	5

	qualifications in Civil Engineering is desirable. Must be fluent in English; and Portuguese would be an advantage.	
Mapping Specialist and Surveyor	The Mapping Specialist and Surveyor shall be responsible for topographic surveys, mapping of the service areas and pipeline alignments, adequate for the depiction of the existing systems and the location of alternative schemes. He/She shall hold a Degree or Advanced Diploma in Land Surveying and have not less than eight (8) years of cumulative experience related to Land Surveying activities. He/She must have specific experience working as a topographical surveyor on at least two (2) projects within the eight (8) years involving feasibility study and detailed engineering design. Working knowledge of GIS is required, and relevant experience working in tropical developing countries is desirable. Must be fluent in English; and Portuguese would be an advantage.	5
Environmental Specialist	The Environmental Scientist shall be responsible for carrying out the environmental and social impact assessment. He/she shall be a qualified professional with 10 years experience in environmental impact assessment and development of mitigation measures associated with water supply and sanitation projects, including work on at least two (2) water supply and sanitation projects of similar magnitude and complexity, and experience in Sub-Saharan Africa. He/she must also have work experience in Africa and be fully cognizant of the Mozambican Environmental regulation to ESA and gender-related issues. Experience in health impact assessment would be an advantage. Must be fluent in Portuguese and English.	5
Social and Resettlement Specialist	The Social and Resettlement Specialist shall be responsible for carrying out the gender-based Water and Sanitation assessment and the social impact assessment (SIA), and ensuring that the engineering and environmental teams work together to minimize resettlement and other social impacts during the design. Shall be also responsible for all resettlement issues and plans and ensuring that the social specialist, engineering and environmental teams work together to minimize resettlement and other social impacts during the design. He/She will also be responsible for ensuring that community, and particularly women's needs and demands, are investigated and brought to bear on the design of the project, at all stages as outlined on the this assignment. He/she shall be a qualified professional with 10 years' experience in gender-based community development in Africa, working on water and issues. He/She should have formal training in social research methods, with special skills in qualitative data collection and analysis and in community development and the preparation of resettlement action plans, and stakeholder consultation associated with new infrastructure projects. He/she must also have work experience on at least two (2) water supply and sanitation projects of similar magnitude and complexity. He/She must also be fully cognizant of the Mozambican regulations, and the on Involuntary Resettlement. Experience in	4

	health impact assessment would be an advantage. Must be fluent in Portuguese and English.	
Socio-economic and financial specialist	The socio-economic and financial specialist will be responsible for collection, planning, supervising and analysing of socio-economic and financial data. He/She should have formal training in socio-economic research methods and computing NPV, IRR, Incremental Cost or Marginal Operating Costs applied to water and sanitation projects. He/She must also have work experience on at least two (2) water supply and sanitation projects of similar magnitude and complexity. Must be fluent in Portuguese and English.	4
Total		50

7.1 Support Staff and Other Experts

The consultant can provide support staff to assist in the above key experts in their activities. The costs of support staff must be included in the fee rates of the experts.

For the purposes of this contract, international experts are those whose permanent residence is outside the beneficiary country while local experts are those whose permanent residence is in the beneficiary country.

The Consultant shall pay attention to the need to ensure the active participation of local professional skills where available. All experts must be independent and free from conflicts of interest in the responsibilities accorded to them.

The selection procedures used by the Consultant to select these other experts shall be transparent, and shall be based on pre-defined criteria, including professional qualifications, language skills and work experience. The findings of the selection panel shall be recorded. The selection of experts shall be subject to approval by FIPAG.

8 ASSIGNMENT SCHEDULE, REPORTING REQUIREMENTS, DELIVERABLES AND PAYMENT

8.1 Activities Schedule

Phase 1 A of the study is to be completed within twelve (8) months of the order to commence, and phase 2 shall be completed within eighteen (7) months after its commencing.

Approximately three weeks before the end of Phase 1, the Consultant shall organise two workshops one in Tete another in Maputo to discuss his proposals as outlined above. Any comments shall be recorded and taken into consideration before issuing the Phase 1 report.

The Draft Feasibility report should be issued to FIPAG as two A4 size volumes (executive summary and main report) accompanied by separate volumes of Appendices together with a set of A2 size drawings. The Consultant shall submit 5 paper copies of the draft Report plus 2 copies on CDs in English. The executive summary shall be in Portuguese and in English,. FIPAG will

have two weeks to review the document. The Consultant shall then revise the report and, in particular, the planned work for Phase 2 in the light of discussions with the principal interested parties.

The Final Feasibility report should be presented as two A4 size volumes (executive summary and main report) accompanied by separate volumes of Appendices together with a set of A2 size drawings. The Consultant shall submit 10 paper copies of the draft Report plus 2 copies on CDs in English. The executive summary shall be in Portuguese and in English.

The Final Detailed Design shall be submitted A4 size volumes (executive summary and main report) accompanied by separate volumes of Appendices together with a set of A2 size drawings. The Consultant shall submit 10 paper copies 2 copies on CDs in English. The executive summary shall be in Portuguese and in English.. Reports, analyses, calculations and other similar documents shall be submitted in MS Office format (MS Windows), and as collated documents in .PDF file format. All sketches shall be submitted in .PDF file format. All drawings shall be submitted in .DWG file format.

8.2 Reporting Requirements

8.2.1 Planned Deliverables

The consultant is required to produce the following reports:

- Inception Report
- Data and design criteria report
- Draft Final Feasibility Study
- Environmental Pre-feasibility Report and Scoping Study (EPDA) Report
- Draft Environmental and Social Impact Assessment and Resettlement Action Plan Report
- Final Environmental and Social Impact Assessment and Resettlement Action Plan Report
- Final Feasibility Report
- Progress Reports
- Draft Final Design Report
- Tender documents
- Final Design Report
- Implementation Report

8.2.2 Inception Report

This will present initial findings regarding data availability and develop the Consultant's methodology and schedule of work in more detail in the light of his initial findings. The Inception Report shall contain:

- The availability of data and the outcomes of analysis of that data;
- Preliminary assessment of environment and social issues, a preliminary resettlement scoping
- The Demand Forecast, with details of the analysis included as an appendix;
- Details of the water resources investigations.
- A description of the existing water facilities, including assessments of condition and performance.

- Listing of alternative schemes to meet the demands to 2050 (long list) and filtering process to develop a short-list of viable alternatives; and
- A short list of feasible alternative schemes that merit more detailed assessment and
- proposals for work in Phase 2

8.2.3 *Data and design criteria report*

The consultant shall, within two (2) months of commencement of this phase 2, present in a report form, his findings following the desk review of available information and field investigations, a summary of the design approaches to be followed, the design criteria, a detailed program and details of any other topic that is relevant to the design phase. The report shall indicate areas of information deficiency and outline the necessary supplementary fieldwork to collect the same. It shall in addition seek clearance of the various parameters and criteria to be used in final designs.

8.2.4 *Draft Final Feasibility Study*

At the end of 10 months, the Consultant shall prepare the draft Final Feasibility Report. This report should be a comprehensive stand alone of the study. The Draft Final Feasibility Study report shall contain:

- Descriptions of the existing water facilities, and any ongoing works.
- The forecast of demand for water services in the two cities;
- A detailed assessment of the water resources available to meet these demands;
- Results of the environmental and social analyses
- The initial review of alternative schemes and the formulation of a short list of potentially feasible options;
- Comparison of the short-listed alternatives using multiple criteria analysis, including financial, environmental and social costs and benefits, and clear reasoning for selection of the preferred option;
- Implementation plan that focus on actions, which shall contain the following:
 - Definition of the components of the project;
 - Outline designs of the project components;
 - Estimates of the CAPEX and OPEX of each of the components of the project;
 - Environmental management plans for the components to be implemented, including resettlements plans;

The Feasibility Report shall incorporate details of the following, in appendices:

- The Environmental Impact Report, EMPs, Public Consultation Report and Resettlement Policy Framework
- Water demand forecasts;
- Necessary data collection to perform financial analyses;

The Draft Final Feasibility Report shall include an executive summary outlining the demand for water supply services, recommended developments to 2040, and the reasons for selection of the proposed plan and the works to be implemented.

8.2.5 *Final Feasibility Report*

The Final Feasibility report should be presented as two A4 size volume (executive summary and main report) accompanied by separate volumes of Appendices together with a set of A2 size drawings.

The Consultant shall submit 15 paper copies of the draft Report plus 3 copies on CDs in English. The executive summary shall be in Portuguese and in English. The output of the consultancy should be also presented in a consultative meeting.

The Final Feasibility Report shall be prepared after receipt of comments from FIPAG on the Draft Final Feasibility Report, which shall be amended in accordance with these comments and any subsequent discussions and agreement on the issues raised.

8.2.6 *Progress Reports*

The Consultant shall produce concise monthly progress reports from the end of month 2 onwards. These reports will describe the work done in the previous month and outline forthcoming activities. Progress shall be recorded against the program presented in the Inception Report. The report shall clearly state how any delays in shall be made good.

8.2.7 *Draft Final Design Report*

The Draft Design Report s be presented towards the end of the study, approximately four (4) months from commencement of phase 2 study and shall comprise a summarized description of the proposed projects and detailed designs. Assumptions, design criteria, standards, and design calculations shall be clearly presented in annexes. Consultant's cost estimates broken down into the various components and expenditure schedules shall be produced. The Consultant shall submit 4 copies of draft design report, plus 2 copies on CD's for the final report. All reports shall be in Portuguese and English.

8.2.8 *Tender documents*

Within four (4) months of the start of phase 2 contract, the Consultant shall submit for review of FIPAG the Technical Information and Specifications, Bill of quantities, Cost estimation, Construction Drawings. Within 2 weeks after any required modifications or additions suggested by FIPAG the completed Final Technical Information and Specifications, Bill of quantities, Cost estimation, Construction Drawings shall be submitted to FIPAG for final approval.

8.2.9 *Final Design Report*

The report shall show the major results of the study and in particular the exercise entitled Evaluation and Recommendations. It shall be expected after five (6) months of the start of the study in this phase 2. The Consultant shall submit 10 copies of Final Design Reposrtt, plus 3 copies on CD's for the final report. All reports shall be in Portuguese and English.

8.2.10 *Implementation Report*

This report shall be presented at least two months before the completion of the study. It shall include the results of the Implementation study activities as outlined. The report shall present the different component of the project, the required organizational charts.

8.3 *Payment Schedule*

Payments for the services under the contract shall be made on the basis of agreed Lump Sums for each completed milestone of the assignment. The relative milestone payments is a proportion to the total sum for the assignment.

8.4 Form of Contracts for Consultancy Services

The contract related to Detailed Design Phase will be awarded on the discretion of FIPAG, based on the good performance of the Consultant in phase 1.

Two Consultancy Contracts will be awarded which cover the scope services described above, as follows:

Ref	Consultancy Contract Nr	Description	Form of Contract
1	FIPAG/WASIS II/ CON- 67/22	Feasibility Study and Detail Design	Lump Sum

The Consultant will be selected in accordance with the procedures set out in the World Bank's Procurement Regulations for IPF Borrowers - Procurement in Investment Projects Financing of July 2016, revised November 2017 and August 2018.

8.5 Schedule of Deliverables and Payment

The timing of key reports, starting from the date of commencement of work, is given below.

It is anticipated that the Contracts for Feasibility Study and Detailed Design, started and completed as per the dates set out in the table below.

Output (approved versions)	Percentage of Lump Sum	Duration (months)
Phase 1: Feasibility Study	55%	SD + 8 months
Inception report	5.0%	SD+1 months
Draft Final of Feasibility Study Report	8.0%	SD+4 months
Environmental Pre-feasibility Report and Scoping Study (EPDA)	7.0%	SD+5 months
Draft Environmental and Social Impact Assessment and Resettlement Action Plan Report	5.0%	SD+6 months
Final Environmental and Social Impact Assessment and Resettlement Action Plan Report	10%	SD+7 months
Final Feasibility Study Report	20%	SD+8 months
Phase 2: Detailed Design	45%	SD +7 months
Data and design criteria report	5.0%	SD+10 months
Draft Detailed Design Report	10.0%	SD+12 months
Detailed Final Design Report, & drawings	20.0%	SD+15 months
Tender documents	5.0%	SD+15 months
Implementation Report	5.0%	SD+15 months
TOTAL	100.0%	

The duration presented above for the design includes the comments and approvals by FIPAG, estimated to take 15 calendar days from the submission date.

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