

**DEMOCRATIC REPUBLIC OF TIMOR-LESTE
MINISTRY OF PUBLIC WORKS**

**CONSULTING SERVICES FOR DETAILED ENGINEERING
DESIGN OF TIMOR-LESTE FOUR MUNICIPAL CAPITALS
WATER SUPPLY & SANITATION PROJECT**

Contract
RFP/039/MOP-2019

**PROJECT DOCUMENT FOR ENVIRONMENTAL LICENSING
SAME CITY**

Rev.0 – Draft for Client Review

SEPTEMBER 2020

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ACRONYMS AND ABBREVIATIONS

2DCWSP	- Second Districts Capital Water and Sanitation Project
4MCWSSP	- 4 Municipal Cities Water Supply & Sanitation Project
ADB	- Asian Development Bank ^{[1][2]} _(SEP)
FSTP	- Faecal Sludge Treatment Plant
PDC	- Project Design Consultant
DED	- Detailed Engineering Design
DGAS	- General Directorate for Water and Sanitation
SMASA	- Municipal Service for Water, Sanitation, and Environment
SMASA-National	- National office for SMASA
SMASA-Same	- Same Regional Office for SMASA
EARF	- Environmental Assessment and Review Framework
EHS	- Environment, Health and Safety
EIA	- Environmental Impact Assessment
EIS	- Environmental Impact Statement
EMP	- Environmental Management Plan ^{[1][2]} _(SEP)
EMR	- Environmental Monitoring Report ^{[1][2]} _(SEP)
ESS	- Environmental Safeguard Specialist ^{[1][2]} _(SEP)
ESA	- Environmental Safeguard Assistant ^{[1][2]} _(SEP)
FSTP	- Faecal Sludge Treatment Plant
GRM	- Grievance Redress Mechanism
IEE	- ^{[1][2]} _(SEP) Initial Environmental Examination ^{[1][2]} _(SEP)
IFC	- International Finance Corporation
Masl	- meters above sea level
MPW	- Ministry of Public Works
PA	- Protected Area
PD	- Project Document
PMU	- Project Management Unit
SEA	- Superior Environmental Authority
SEIS	- Simplified Environmental Impact Statement
SEMP	- Site-specific EMP
SPS	- Safeguard Policy Statement ^{[1][2]} _(SEP)
TOR	- Terms of Reference
WDZ	- Water Distribution Zone
WTP	- Water Treatment Plant ^{[1][2]} _(SEP)
WHO	- World Health Organization
^{[1][2]} _(SEP) WSS	- Water Supply And Sanitation ^{[1][2]} _(SEP)

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INTRODUCTION

The significant growing number of the population in all Municipalities is resulting in the increase of water demand and wastewater production in the private and domestic sectors. Issues such as continuous water scarcity, poor infrastructures, inadequate water and wastewater quality has led the Government of Timor-Leste to focus on the water and sanitation improvement, particularly in the district areas.

The Four Municipal Capitals Water Supply & Sanitation Project (4MWSSP) will support the Government of Timor-Leste in providing access to improved water supply and sanitation (WSS) in 4 municipalities (Baucau, Los Palos, Viqueque and Same) by drawing on experiences and lessons learned from the ADB Second District Capitals Water Supply Project [2DCWSP] (46160-001) ADB TA-8064 TIM. ^[1]_{SEP}

The project will build upon the current Government efforts in providing water supply and sanitation (WSS) services in Timor-Leste's urban areas, working towards the achievement of Sustainable Development Goal (SDG)-6 to ensure availability and sustainable management of water and sanitation for all by 2030, in line with the country's Strategic Development Plan 2011 – 2030 (G-RDTL, 2011), specifically the water sanitation strategy of "...providing a safe piped 24-hour water supply to households in 12 District [now "municipality"] centres..., by 2030,..." across Timor-Leste. It will also finance climate-resilient and inclusive WSS infrastructure in project municipalities and strengthen institutional and community capacity, sustainable service delivery, and project development.

The 4MWSS Project intends to produce the following outputs:

- 1) Propose the rehabilitation and expansion of the urban water supply system for Baucau, Los Palos, Same and Viqueque municipal capitals.
- 2) Establish fully functioning water supply and sanitation infrastructure in pilot schools and public areas i.e. markets that is effectively operated, maintained, and managed to provide a minimum level of service for water supply and sanitation to all citizens.
- 3) Facilitate new or improved household sanitation in all households in the Municipal capitals of Baucau, Los Palos, Same and Viqueque.
- 4) Establishing septic tank sludge treatment and disposal facilities and associated sludge transport system in the municipal capitals.

The Ministry of Public Works (MPW) is responsible for planning, implementation, regulation, and monitoring of WSS, specifically the General Directorate for Water and Sanitation (DGAS), which, under the MPW, supports the Water and Sanitation facilities in the municipalities, these operated locally by the SMASA regional office.

The MPW recognized its regulatory duty, as project proponent, as mandated in Decree Law No. 5/2011 - Environmental Licensing, to file a Project Document to the National Authority for Environmental Licensing (ANLA), as the start-up document for project screening and categorization under the environmental licensing process.

This Project Document's objective is to provide clear and relevant information on the proposed Water and Sanitation System Improvement Project for **Same City only** (hereinafter called "Same WATSAN Project"), identified, located and described in Chapter 4.1, taking into account that its rehabilitation will be carried out under a future ADB loan to the Government of Timor-Leste.

One of the Project Document's primary source of information is a previous study carried out in 2015, by the consultancy firm Aurecon (ADB, 2016), commissioned by the ADB (Asian Development Bank) to carry out the Technical Assistance (TA-8064) for the Second (2nd) District Capitals Water Supply Project (46160-001) and produce a demand responsive investment Master plan to meet the water supply and sanitation needs of Timor-Leste's urban populations in Baucau, Lospalos, Viqueque and for Same, for the period to 2030, in line with national development plans and targets as outlined in the Timor-Leste Strategic Development Plan 2011 – 2030.

The ADB evaluated the environmental impact of the proposed rehabilitation through an Initial Environmental Examination (IEE) process under the ADB Safeguard Policy Statement (SPS) 2009 and concluded that the rehabilitation and management of the proposed Water and Sanitation components within the Same project area,

would improve significantly the life of the Same city dwellers, classifying the project as a Category B for environmental impact because the potential adverse environmental effects are site-specific, few (if any) were irreversible, and technical design and mitigation measures could be designed to address them.

Given the content of the information in the ADB commissioned IEE (ADB, 2015), this Project Document intends to propose a similar pathway and classification of the upcoming environmental study and provide updated information on the overall current legal and technical framework and secondary baseline data for the same components to, on the one hand, maintain the environmental thoroughness of the previous study and on the other hand verify if there is any change regarding the environmental impact conclusion and adapt and/or update the previous mitigation and management measures proposed to further improve the environmental sustainability of the future rehabilitated Water and Sanitation System in Same city.

I. PROPONENT DETAILS

The Ministry of Public Works (MPW) is responsible for planning and oversight of the Water and Sanitation Sector and is the Proponent for the Same WATSAN Project, supported by the General Directorate for Water and Sanitation (DGAS), responsible for the overall management, implementation and monitoring of the 4MWSSP project, while the SMASA Regional Office in Same will manage day-to-day Same WATSAN project implementation, construction and operation at the municipality level.

The project proponent and representative details/contacts for the Same WATSAN Project are the following:

Proponent

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The Ministry of Public Works (MPW), on behalf of the Government of the Democratic Republic of Timor-Leste, contracted the consortium Águas de Portugal Timor-Leste / Engidro to prepare the “Detailed Engineering Design of Timor-Leste Four Municipal Capitals Water Supply & Sanitation Project of Baucau, Manufahi, Lautem and Viqueque”, financed by the Infrastructure Fund of the Government of Democratic Republic of Timor-Leste. OASIS – Sustainable Projects is the Consultant subcontracted by ADP/Engidro for the environmental assessment and responsible in preparing this Project Document.

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2. PROJECT LOCATION AND SCALE

2.1 Geographical Location

The 4 MCWSS Same project is located in the urban area of Same city, Administrative Post of Same, Manufahi Municipality, with Turisca Administrative Post in the northern border, Faturberliu and Alas Administrative Posts in the eastern border, and bordering west with Ainaro Municipality (See Appendix 1). Geographic coordinates of the project site are in the SW latitude of 9° 4'1.07"S and longitude of 125°34'54.06"L and NE latitude of 8°55'50.35"S and longitude of 125°43'3.72"L.

2.2 Area Covered, Scale and Project Components

The Project scope includes all the areas that will be required to implement the Abstraction, Treatment and Distribution of Water for Human Consumption, as well as provide designs and solutions for Sanitation for Buildings, Schools and Housing within a diameter area of 15 Km around the city, as clarified by the client in April 2020, taking the Same Water Distribution Zones defined in the Second District Capitals Water Supply Project (ADB, 2016) as the guidelines for the project area and scope.

The 15 Km range area encompasses 7 sucos in total, namely Holarua, Letefoho, Babulu, Rotuto, Grotu, Daisua and Tutuluro for developing Water and Sanitation infrastructures. Moreover, half of the Kablaki Protected Area lies within the project area, which makes it different from other 2 municipality capitals of WATSAN project (Los Palos and Baucau Municipalities) (See). It is important to note that some sub project components i.e. Merbuti and Kotalala springs and water sub zone 6.3, which have been implemented since before the 2015 study, are located inside the periphery of Kablaki Protected Area.

During the Preliminary Design study, the team designated several location points and areas for the future pilot boreholes, the FSTP and the public toilets to be used for further investigation in the field. Regardless on compressing the coverage area, the existing water distribution system and future expansion on to new households in Same city are therefore decided to serve 3 Sucos, as follows:

- Suco Babulu: a small part of the Northern area of the Suco, as it lies almost totally within the 15 Km and includes a third of the proposed Water Supply Network, the existing Koloko Spring and 2 of the 3 proposed pilot wells testing sites, as well as 4 schools for the sanitation component;
- Suco Letefoho: the southern half of the suco lies within the 15 Km, where one third of the suco area is within the Mount Kablaki Protected Area, where the Kotalala and Merbuti Springs are located and includes a third of the water distribution network and the remaining proposed pilot well testing site, as well as 5 schools for the sanitation component;
- Suco Holarua: it lies totally within the 15 Km, where one quarter of the suco area is within the Mount Kablaki Protected Area, where the Erluli and Darelau Springs are located and includes the remaining third of the water distribution network, as well as 4 schools for the sanitation component;

!

Figure I - Project Location in Manufahi Municipality

The implementation of the project is associated according to the project cycle, which comprises of 4 phases, commencing from the design activity. The subsequent phases are the construction of the infrastructure, the operational and maintenance of the facilities, and the decommissioning. Taking into account that each component is considered in order to elaborate the environmental management plan comprehensively, the project components are all aggregated within the 15 km radius project scope as shown in Figure 3, to be rehabilitated and/or newly constructed as described below:

- a) Water Sources: mostly located in the upper ranges of the mountain system, which provides good quality water. Water origins are all from underground springs and are separated into two systems; North and South system These are composed of:
 - i) the Southern Supply System (Merbuti and Kotalala springs), mid-range of the Southern face of the Kablaki Mountain (adjacent to the inner border area of the Mount Kablaki Protected area);
 - ii) the Northern Supply System (Erluli and Darelau springs), mid-range of the Northern face of the Kablaki Mountain (adjacent to the outer border area of the Mount Kablaki Protected area);
 - iii) Cacaulara and Coloco springs, which are not a part of but are under consideration for the water distribution system, which lie in the mid area of the same upper plateau, in the middle of Same city and main distribution zones.
- b) Several new bore wells as additional sources to be included in the system and complement the existing springs. Prospection areas were studied and selected for bore testing.
- c) Water Distribution Zones: The two spring systems supply storage reservoirs and these subsequently supply 7 distribution zones throughout the higher plateaus of Suco Holarua, Letefoho and Babulu, through transmission and distribution alignments with gravitational system, including subzone 6.3 within the outer border of Protected Area.
- d) Sanitation sector: 4 public toilets pilot tests in located within the 15 km project area and a new Faecal Sludge Treatment Plant (FSTP) to be implemented in Akadiruhun, Suco Babulo, at the end of Zone 3, at a distance of 400m West from the nearest river and 300m from the river valley ravine. This proposed site is in an area with scattered tree species and invasive vegetation i.e. siam weed and has a large agricultural area 200m to the North.

Below are the selected images and remarks showing the pre-existing components to be rehabilitated and designated location to be newly constructed with project features.

Figure 2 - Selected images of Project Components



West view of northern System - Erluli Spring



West view of northern System - Darelau Spring



Northwest view of southern System - Merbuti Spring (Within PA)



Northeast view of southern System - Kotalala Spring (Within PA)



Cacaulara Spring



Coloco Spring



Southeast view of Erluli II (Potential origin)



East view of SMASA & JICA Distribution Network System - Kotalala spring



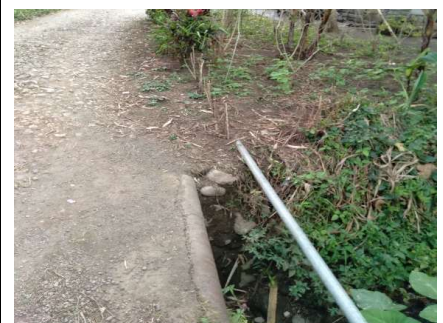
North view of transmission mains to be rehabilitated (Sub zone 3.4)



Southeast view of proposed prospection area in Aldeia Ailuli (Sub zone 7.2)



Subzone 6.3 (Southwest view)



Existing pipe in subzone 6.3 (west view)



Proposed FSTP, Akadiruhuhn Area, Suco Letefoho

2.3 Material Source and Project Cost

This project will need some raw materials for the implementation of construction activities such as sand, rocks and other necessary aggregated materials sourced from existing legitimate suppliers to be sourced nearby the project area. Before proceeding with the material sourcing, it is important to make sure that the activity is licensed. However, trenching will preferably chose to do backfilling with the excavated soil, in order to minimize mobilization and reduce excessive natural resource material use, while the cement is imported and the production of the concrete is done at project sites.

The preliminary cost of the 4MCWSSP for Manufahi Municipality is estimated around \$15,782,456 for proposed water supply and sanitation expenses, which is presented in the table below:

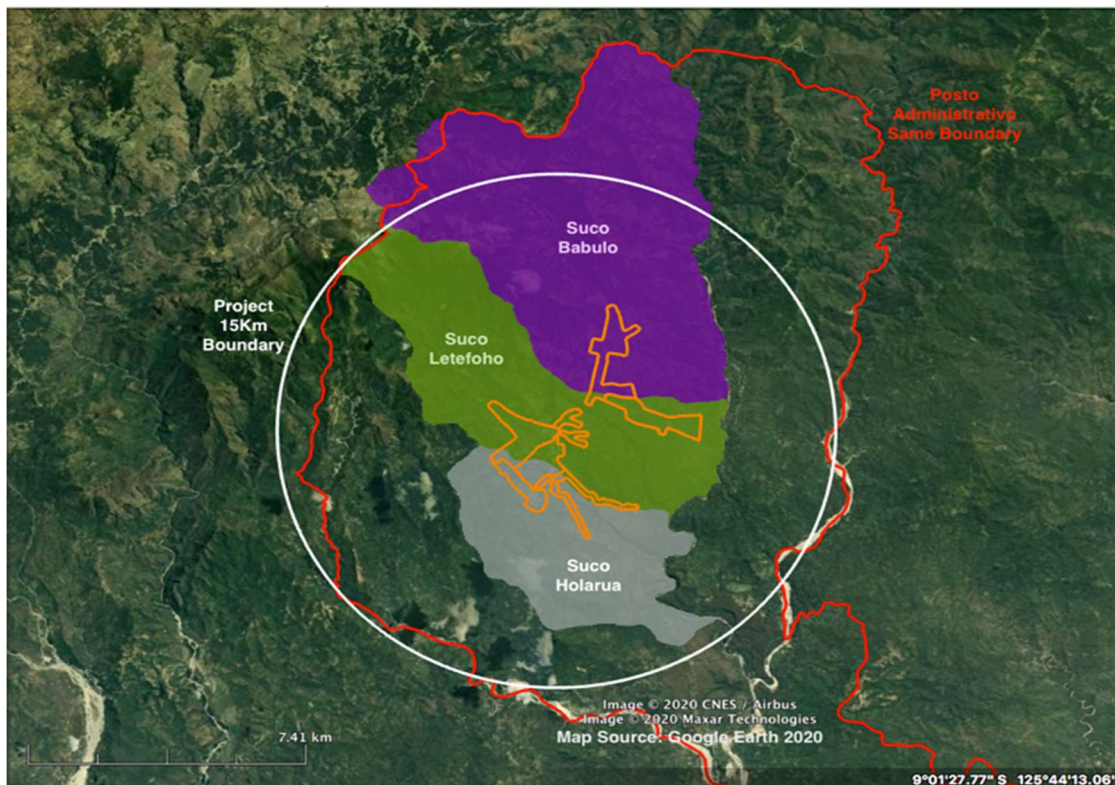
Table 1- Preliminary Cost Estimate for 4MCWSSP Manufahi Municipality

Water Supply System		USD (\$)
1.1.1.1.1.1	Water sources and raw transmission mains	2,586,876
1.1.1.1.1.2	Water treatment plant	-
1.1.1.1.1.3	Water tanks and pumping stations	4,543,193
1.1.1.1.1.4	Transmission mains	1,467,054
1.1.1.1.1.5	Distribution network	6,355,896
Sanitation		USD (\$)
1.1.1.1.1.6	Faecal Sludge Treatment Plant (FSTP)	624,000
1.1.1.1.1.7	Construction of 4 public toilets per City	205,440

3. DISTRICT AND VILLAGES

As previously mentioned, this project will cover 3 sucos, namely **Letefoho, Holarua and Babulu**. From a total of 28 Aldeias in these sucos, only 11 are going to be supplied by the system, namely Manico, Cotalala, Tomonamo, Ailuli, Ladique, Rialau, Urufu, Fatuco, Searema, Lapuro, and Raimerac.

Figure 3- Existing & Proposed Distribution System Overlaying 3 Coverage Sucos



4. PLANS AND TECHNICAL DESIGN OF THE PROJECT

4.1 Project Description

4.1.1 General Description

The aim of this project, in general, is to evaluate, assess and provide Detailed Engineering Designs (DED) for the following:

- 1) Rehabilitation of the Potable Water Distribution Network to consumers within the defined Water Zones;
- 2) Evaluate Existing and new sources for possible supply of the Water Distribution System;
- 3) Evaluate the condition and scale of the Sanitation situation in the Project Area and design wastewater treatment infrastructure for 4 Public toilets within the project's 15km diameter area;
- 4) Evaluate and Design a stand-alone Waste water Treatment Plant (WWTP) to receive the collection and treatment of septic tank sludge effluent from all households, buildings and schools within the 15 Km project range.

It is expected that by the end of the project, safe and reliable water supply will be provided to the municipal town (sucos and aldeias), and from now until the project horizon, all households will have improved hygienic toilets as well as toilets available in public places. The improved water supply and sanitation facilities in the pilot schools will provide children with safe and reliable water supply and toilets operated by competent operators in each pilot school, providing a template in other schools to improve water supply and toilets.

Finally, septic tank sludge will be safely transported and disposed of in purpose-built treatment facilities with the sludge transport and treatment facility operation contracted to a competent operator.

4.1.2 Water Supply System

A. Water Sources

Current Public water supply in Same depends on two independent systems, complemented by different sources and locations:

1. Southern system, with the Merbuti and Kotalala springs, located within the Protected area of Mount Kablaki;
2. Northern system, with the Erluli and Darelau springs

These spring sources are supplemented by adjacent mountain streams which provide good quality water, as per SMASA previous water quality testing results. However, both spring intakes tend to have high turbidity during wet season, where the overall springs overflow (and albeit the overflow is dry during dry season), indirectly contributes to agriculture activities e.g. animal husbandry and farming, during the wet season. In addition, there is also the issue of bacteriological contamination and threatened water quality, as they have no protection upstream, where numerous existing households lie, mostly with poor sanitation infrastructure i.e. pervious or no septic tanks.

Downstream to the Southern system range, there are two (2) other existing Spring Sources which are hydrogeologically associated with the main source from Merbuti and Kotalala springs.

Cacaulara spring corresponds to a groundwater source. The yield is unknown but the team confirmed that the remaining surface runoff from the water source in the field has a significant volume flow. Additionally, Coloco spring, located in the north east can also be considered as a potential source, given it has a constant flow of 5 lps used year-round by 20 neighbouring families in the adjacent community.

The Northern system consists of 2 existing springs namely Darelau and Erluli I with a total yield of 20 litres per second (lps) according to SMASA's estimation. The water from both sources are captured and transmitted directly to Holarua tank. Despite the abundance of water in the wet season, the flow in the dry season is practically non-existent in Darelau spring.

B. Distribution System

Same water distribution system is comprised of two main water sources (North and South) that supply dedicated reservoirs that store and subsequently supply all distribution zones through transmission and distribution alignments with gravitational system.

Two main reservoirs from Merbuti and Holarua tanks are comprised of an older Indonesian era reservoir and a newer JICA reservoir. Those mentioned storages are in good condition and considered effective.

Transmission mains in Same are a mix of old (mostly from Indonesian administration) and new pipelines from JICA's project which was completed in 2008. Additionally, a new transmission main for the river intake Merbuti was also built in 2012 by the DAA. Sections of the transmission mains are subject to very high static pressures because of the topography.

The distribution system includes old Portuguese pipes particularly in the older town area supplied by the Merbuti system, as well as significant lengths of mains from the period of the Indonesian administration, and some newer mains installed since the country's independence. In addition, the newer mains include substantial lengths of ductile iron and steel distribution mains in both the Darelau and Merbuti zones. According to SAS information, the existing connections are in a very poor state and without exception will have to be replaced.

In general, many of the older pipes, which were intended to be abandoned and replaced by the JICA system, remain functioning and consumer connections have not been transferred to the new distribution pipelines. This resulted in continued utilization of the older distribution pipelines, along with leaking/water loss conditions

Additionally, The JICA's project is also considered poorly integrated with the systems that were installed by the previous administration. It is said that many of the older pipes which were intended to be abandoned and replaced

by the JICA system remain functioning and consumer connections have not been transferred to the new distribution pipelines. This resulted in continuous utilization of the older distribution pipelines, along with leaking conditions.

Whilst the Same system is all gravity, the somewhat complex zoning with independent new and old systems, the deteriorating condition of the distribution system (including service connections) and illegal connection has resulted in a highly intermittent supply to many customers. The design of appropriate zoning to reduce static head to safe levels and minimise leakage will be one of the important aspects of this project.

C. Gaps in Water Supply

Water Balance: Demand vs supply.

Current water availability values are not sufficient for the present and future water demands, hence the DED Consultants have summarized an alternative solution with two different scenarios in terms of areas to be covered by the proposed system, namely:

- Scenario A: Master plan zones plus other areas in the boundaries that currently are being supplied by the existing systems;
- Scenario B: Areas considered in Scenario A plus other urban areas that currently are not covered by the existing system.

In Scenario A, the infrastructure design should consider the population growth for the next 10 years. While in Scenario B as the highest scenario, the infrastructure design is to allow future expansion by anticipating the amplifying investments in the next 20 years of estimated consumption.

The water demands were calculated considering the population growth rates defined in the D3 report and the distribution of demands along the proposed networks. Given the condition that the team has done some water resources investigations for bore wells but is still awaiting for the water debit study of the existing springs including the potential origins in Coloco and Cacaulara, which result in undetermined numbers of water deficits. Other optional way is rehabilitating the Merbuti and Darelau systems.

Table 2 - Water Demands & Deficits with Existing Sources

		1.1.1.1.1.8 Demands
1.1.1.1.1.9	2020 Scenario A ¹	43.2 L/s
1.1.1.1.1.10	2030 Scenario A ¹	57.8 L/s
1.1.1.1.1.11	2040 Scenario A ¹	77.3 L/s
		1.1.1.1.1.12 Existing sources²
Erluli		1.1.1.1.1.13 Large discrepancy between Master plan and SAS: 1.1.1.1.1.14 the master plan indicates a total value of 70 L/s (from all of the 4 springs), SAS technicians say that the springs almost dry in the dry season (photos prove it).
Darelau		
Kotalala		
Merbuti		

1.1.1.1.1.15 Deficit of water with current sources	
2020	?
2030	?
2040	?
Potential sources	
Borehole #1	1.1.1.1.1.16 7 L/s
Borehole #2	1.1.1.1.1.17 8-10 L/s
New springs ²	1.1.1.1.1.18 Coloco, Cacaulara and another spring near Erluli

- ¹- Master plan supply area
- ²- To be confirmed with hydrogeological study results

The deficit of water is still uncertain due to seasonal change, due to scarcity of water during dry season, although the master plan mentions a surplus of water supply.

New Sources. The team has identified a potential spring located 70 m from the Erluli spring, named Erluli II with a permanent flow. A cultural ceremony was conducted on the 15th October led by an accountable local traditional elder (lia naín) prior installing the v-notch equipment. According to local beliefs, this ceremony aims to anticipate social and cultural impact occurrences to the community and nature.

Figure 4 - Cultural Ceremony Preparation in Erluli II Spring



Boreholes for complementing other existing sources were tested in several prospection points and were completed within 2 months together with other city underground water investigations carried out from 27th July to 17th September 2020. 4 pilot wells were indicated and successfully performed in Aldeia Ailuli and Raiubu, although, only 2 bore wells are sufficient to meet the required yield, each with a total flow of 7 L/s and 10 L/s.

Figure 5 - Borewell testing at 2 sites of Aldeia Ailuli



4.1.3 Sanitation System

Based on the 2016 Master plan, the National 2030 target for household sanitation is 100% access to hygienic toilets and improved hygiene behaviour, consistent with the Government Resolution No. 8/2012 - Sanitation policy. However, major deficiencies of current toilets in Same are: open defecation practices; lack of cleanliness; insufficient water supply; poor construction standards and inadequate lighting. School Sanitation is also not “User friendly” (where none of the toilets cater for special infrastructural requirement of children, physically handicapped persons or menstruating girls), and there is inadequacy of funds for operation and maintenance.

In addition, according to the Master plan, only 27% households in Same practice open defecation and all the houses that do not practice open defecation are contributing with septage, either through their own toilets or shared toilets. These are presumed to have leaching pits functioning as septic tanks for all practical purposes. Hence all these sanitation facilities are producing digested sludge which needs to be removed once every two years.

4.2 Proposed Project Scenarios

4.2.1 Water Supply System

A. Water Sources

As previously mentioned in Sub-chapter 4.1, water sources in Same comprise of several already used water springs and new bore wells. Since the yield is currently being confirmed through ongoing water source investigation, the analysis below focused on possible systems layouts for different scenarios, as shown in the table below.

Table 3 - Water Source Scenarios

Same	Scenario 1 (boreholes with good productivity)	Proposed Water Sources	Merbuti, Darelau and Erluli Springs and new boreholes near Babulu tank and Letefoho North Tank
		Possible reinforcement	More boreholes near the Babulu Tank
	Scenario 2 (boreholes with medium productivity)	Proposed Water Sources	Merbuti, Kotalala, Darelau and Erluli Springs and new boreholes near Letefoho North Tank
		Possible reinforcement	More boreholes near the Babulu Tank
	Scenario 3 (boreholes with low productivity)	Proposed Water Sources	Merbuti, Kotalala, Darelau, Erluli, Cacula and Colocu Springs and new boreholes near Letefoho North Tank
		Possible reinforcement	Not applicable

Existing springs will be analysed case by case depending on the current productivity and the other current water uses. Regarding the new boreholes, the scope of the current project will consider the construction of the infrastructure needed to assure the estimate consumption for the next 10 years in scenario 1.

B. Water Storage, Treatment and Conveyance

Scenario I. At present, Same’s water supply is divided in two independent systems, one on each side of Ermetin River. In this Scenario, it is proposed that a single Water Supply System be in place.

To the north of Ermetin river, the proposed water supply system stretches between 860 masl at Erluli spring to the distribution network lower elevation at 360 masl, and from an elevation of 725 masl at Merbuti spring to the distribution network at 335 masl, south of Ermetin river.

North of Ermetin river, from the Erluli spring, a 1770 m long gravity transmission main connects to a pressure break tank near the Darelau spring. From there, a 2695 m long gravity transmission main feeds the flows, from Erluli and Darelau springs, to the WTP to be built at Holarua Tank, at 630 masl.

The treated water will be stored at the Holarua Tank and from there it will be fed by a 2580 meters long gravity transmission main to the Letefoho North Tank at 485 m elevation.

South of Ermetin river, from the Merbuti spring, a 1495 m long gravity transmission main connects to the WTP to be built at Merbuti Tank, at 615 masl. The treated water will be stored at the Merbuti Tank and from there it will be fed by:

- A 1625 m long gravity transmission main to Letefoho Central Tank at 520 masl
- A 1035 m long gravity transmission main to Posto Ground Tank - Water Tower at 565 -580 masl
- A 945 m long gravity transmission main to Manico Tank at 520 masl
- A 1755 m long gravity transmission main to Balulu Tank at 480 masl

Erro! Fonte de referência não encontrada. In 4 below is the proposed water tanks storage calculated according to the water demands projection 2040.

Table 4 - Water Tanks Capacity to be increased

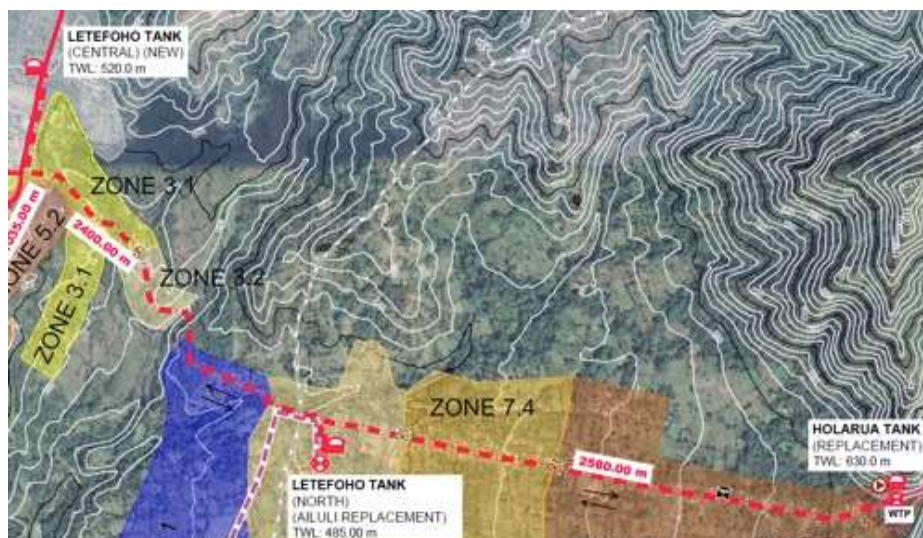
City	Tank	Zone	Storage Needed (m ³)		New Storage Proposed (m ³)	
			2020 - 2030	2030 - 2040	2020 - 2030	2030 - 2040 ^(**)
Same	Merbuti Tank	1	300	467	300	150
	Letefoho Tank Central	2	327	403	300	150
	Babulu Tank	3	312	528	300	300
	Posto - Tower Tank	4	39	78	150	-
	Manico Tank	5	128	171	200	-
	Holarua Tank	6	401	625	400	200
	Letefoho Tank North	7	321	486	300	150

(**) Reserve area for future increase capacity (considering possibility of expansion area)

The connection of the system on both sides of Ermetin river will be made by a transmission main connecting the Letefoho Central Tank and the Letefoho North Tank. It will be a reversible transmission main, gravitic flow on the Central – North direction and pumped on the North - Central direction.

It is admitted that the northerner part of the system is the one that will have the biggest problems in the dry season, because it is supplied by the springs that have smaller guaranteed yield. To allow the water to come from either the borefield near Letefoho North Tank or from the other bank of the river, to reach the Holarua Tank in the dry season, a reversible transmission main is also proposed connecting the Letefoho North Tank and the Holarua Tank.

Figure 6 - Proposed Distribution System, Reversible Transmission Main



C. Rehabilitation of the Transmission and Distribution Mains

The type of construction for transmission lines and distribution networks has to follow the design criteria, starting from the material selection, design type of trench and the operational system.

Material Selection: The following criteria regarding material selection is proposed:

Transmission Lines (HPDE and Ductile Iron):

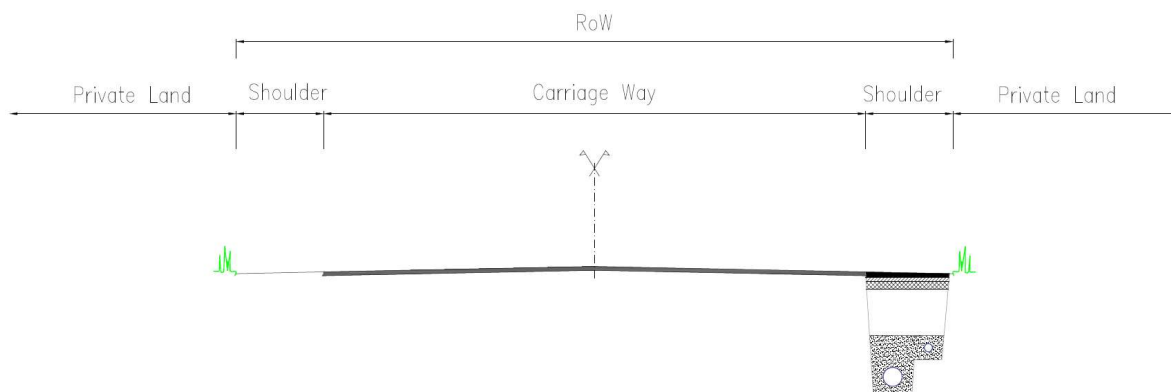
- Transmission lines with nominal pressure below 16 bar and nominal diameters below 315 mm – use of HPDE;
- Transmission lines with nominal diameters equal or above 300 mm - use of ductile iron;
- All transmission lines with nominal pressure equal or above 16 bar (regardless of the diameter) – use of ductile iron.

Distribution Network (HPDE):

- Distribution network & house service connection – use of HDPE.
- Laying of Transmission Mains and Distribution Network

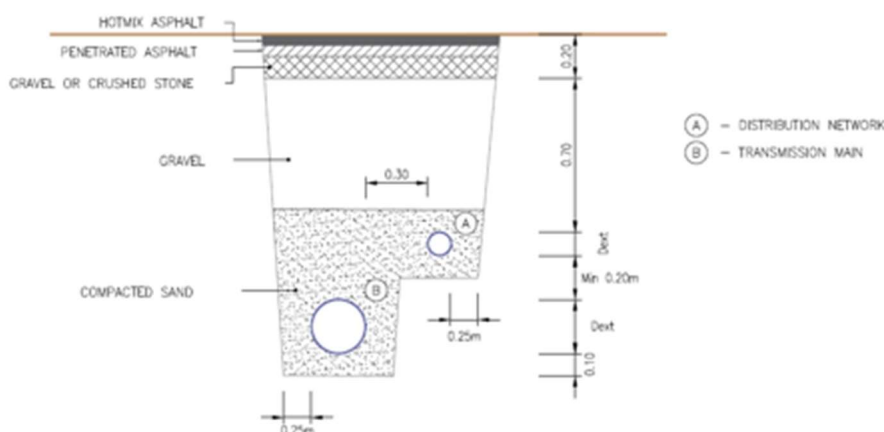
It was assumed that pipes will be implanted underground, laid along and within the road Right of Way (RoW) or outside the RoW for the purpose of replacing/rehabilitating existing pipes. Inside the city area, transmission mains will be laid below the distribution network level, as represented in 7 . in order to allow the construction of the service connections on each side of the roads without interference with transmission mains and, also, to become more difficult to do illegal connections.

Figure 7 - Laying of Transmission and Distribution Lines Along a Road. Typical Cross Sections



Typical trench details are presented in the following figure.

Figure 8 - Typical Double Trench



Transmission Mains Service

The distribution networks will be connected from water tanks. Even in situations where this option implies new network extension, the resulting benefits are significant since the operation of the systems will be facilitated and, therefore the transmission lines system will not be vulnerable to any ruptures in the distribution network.

Gravity Transmission Mains Operation

To ensure a balanced water supply to the water tanks, when a transmission main supplies more than one water tank, the connection to the tanks will be equipped with automatic control valves, which allows the flow control and will avoid the occurrence of random feeds depending on the value on piezometric head value in the pipe connection on each reservoir.

Distribution Network Pressure Zones

In each distribution zone, the pressure in the network can vary between a minimum of 10 m and a maximum of 60 m. When a water tank supplies a distribution network that has more than one pressure zone, the pressure zones will be set by Break Pressure Tanks (BPTs) or by Pressure Reducing Valves (PRVs).

Advantages of BPTs vs PRVs:

- Less maintenance break pressure tanks have a higher turn down ratio than pressure reducing valves

- Even if the break pressure tank fails, the downstream pipeline will never be exposed to excessive pressures
- A break pressure tank has fewer components than a conventional pressure reducing installation
- PRVs will leak and need maintenance at some stage. PRVs requires more skills.

Disadvantages:

- They are expensive and bulky.
- The level and flow control mechanisms are vulnerable to tampering and damages.
- Pressure is reduced all the way down to atmospheric pressure. This makes supplying areas immediately downstream at sufficient pressure difficult, which will imply the duplication of primary distribution mains since it will be necessary to install the BPT at a level that guarantees the minimum pressure value in the downstream distribution network.

4.2.2 Sanitation System

The proposed sanitation treatment sector is composed of 4 pilot test sites for public toilets (with septic tank and effluent soak pit system) and the construction of the Faecal Sludge Treatment Plant (FSTP) to receive the septage from these pilots, as well as all buildings and households located within 15 km of the Manufahi Municipal capital. According to the Master plan, it is inferred that National 2030 target for household sanitation is 100% access to hygienic toilets and improved hygiene behaviour as in consistent with the Government Resolution No. 8/2012 regarding to the Sanitation policy. The public toilets' pilot test locations will be chosen per the location and conditions of current sanitation infrastructure, users, as well as and specifically regarding schools, on the number of students, teachers and other school personnel, as well as the state of the toilet facilities.

A. Public Toilets

The proposed specifications for the Public Toilets are based on the information below:

1. Male Toilets:
 - Adult: 3 urinal stalls
 - Adult & Children: 3 latrines (each with 1.2 m²[approx.]);
 - Children: 1 small urinal
2. Female Toilets:
 - Adults & Children: 5 latrines (each with 1.2 m²[approx.]);
 - Facilities for menstruating girls.
3. Physically disabled Toilets:
 - Adults & Children: A common latrine for physically disabled person shall be provided at the centre of men's and women's section. Area of latrine with a ramp etc. for a handicapped person=3.70 m² [approx.]

The treatment of the public toilet septage is being proposed in a two-step process, as described below:

1. Primary Treatment - Septic Tank: shall have minimum width of 750 mm, minimum depth of one metre below water level and a minimum liquid capacity of 1 000 litres. Inlet: The pipe shall be fixed inside the tank, with top limb rising above scum level and the bottom limb extending about 300 mm below the top water level. Outlet – It would be fixed like inlet but shall be 50 mm below the invert of the inlet pipe.
2. Secondary Treatment - Soak Pit or Dispersion trench or Subsurface absorption system

These infrastructures will be carefully selected and designed according to the available areas, local conditions and receiving environment, based on the number of expected users and adapted to the specific local characteristics where the public toilets will be implemented.

Figure 9 - Septic Tank for up to 50 Persons Capacity

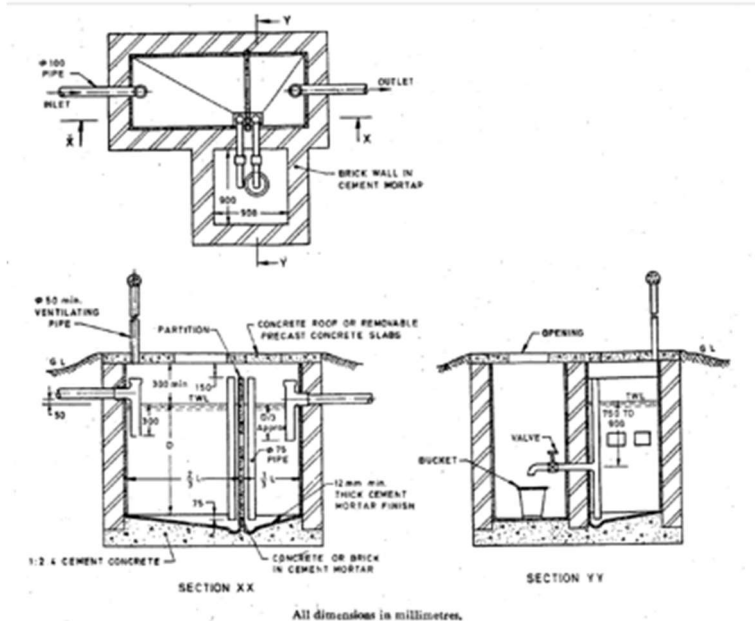
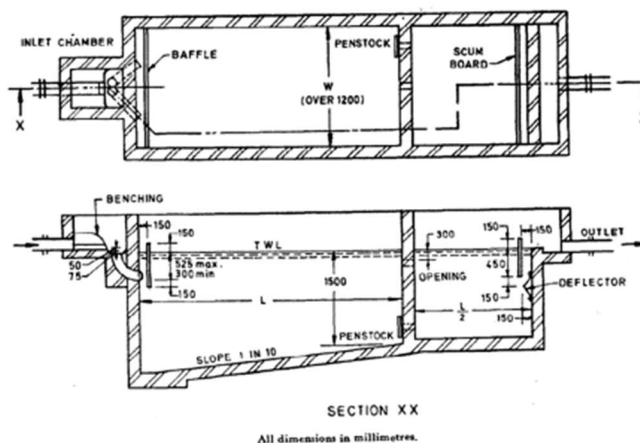


Figure 10 Septic Tank for up to 200 persons



B. Faecal Sludge Treatment Plant

The FSTP was designed considering the future users of the sanitation system up to 2040, namely public buildings, households and schools. The FSTP will be supplied with septage collected by vacuum trucks from domestic and non-domestic sources and the estimated daily volume collected in Same can be viewed in 5..Table 5 - Total Septage Volume to be Collected Daily Projections

2
0
4
0
2
.
3
7

To define the FSTP ideal/possible location, the following requirements were taken into account:

- Proposed location of FSTP shall be available within 15 km distance
- Easy road access
- The land should be relatively flat to facilitate the construction of lagoons without excessive earthworks
- The lagoons will be constructed using earthen embankments. Site is assumed to be on soil.

Given issues of planned city expansion, the proposed FSTP will be best placed in Suco Babulu (See I5), since the location fills in all the above-mentioned requirements and it is not earmarked for city expansion, according to information from the Manufahi municipality and SMASA - Same.

Figure 11 - FSTP Same proposed installation and segments

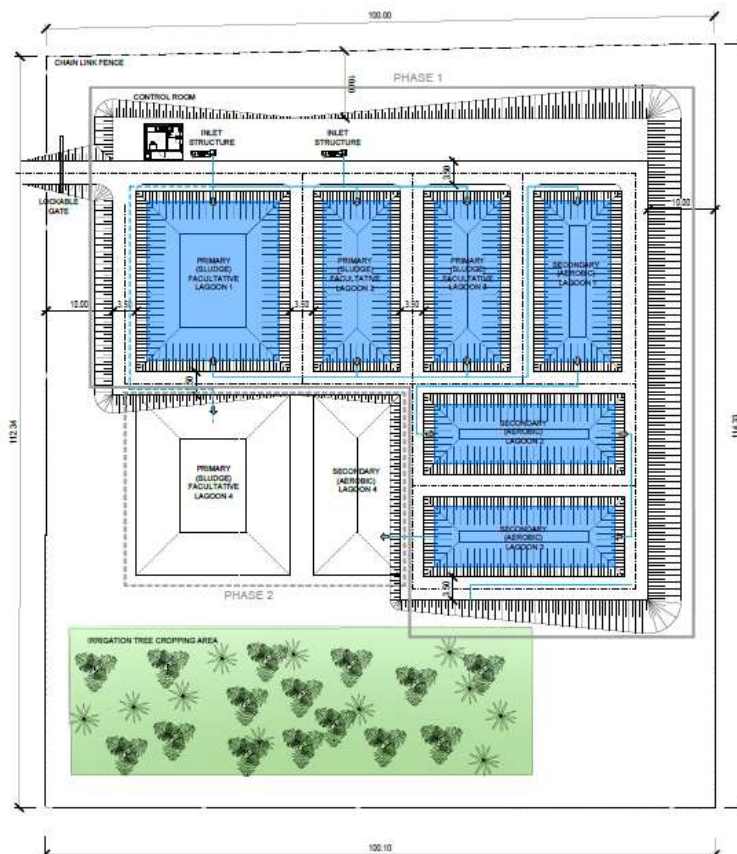


Figure 12 – Selected Location for FSTP and Characteristics of the Area

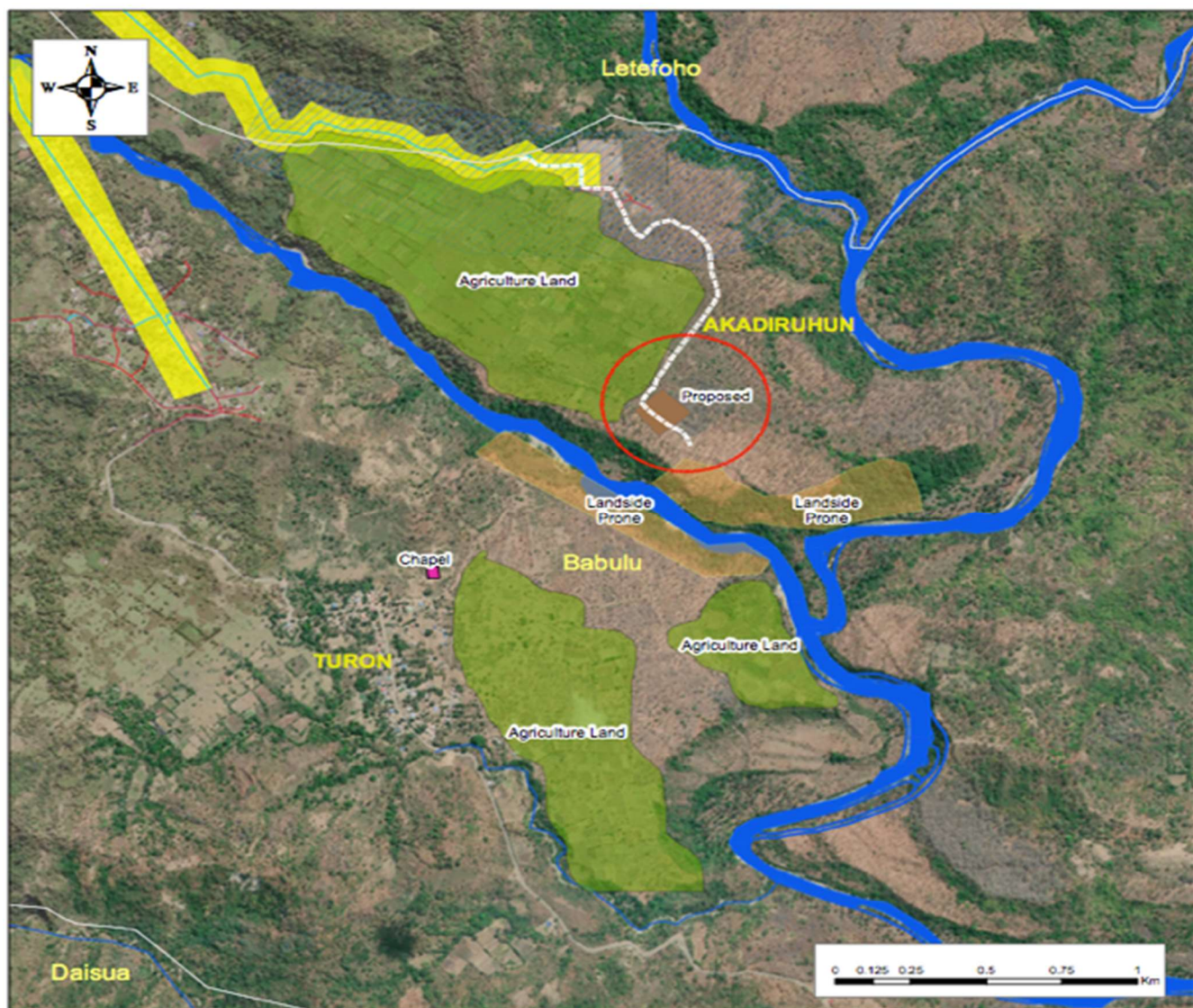


Table 6 - FSTP Possible Locations and description

5. FEASIBILITY STUDY OF THE PROJECT

This Project Document’s primary source of information for this study were (but not limited to):

- ADB Master Plan for the Second (2nd) District Capitals Water Supply Project (46160-001) TA-8064 TIM in the four Districts Baucau, Lospalos, Viqueque and Same, carried out in 2016, by the consultancy firm Aurecon;
- Baucau, Lospalos, Viqueque and Same Initial Environment Examination (IEE) and Environmental Management Plan (EMP), carried out in 2016, under Grant no. 8064-TIM from the Asian Development Bank (ADB);
- Ongoing 4 MCWSS (The Four Municipal Capitals Water Supply & Sanitation Project) IEE for Same Municipality.

A preliminary, non-in-depth feasibility study has been conducted regarding geological, hydrogeological, topography and Water study (See 7). The aim of the study is to understand the Karst System in order to define water sources, water flow capacity, geospatialize the project area and to ensure the quality of the water is suitable for human consumption.

Table 7 – Summary and Timetable of Feasibility Studies Conducted

I.I.I.I.I.I.I.18.1 Study	I.I.I.I.I.I.I.18.2 Date	I.I.I.I.I.I.I.18.3 Description Activities
I.I.I.I.I.I.I.18.4 1. Geological Study	I.I.I.I.I.I.I.18.5 -	I.I.I.I.I.I.I.18.6 Identify the local geology and geomorphology for Same Municipal as well as its geotechnical implications for the works engineering design. Given that site investigation works haven't yet started, very little information is available, essentially concerning bibliographical data coming from diverse sources, namely <i>Instituto do Petróleo e Geologia</i> , Private investigation works and scientific papers.
I.I.I.I.I.I.I.18.7 2. Hydrogeological Study	I.I.I.I.I.I.I.18.8 -	The hydrological study for existences and proposed springs still waiting for implementation date of the study.
I.I.I.I.I.I.I.18.9 3. Topography Survey	I.I.I.I.I.I.I.18.10 -	Geospatialize the project area was conducted through classic topography survey and aerial drone survey.
I.I.I.I.I.I.I.18.11 4. Water Quality Testing	I.I.I.I.I.I.I.18.12 - May 2014 I.I.I.I.I.I.I.18.13 - 27 th December 2019 I.I.I.I.I.I.I.18.14 - January 2020	<ul style="list-style-type: none"> - Water quality testing were conducted by Aurecon followed by two recent water quality testing from the National Directorate Sanitation and Water (SMASA), to identify if any, of water contamination for human consumption and record the water quality result for future if any contaminations after constructions occurs. - Types of considered parameters that were analysed are physical, chemical and Bacteriological test

6. LAND AND WATER USE

6.1 Land Use

Manufahi Municipality consists of tropical rainforest in which in the Northern and Western upstream area has a diversity of species while in the lower land area (of the project) is predominantly mix-use setting i.e urban with some rural activity, transitioning from forested areas with some stands of tropical evergreen to semi evergreen forest to dry forest.

The predominant form of livelihood for households in the project area (Same Administrative Post) is mostly near subsistence swidden agriculture for the production of primary staple crops such as i.e. maize, cassava, etc for farmer households, whilst a larger proportion of livestock activities i.e. buffalo, spread out towards the lower land areas towards Betano. The Same City Project area is located in the Southwest area of the Island, in a hilly region with an altitude range between 0m (at the Betano coast) and 1,500 m above mean sea level.

All activities will be carried out within 15 Km Diameter Project area around Same City, however it is found that some of the sub-project components are coincidentally located in a sensitive area. For Same, the existing Merbuti and Kotalala Spring system, as well as the Water Subzone 6.3 in Travessa Maunmer Leo-Faat are both located within the Kablaki Protected Area (PA) and given they are pre-existing to the project i.e. “brownfield projects” and already have working water infrastructure in the area since 2016 or before and are in a peripheral area of the PA, mitigation measures have been identified for DGAS to work with the Manufahi Municipality to reclassify these as “Zone of Use” under Decree-Law no. 05/2016 – National Protected Areas System, which allows infrastructure construction for installation of services for human use and the use of natural resources i.e. springs within the Protected Area.

In addition, designation of the location for FSTP construction would also have to consider the land status, in which the government’s property would be preferable. This requirement is accounted as part of the mitigation measures, aiming to avoid any sorts of disputes in the future between the community, project proponent and selected contractor.

6.2 Water use

The majority of the Manufahi’s population is mostly composed of farmers, consisting of 27% of the municipality population and water has been an important source for securing their activity so as to have a sustainable income. Agriculture is heavily dependent to the amount of rainfall in a given year, followed by harvesting water from nearest water stream and some of the identified springs such as Merbuti, Kotalala, and Rusata (just above Merbuti Spring).

At this moment, SMASA Same provides around 60,480 cubic meters of water per day to its population, however, the water supply has not been able to meet the growing demand for water from the consumers. The existing distribution alignments that are not quite integrated, poor condition of the pipelines, and high incidence of illegal connections are part of the main issues why the water system is currently unable to serve the Same population. As such, by refurbishing the existing network to repair leaks, increase capacity and pressure, remove illegal connections, and provide a new system of metering to streamline leak detection within the 15 km diameter of the project will be used to solve all of these issues.

The 4MWSS Project is expected to benefit a base year population of Same city of 13,770 (2020) and design year population of 24,651 (2040) by providing a reliable and adequate supply of safe and potable water.

7. ENVIRONMENTAL IMPACTS

The 4 MCWSSP is expected to have numerous beneficial and negative impacts towards the environment and social aspects due to various project activities. The potential impacts and mitigation measures assessment for Manufahi Municipality are predicted based on each of the project components, namely: 1) water sourcing; 2) treatment and storage; 3) distribution networks; 4) and sanitation sector (public toilets and FSTP), according to the project cycle (Design phase, Construction phase, Operational and Maintenance phase, and Decommissioning phase), as well as the assessment conducted in the 2015 Master plan and the recent IEE exercise.

The potential environmental impacts will occur mostly in the *Construction phase*, particularly during the civil works, but it is expected to have short term duration and mitigated. It is also essential to acknowledge the geological condition in Same Municipal i.e. landslide prone area and some sensitive areas within the 15 km of the project zone.

The evaluation of potential impacts with its nature, time scale and significance were analysed and presented in 8Summary of Potential Environmental and Social Impacts of the Project below:

Table 8 - Summary of Potential Environmental and Social Impacts of the Project

Phase	Types of Components	Potential Impacts	Nature	Incidence	Time-Scale	Significance
Pre-construction	Water quantity	Insufficient debit due to environment and social flow (illegal connection, agriculture necessity, etc)	Negative	Direct	Medium-term	High
	Socioeconomic	Water conflicts between communities	Negative	Direct	Short-term	High
	Socioeconomic	Social and ecological disruption due to project activities intruding the tara bandu and sacred area components e.g. hydrogeological study and water investigation i.e. bore well testing	Negative	Direct	Short-term	Moderate
	Water quality	Inadequate protection of intake works or wells, leading to pollution of water supply & drying up of the SMASAS boreholes & private wells due to over extraction	Negative	Direct	Medium-term	High
	Occupational health & safety	Health hazard arising from inadequate design and/or handling of facilities for receiving, storing and handling of chlorine and other hazardous chemicals	Negative	Direct	Medium-term	High
	Water quantity	Poor infrastructure and insufficient capacity of water storages can lead to impendence of water delivery	Negative	Direct	Medium-term	High
	Soil & land use	Inadequate designation of buffer zone around FSTP	Negative	Indirect	Medium-term	Moderate
	Soil & land use	Land use change for temporary sites used for contractor's camp site	Negative	Direct	Medium-term	Moderate
	Wastewater	Inadequate design causing increased volume of untreated sullage (wastewater from cooking and washing)	Negative	Direct	Medium-term	High
Construction	Noise	Increase in noise level from construction works	Negative	Direct	Short-term	High
	Air quality	Deterioration in air quality (dust)	Negative	Direct	Short-term	High
	Socioeconomic	Job creation to local community and enhance workers'skills	Positive	Direct	Medium-term	High
	Socio-cultural	Impairment to the cultural heritage properties due to pipe replacement	Negative	Direct	Short-term	High
	Vehicular access and movement of construction vehicles	Traffic hindrance and amenity value to urban dwellers	Negative	Direct	Short-term	Low
	Soil & land use	Vegetation loss	Negative	Direct	Medium-term	Moderate
	Soil & land use	Silt runoffs can cause traffic accident & increasing volume of soil wastes (spoils, spare materials, etc) can lead to possible soil contamination, attract pests and serve as vectors for disease carrying insects, and negative visual impact	Negative	Direct	Short-term	Moderate
	Occupational health & safety	Accidents and even mortality for worst scenario towards the workforces and community	Negative	Direct	Short-term	High

Phase	Types of Components	Potential Impacts	Nature	Incidence	Time-Scale	Significance
Operational & Maintenance	Water quality	Expansion of housing in the upstream with inadequate sanitation facility leading to water deterioration in the sources	Negative	Indirect	Long-term	High
	Wastewater	Inadequate management of the treated sludge from the FSTP causing odour and excessive plot space consumption	Negative	Direct	Short-term	Moderate
	Water quantity	Achieve consumers water demands for consumption	Positive	Direct	Long-term	High
	Water quality	Water quality deterioration due to inadequate chlorination and irregular water quality testing	Negative	Direct	Short-term	High
	Occupational health & safety	Health hazards due to chlorine exposure	Negative	Direct	Short-term	High
	Public Health	Improvement of community's health and reduce mortality due to clean water and sanitation access	Positive	Direct	Long-term	High

7.1. Biophysical impacts

7.1.1. Water Quality

- It is expected that in Same, the sub-project component of water source will have an inclination to water quality degradation.

From an analysed case in the Merbuti system, the upstream supposedly in the Kablaki Protected Area is composed of human activity and poor sanitation infrastructure majorly with no septic tanks, which can consequently lead to bacteriological contamination in the downstream. It is in fact that the slash and burn activity is a low-cost, sole and dependable mechanism used by the local community for agriculture needs and happens very frequent before entering the wet season, which has an immense impact to the water spring quality and availability yield.

Construction works of pipe replacement due to trenching, water storage remodelation and FSTP installation would likely generate silt run offs and therefore enter the nearby surface water i.e. river and drainage system that ends in the water body, if temporary drainage system is not applied. However, the said activity won't give adverse impacts to the water ecosystem and the duration is considered temporary in nature as long as the flow is not unceasing.

To preserve the environmental and social sustainability of the proposed water distribution system, hence it is duly planned for protection program, as described below:

- Implementation of Upstream Watershed Protection Programs, with restriction to water quality impacting activities i.e. animal husbandry, slash and burn, etc;
- Improvement Program for all existing and future dwelling sanitary infrastructure i.e. SMASA septic tank design template, in the community surrounding the water source;
- Involve the Lia na'in and communities for cultural ceremony preparation and Tara Bandu protection of the source, to avoid conflicts and distribution interruptions (also applicable to "Water Sources in Protected and Sacred Areas");

7.1.2 Air quality and noise

Based on the 2016 Master plan, no measurement of air quality and noise level have been made within the project site. However it was observed that in the construction activities will likely to produce more negative impacts towards the environmental stability and also the local community.

The negative impacts generated are considered temporary, from the arising of noise and air pollution that causes disturbance to the nearby dwelling and commercial buildings, construction waste (solid and liquid), traffic, flood due to lacked of outlet system and slope instability. The health and safety risk of the workers, declining of the water quality, soil erosion, etc. are also considered as main impacts.

Earthwork construction, stockpiling of natural aggregates, transport loading and unloading, heavy vehicles mobilizing, tend to generate dust and its dispersion, thus distracting the aesthetic of the environment and inhabitants living nearby the project site. Dust exposure will affect the respiratory system and eye visioning. Dust generation is considered a temporary negative impact on the air quality as the fuel emission from the heavy machineries will not have a significant negative influence as well.

- a.
- b.
- c.

The project will include various heavy machineries and vehicles to be operating during this phase, such as demolition works, movement of trucks and equipment, earthworks, concrete mixing, loading and unloading

construction materials. These types of activities correspond to the potential impact of noise emission. The said impact will be very significant in areas of noise-sensitive institutions or buildings such as health care and educational facilities. The parameter of noise level will be in adherence to WHO noise level guidelines since there has not been any national standards for noise established.

Mitigation measures to be taken:

- a. Limit engine idling duration
- b. Avoid or limit noisy works during night time
- c. Reducing speed limit in the work site will also minimize noise emission

7.2. Socio Economic Impacts

7.2.1 Health and Economic Impacts

The 4 MCWSSP is expected to have numerous beneficial and negative impacts towards the social aspects due to various project activities. For community health, they will be moderately exposed to the result of air and water contamination, noise nuisance, mobility of heavy vehicles, goods and services, economic and social disturbances, etc. Communities are also potential to spread communicable diseases.

Therefore, some mitigation measures to be taken:

- d. Proper traffic or road signage and warning signs;
- e. Protect the community from physical, chemical or other hazards associated;
- f. Disseminating information through conducting seminar or workshop

On the other hand, some major positive impacts will directly affects by the network improvement works such as large numbers of shops, businesses, industries, and other economic activities. For Same, based on the field identification the network itself is located in roadways, therefore the people and commercial activities will unlikely to be disturbed as the work will be carried out on individual short lengths of the network, thus the period of construction in each section area will not last long.

Nevertheless, there can be economic impacts if roads have to be closed for short periods and customers are unable to gain access to shops, or if trenches are constructed near the sides of roads, and customers are impeded by the presence of trenches, excavation, workers and machineries. Although resulting losses in income will be small and short-lived, except for small traders and businesses exist on low profit margins.

The water supply system repair and improvement in the Municipality of Manufahi is aimed to alleviate the district's populace from their present economic condition where people will be opened to economic activities with an influx of investors. The whole district is expected to get 24/7 access to clean and potable water; therefore, health condition, sanitation and hygiene practices of the people will improve.

7.2.2 Socio-Cultural and Heritage Buildings

Same society follows (with slight local variation) in line with the general indications of those practiced in Timor-Leste, where the sacred or *Lulik* plays a central role in their contemporary social relationships and community, especially in what regards agricultural management and conservation of resources and lulik areas appear in more disperse but nevertheless important symbols such as trees or water sources.

During the site visit, the team identified and received information from the Chefe Sucos related to historical and other cultural sites which lie nearby the distribution alignments which are listed on. These traditional regulations and customs in Timor-Leste also contribute to conserving the natural resources such as forests and crops, a communal protection system known as Tara bandu. It is an agreement within a community to protect a special

area or resource for a period of time, usually carried out for the harvest of agricultural produce, cutting of trees or collecting of forest products, and hunting or fishing but is also currently being used to regulate social behaviour or protection of cultural locations.

There are several types of symbolic actions used for this practice. In agriculture, objects may be hung near or a piece of rattan tied around the trunk of specific trees or next to a garden to indicate custodianship of the resource. It is also widely believed that people who steal the goods subject to Tara bandu may suffer from an accident, misfortune or illness, while the Tara Bandu itself also provides for mediation of land disputes.

Table 9 - Identified Cultural, Historical & Touristic Sites in Same

No.	Name of Site	Type	Coordinates
1.	BNCTL office & other old buildings	Heritage	9°00'02.59"S 125°39'09.20"E
2.	Old Church Hatumera & Cemetery	Heritage, socio-cultural	9°00'12.80"S 125°38'27.94"E
3.	Traditional House 1	Socio-cultural	8°59'28.99"S 125°39'49.53"E
4.	Erlesu pool	Touristic	8°57'01.04"S 125°38'59.28"E
5.	Mosque	Heritage	9°00'37.40"S 125°38'46.11"E
6.	Church 1	Socio-cultural	8°59'55.97"S 125°38'53.30"E
7.	Evangelic Church	Socio-cultural	9°00'24.68"S 125°38'54.40"E
8.	Church 2	Socio-cultural	9°00'21.65"S 125°38'54.10"E
9.	Religious cave nearby Merbuti spring	Heritage, socio-cultural, touristic	8°59'50.76"S 125°37'25.27"E
10.	Chapel in Turon	Socio-cultural	9°01'59.41"S 125°39'49.53"E
11.	Chapel in Seamrema	Socio-cultural	9°00'54.23"S 125°38'30.46"E
12.	Traditional House 2	Socio-cultural	8°59'37.34"S 125°40'1.76"E
13.	Traditional House 3	Socio-cultural	9° 0'45.48"S 125°39'14.84"E
14.	Traditional House 4	Socio-cultural	8°59'43.93"S 125°38'11.82"E
15.	Monument - Tank	Heritage, touristic	8°57'43.10"S 125°39'24.03"E

Socio-cultural and heritage building above mentioned are adjacent to the distribution alignment (fig. 5) in which contractor should be aware of during the construction phase so that it will not damage or interfere to the heritage building as according to decree law no. 33/2017 state that for immovable assets should have a protection zone of 50 metres radius and to assure that the environmental will be assed in order to established mitigation measures into account.

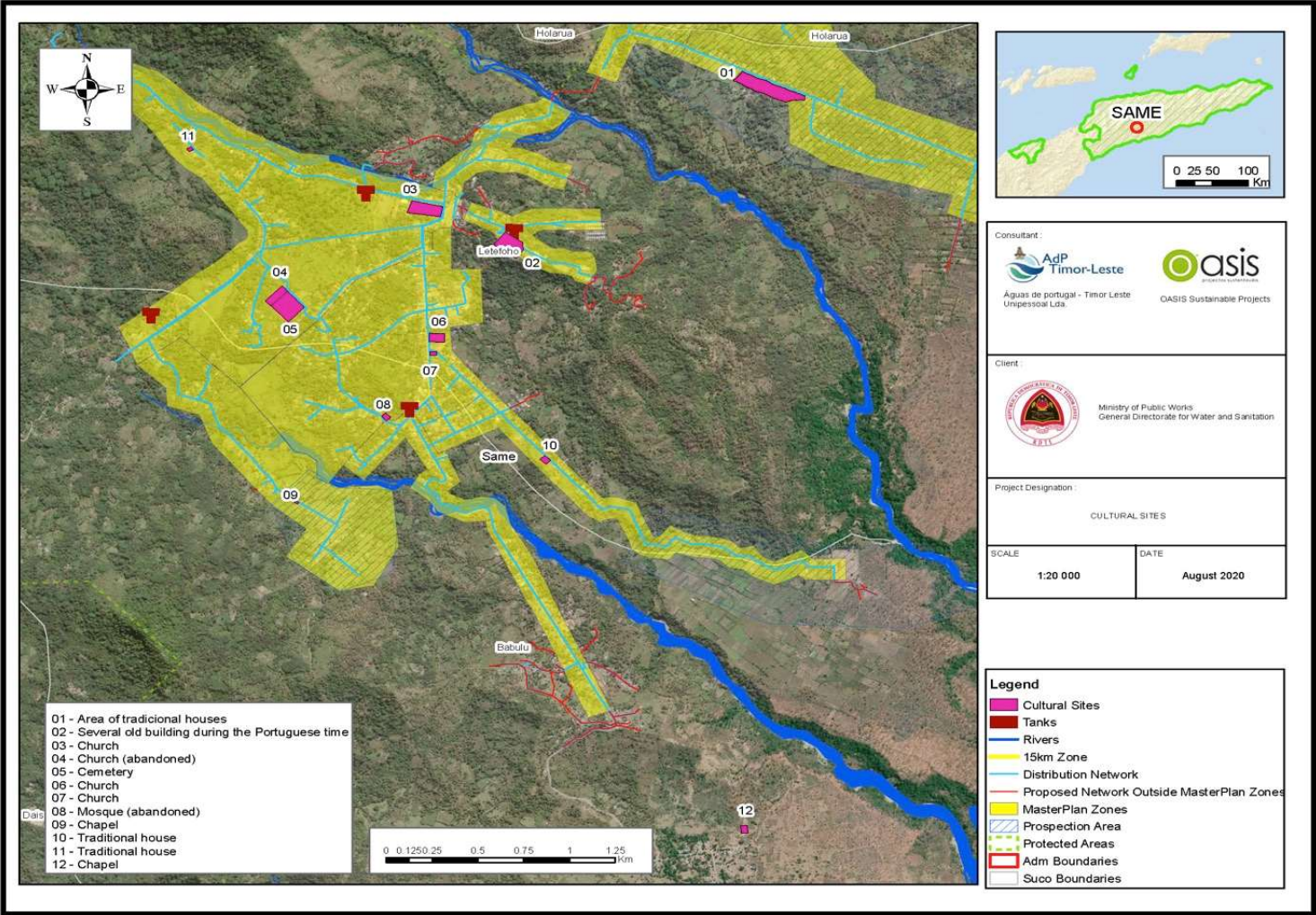


Figure 13 - Location of Cultural Heritage Sites Identified within the Project Area

8. PUBLIC CONSULTATION

The ADB IEE (ADB, 2020) undertook Public Consultation for Same in the Municipal Administrative Meeting Room on the 12th of October 2020 and was participated by local government agencies and authorities (Chief of Suco and Village), and representative members of the communities within the project area, where the issues of significant social concern, its predicted environmental impacts and proposed mitigation measures were presented, in order to collect all useful and relevant inputs from them, for the project construction phase.

The stakeholders gave their concern, suggestion and recommendation for the project implementation, focussing mainly on the need for the project, such as:

- i. Land & Property;
- ii. Acceleration of the Project Implementation;
- iii. Project Area;
- iv. Water distribution system that does not cover or serve all villages;
- v. Misuse by consumers (and direct impact on water availability in the distribution system and
- vi. Measurement for structural preservation of cultural and religious assets within the project area.

The technical team responded to the raised issues according to the provided design and Government's strategic development plan specifically on improving clean water consumption.

It is also observed that during the consultation no issues of significant social concern or objections about the proposed project were raised and stakeholders were positive about the proposed project and expecting for this project to be implemented as soon as possible, since they are facing crucial issues on water for daily consumption and don't want to repeat uncertain schedule for water delivery into the households in the future.

In any cases however, if the Environmental Regulator sees the need for the project to carry out public Consultation under the environmental framework law, for a category B project process, the Proponent will do so as indicated in the Decree-Law and respective Ministerial Diplomas.



Figure 14 - Same Public Consultation; participation of the Local Community and Other Stakeholders.

9. CONSULTATION WITH OTHER AUTHORITIES

Since the beginning of the 4 MCWSS project, it has been accompanied by various entities and stakeholders throughout several meetings to inform and gain understanding of the issues faced in Timor-Leste, especially in 4 municipal capitals in terms of land acquisition, water source and its distribution and cultural heritage sites.

Some of the various consultation meeting are highlighted below for their importance in terms of the project implementation process and to clarify on the communication process with Relevant Stakeholders.

- 2020 July 1st- 3rd – Meeting with Manufahi’ s municipalities entity

The consultation meeting with Manufahi’ s entity was conducted from the environmental team from the consultant during the site visit. The meeting took place in SMASA (Direção Nacional de Serviços de Aguas) office in Suco Holarua between Manufahi SMASA director and technicians, representative from three different sucos namely Letefoho, Babulu and Holarua with the environmental team from the consultant ().

The main purpose of the consultation was to inform and explain to the local authorities about the 4 MCWSSP and get the formal information about cultural site and also protected area that need to take in account. On the other hand, the environmental team from the consultant also asks their recommendation about FSTP (Faecal Sludge Treatment Plan) location and the local authorities also lead the team to visit the project site to identify and mapped several cultural heritage sites which lie very close to the water distribution alignments.



Figure 15 - Brief Meeting with SMASA Director and representative from local authorities

- 2020 July 06 – Meeting with Director General of DGAS (Direção Geral Agua e Saneamento)

This meeting was conducted between the representatives of the consultant team AdP / Engidro, Oasis and Director General of DGAS. The main purposes of the meeting was to discuss issues regarding

1. Illegal water connections;
2. Laying water pipeline and
3. Coverage area of Water Supply & Sanitation subprojects.

- 2020 August 28 - Consulting contract services for DED of 4 MCWSS Project – Design Development update (Conference Call meeting)

This conference call involved the consultant team from AdP / Engidro as a lead consultant and Consultant subcontract Oasis represents by OASIS Environmental Specialist. Several issue regarding the identification of the land ownership, topographic survey, and public consultation were discussed during the meeting. The team also identify an action points to follow in the upcoming activities.

- 2020 September 22 – Meeting with the Secretary of State for Arts and Culture

Another consultation meeting was also conducted between the representative of Secretary of State for Arts and Culture and Oasis team which was represented by the National Environmental Technician. The meeting took place in Secretary of State for Arts and Culture Office in Pantai Kelapa.

The objective of the meeting was to request cultural heritage sites data in all 4 Municipals in adherence to a request letter sent from the General Directorate of Water and Sanitation Service (DGAS) with a reference number 172/C50605/Gab.DGAS/MOP/VII/2020. This is aiming to identify whether or not the sites are located adjacent to the project components and how they will impact on the related sites.

- 2020 November 09 – Consulting contract services for DED of 4 MCWSS Project – Update the progress of the project to PMU (Project Management Unit);

The meeting was conducted via conference call between PMU, AdP TL and Oasis representative. The main purpose of the meeting was to

1. Confirm and discuss the outstanding issues from the last meeting dated on 28/10/2020;
2. Update the progress of the field work activities and revised the workplan and
3. Request PMU guidance related to several considerations made in Preliminary Design Report.

10. PROPOSED CLASSIFICATION OF THE PROJECT

10.1 Background and Justification

The Detailed Engineering Design (DED) for water supply and sanitation improvements in the municipalities of Baucau, Lospalos, Same and Viqueque financed by the Infrastructure Fund of the Government of Democratic Republic of Timor-Leste with all enumerated infrastructure components, a total of USD\$ 70,404,273 estimated project cost. The preliminary cost of the 4MCWSSP for Manufahi Municipality only is estimated around \$15,782,456 for proposed water supply and sanitation expenses. This estimated cost is based on the previous Master plan Design prepared under the Second District Capitals Water Supply Project (46160-001) ADB TA-8064 TIM, January 2016, planned to rehabilitate the existing water supply system in the four districts.

The project's main objective is to guarantee that the overall balance of environmental and social impacts results in positive outcome, taking into special consideration the mitigation commitments in the Environmental Management Plan, the compliance with the RDTL environmental assessment process and especially given the project's special relationship with the institution's technical assistance support.

In 2015, under the ADB TA, for the Same area the project was classified at the time as follows: "Since the project is under the classification as Category B, the procedural steps are discussed..." (ADB, 2016).

Viewing the city of Same as the project as a whole, with the inclusion of all components of Water Distribution and Sanitation, the project would most likely to be reclassified as considering that some of the project components are within the Kablaki protected Area, namely Kotalala, Merbuti and Rusata Springs (even though individually, these springs do not achieve the Category A threshold), as well as a small water distribution area in Zone BI, Suco Holarua, rendering the project automatically in a Category A, under "XII. Location Factors - ...Protected Areas...".

However, the mentioned protected area will be proposed to the government entity for establishing and classifying as land use area, followed by the National Protected Area System Regulation Article 32 item 1 & 2. This should also be applicable for the two springs in the Merbuti system.

10.2 Categorization Request

Given that the project was not likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented, or that potential impacts are unlikely to affect areas larger than the sites or facilities subject to physical works, meaning the impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed to for them, **the proponent hereby request the Environmental Regulator to consider a Category B for this project**, in accordance with the Regulator's choice of classification prerogative outlined in item 2 b) of article 4 of Decree-Law no. 05/2011 (GovTL, Decree-Law no.05/2011 -Environmental Licensing, 2011).

The estimation of classification for the project was done in accordance with the project component scale, as well as the scope referenced in the Second District Capitals Water Supply Project (ADB, 2016). It has been done with regards to the requirements of Decree-Law no. 05/2011 – Environmental Licensing, the ADB Safeguard Policy Statement (2009).

This is also mostly due to the project's reduced impact nature as "...the upgrading and rehabilitation of an existing water supply system..." i.e. a pre-existing "brownfield" project, also reflected in previous Category B classification decisions from the Environmental Regulator, of similar WATSAN capital cities projects such as Pante-Macassar and Manatuto (See Appendix 2).

II. EXECUTIVE SUMMARY

The Four Municipal Capitals Water Supply & Sanitation Project (4MWSSP) is based on the previous Master plan Design to support the Government of Timor-Leste in providing access to improved water supply and sanitation (WSS) in 4 municipalities (Baucau, Los Palos, Viqueque and Same) financed by the Infrastructure Fund of the Government of Democratic Republic of Timor-Leste with all enumerated infrastructure components, a total of USD\$ 70,404,273 estimated project cost. ^[1]

The primary objective of this Project Document' s is to provide clear and relevant information on the proposed Water and Sanitation System Improvement Project for **Same City only**, taking into account that its rehabilitation will be carried out under a future ADB loan to the Government of Timor-Leste. The preliminary cost of the 4MCWSSP for Manufahi Municipality is estimated around \$15,782,456 for proposed water supply and sanitation expenses. It will include all the areas that will be required to implement the Abstraction, Treatment and Distribution of Water for Human Consumption, as well as provide designs and solutions for Sanitation for Buildings, Schools and Housing within a diameter area of 15 Km around the city. The 15 Km range area encompasses 7 sucos in total, for developing Water and Sanitation infrastructures.

The 4 MCWSSP is expected to have numerous beneficial and negative impacts towards the environment and social aspects due to various project activities. The project also will provide improvements and opportunities in several ways regarding employment generation, skill enhancement, improved Health and Hygiene as well as Women empowerment. Furthermore, it will directly generate employment opportunities either skilled or non-skilled work for the local people. This type of employment opportunities will increase the skill of the workforce in terms of technical proficiency. By the end of the project, safe and reliable water supply will be provided to the municipal town (sucos and aldeias), and all households will have improved hygienic toilets as well as toilets available in public places. The improved water supply and sanitation facilities in the pilot schools will provide children with safe and reliable water supply and toilets operated by competent operators in each pilot school, providing a template in other schools to improve water supply and toilets.

To improve the efficiency, transparency and public involvements, the consultant conducted the Public Consultation for Same in the Municipal Administrative Meeting Room on the on the 12th of October 2020 and was participated by local government agencies and authorities (Chief of Suco and Village), and representative members of the communities within the project area and was participated by local government agencies and authorities (Chief of Suco and Village), and representative members of the communities within the project area.

On the other hand, the stakeholder consultation conference regarding the environmental aspect of the project was also conducted on March 20, 2015 to inform proposed project to the stakeholders, solicit issues and concerns from the people regarding the project and their existing water supply and the anticipated environmental impact of the proposed project and to gather people's opinion on how to improve their water supply system.

The estimation of classification for the project was done in accordance with the project component scale, as well as the scope referenced in the Second District Capitals Water Supply Project. While all projects funded by ADB and IFC must comply with their Safeguards to ensure that projects are environmentally sound, designed to operate in compliance with applicable regulatory requirements, and are not likely to cause significant environmental, health, or safety hazards, in Timor-Leste, environmental screening and categorization follows suit but is also dependant on project component and scale comparison with Decree-Law no. 5/2011 – Environmental Licensing, particularly Annex I – Category A (EIA) or Annex II – Category B (IEE) thresholds.

Through all preliminary review, it was concluded that, overall, the project was not likely to have significant adverse environmental impacts and in most cases mitigation measures can be designed to for them, which,

under the ADB and IFC guidelines, places categorisation under a Category B, requiring an IEE process of evaluation for Baucau, Los Palos and Viqueque. However, given to Same, which may differ due to sensitive locational issues i.e. Pre-existing components in Protected Areas i.e. Mount Kablaki Protected Area. A Category B may possibly be attributed pending confirmation of land use reclassification.

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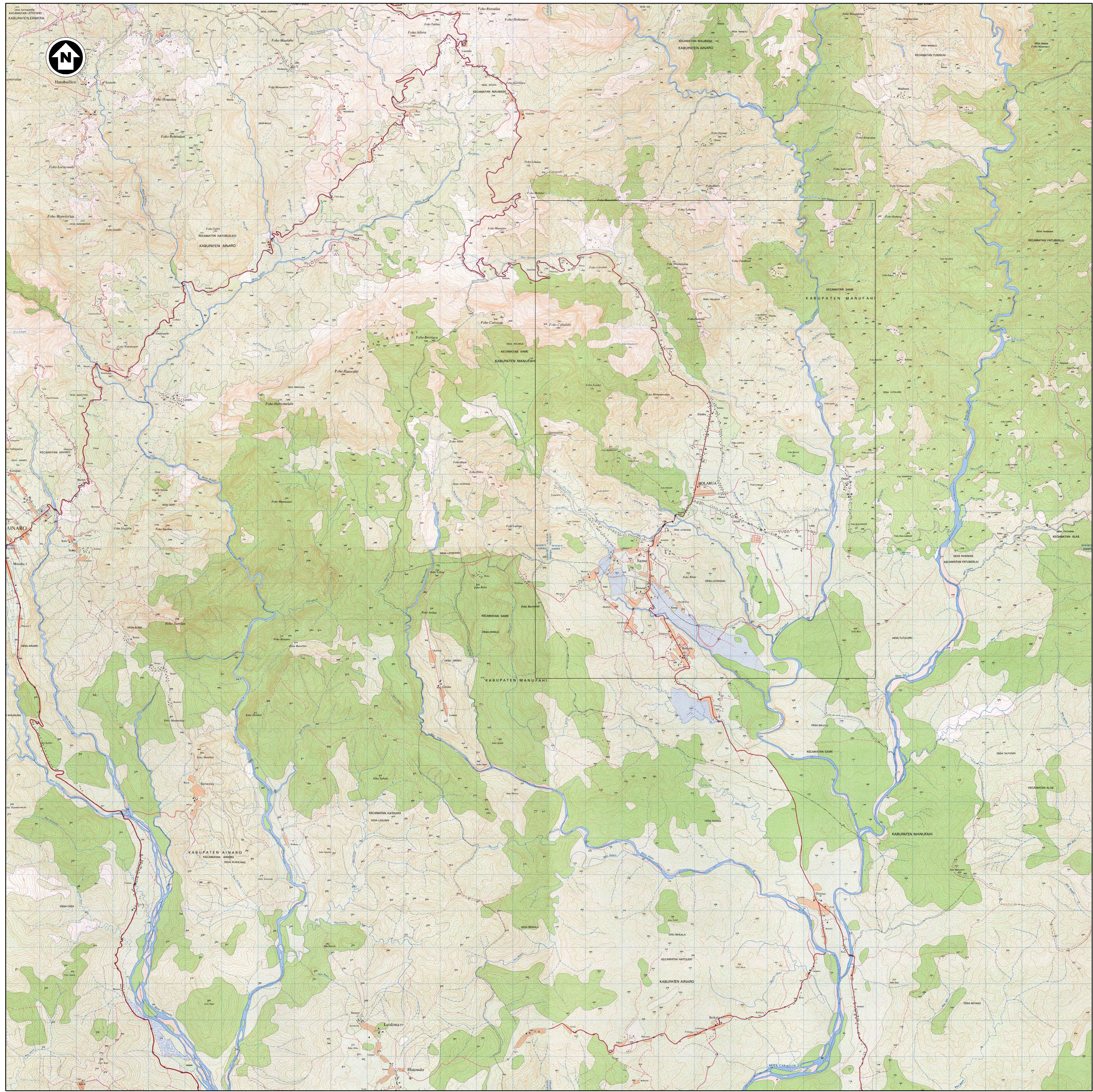
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13. APPENDIXES

Appendix I. Geographical Map of Project Location



DEPLOYMENT AREA
Scale:1/50 000



LOCATION
Scale:1/2 500 000

REMARK: SCALE 1:50 000 AT A1; SCALE 1:100 000 AT A3.

0	FIRST VERSION	08/2020
REV	DESCRIPTION	SIGNATURE / DATE
CONSULTANT		
ÁGUAS DE PORTUGAL - TIMOR LESTE UNIPessoal Lda.		
CLIENT		
Ministry of Public Works General Directorate for Water and Sanitation		
GENERAL DIRECTORATE FOR WATER AND SANITATION		
VERIFICATION / DATE	APPROVAL / DATE	AGENCY OF NATIONAL DEVELOPMENT
VERIFICATION / DATE	APPROVAL / DATE	APPROVAL / DATE
DESIGN		
Consulting Services for Detailed Engineering Design of Timor-Leste Four Municipal Capitals Water Supply & Sanitation Project		
STAGE		
D4 - Preliminary Design Report		
ENGINEERING SPECIALTY	DATE	SCALES
General Design	07/2020	1:50 000 / 1:2 500 000
PROJECT Nº	DRAWING	VERIFICATION
TITLE		
SAME		
General Plan		
PROJECT Nº	FILE	DRAWING Nº
E1391	E1391_D4_SA_01	SA.01
SHEET Nº	REVISION	
1/1	0	



Appendix 2. Environmental License ADB 0258-TIM Project – Manatuto District



REPÚBLICA DEMOCRÁTICA DE TIMOR-LESTE

**National Directorate for Environment, State Secretariat for Environment,
Ministry for Commerce, Industry and Environment**

ENVIRONMENTAL LICENSE

Issued under Decree Law on Environmental Licensing No. 05/2011

In accordance with decision dated on 07th August 2014 by the **State Secretary for Environment** Mr. Numinando Soares Martins "Buras" Approved the Simplified Environmental Impact Statement. Hence, pursuant to the Chapter VI of Decree Law on *Environmental Licensing 05/2011* (Decree Law 05/2011), and Issued Environmental License for the activity referred to the Schedule below which subject to the conditions contained in the Annex.

Schedule

Proponent of Project:	National Directorate of Water Supply Services
Date Submitted Application:	20th of March 2014
Application Number:	20/ AIA-DNMA /XI/ 2013
Environmental License Number:	06 / C:B-5 / SSE-MCIE / VIII / 2014
Activity Scale:	Distance 15.09 km(Transmission pipe 15090m and distribution pipe 68741m; maximum depth 1m)
District and Sub-district:	Manatuto
Category of Project:	Category B
Project:	Upgrading and Rehabilitation of Existing Water supply
Date of Notification:	07th of August 2014

Notes

1. This Environmental License is non-transferrable in accordance with Articles 22 (4) of Decree Law 05/2011.
2. Proposed changes to the project affecting environmental impacts or the project area/size, or relocation, are subject to technical review and approval in accordance with Chapter VIII of Decree Law 05/2011.
3. Appeal rights are governed by *Decree Law 32/2008 on Administrative Procedure*.
4. The Proponent is solely responsible for ensuring all other necessary renewal license, permit, authorisations or recommendations are obtained from relevant government authorities.

5. The Proponent is responsible for ensuring that all subcontractors or others carrying out works associated with this Environmental License comply with the SEIS, EMP and terms of this Environmental License.
6. All future communications, documents and reports prepared by or on behalf of the Proponent in relation to the Project and submitted to the National Directorate for Environment ('DNMA') shall be in both Tetum and English, and in both electronic and hard copy.

Annex - Conditions of Environmental License

The conditions contained in this Annex are to protect the environment and to mitigate the environmental impacts of the Project.

General Conditions

1. Project in accordance with initial environmental examination documents, and future environmental licenses

- 1.1 The District Capital Water Supply Project must be conducted in accordance with the Final Report of Simplified Environmental Impact Statement (SEIS) prepared by Project Implementation Unit Consultant dated 20th of March 2014 and the incorporated Environmental Management Plan (EMP), except as modified or amended by this Environmental License.
- 1.2 The Expansion, Rehabilitation and operation and maintenance of Manatuto Water Supply Systems must be conducted in accordance with Asia Development Bank Safety Environmental Principle.
- 1.3 The Nature, Size, Location and Importance of the Project, described on page 12 – 15 (5.1-5.2) of the SEIS, strictly states the Project Site Boundary for all development and construction activities related to The District Capital Water Supply Project.
- 1.4 To successfully implement the EMP the SEIS has given adequate instructions for the Project Implementation Unit (PIU) to monitor and report environmental compliance all through the project implementation period.
- 1.5 As planned in the SEIS this Water Supply Project is given the Environmental License granted for two (2) years starting from the Date of the Notification mentioned in *Licensing*
- 1.6 Any proposed changes, alterations or additions to the Project that the Proponent wishes to undertake that are not consistent with the SEIS and EMP and this Environmental License will require an additional Environmental License or amendment of this Environmental License, in accordance with relevant provisions of *Decree Law 05/2011*.
- 1.7 DNMA may review and alter any conditions in this Environmental License, including by requiring alterations to the Environmental Management Plan, to respond to any proposed changes to any component of the Project through any application made by the Proponent to DNMA relating to the Project, if DNMA deems it necessary to do so to protect the environment.

Additional requirements and modifications

2. Construction phase

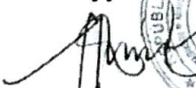
- 2.1 When the activity starts, community near the area of the project must be included to offer them jobs in which could help minimize the social impacts.
- 2.2 The proponent must coordinate with other institution that related to this activity before implementing the project.
- 2.3 For air quality related to dust, inspection should be done to ensure that residents living along the construction route are not affected. Hence spreading water will help minimize dust emission close to the residential areas;
- 2.4 The proponent must assure that water bodies nearby are safe from siltation and contamination that includes fuel and lubricants used in the rehabilitation of the water supply project;
- 2.5 The proponent must enforce the disposal of surplus material at environmentally safe disposal/ fill sites and that spoil stockpiles are managed properly;
- 2.6 Soils from the excavation must not be disposed of near the water bodies, paddy field, Farmland and community's residential area along the road rehabilitation route;
- 2.7 Sites where rocks and sands are excavated should be 20 meters away from the river bank;
- 2.8 Avoiding excavation of soil and stone in the sensitive environmental areas (protected area/ Forest, potential landslides field, high elevation hills, etc);
- 2.9 When the project is complete, excavated areas must be rehabilitated, materials dumping, Facilities for staff and logistic installed must be demolished and managed it properly;
- 2.10 Actively monitor the water bodies that are close to the construction site during the Rehabilitation process;
- 2.11 The community from the residential areas, horticulture, paddy fields, And other types of farmlands and agricultural plantation whom are affected must be Given compensation in a fair and just manner;
- 2.12 Avoiding in necessary eviction. If any target household need to be remove, please Negotiate in fair manner and applying prior consent principle
- 2.13 During the rehabilitation activity, noise from the excavator must be controlled, need to Install appropriate warning signal for safety traffic, for the safety of worker and road Users;
- 2.14 Trucks carrying construction materials (sand, stones, cement etc) must be covered by Tarpaulin to prevent materials from falling off of the trucks;
- 2.15 Alternative roads must be built to ensure that public transportations are not delayed during the rehabilitation;

- 2.16 Rehabilitate eroded areas that caused by the construction activity;
- 2.17 During daytime construction site should be sprayed with water every three hours each day along the Rehabilitation project route;
- 2.18 Prepare disposal site for solid and liquid waste from the construction activity, excavator and trucks; except dangerous waste (oil ,lubricant and so on)
- 2.19 Worker and staff compound close by community village must be develop in coordination with local leaders and the residence. Worker and staff need to respect local people, ritual, symbols of believe and cultures;
- 2.20 Need to apply local content principle for the involvement of local people in working Opportunity and possible local material procurement;
- 2.21 Indentified appropriate location for material (sand, stone, wood, water and other material) collection;
- 2.22 Due to the instability of soil, high elevation of the areas and impact of climate change (more rain or less rain could cause erosion), there is need to have bio engineering expert in providing knowledge and techniques to community for re-vegetation and reforestation;
- 2.23 The Proponent must ensure that the waste is disposed of at disposal area;
- 2.24 After the project is finally done, the company is responsible to clean up all the waste and piles from the construction activity along the project route.

National Directorate of environment will be supervision and oriented company refer to the Environment License and Environment Management Plan.

Dili, 07th of August 2014

Approved by:



Numinando Soares Martins "BURAS"
Secretary of State for Environment



Appendix 3. Environmental License ADB 0258-TIM Project – RAEOA



REPÚBLICA DEMOCRÁTICA DE TIMOR-LESTE
National Directorate for Environment, State Secretariat for Environment,
Ministry for Commerce, Industry and Environment

ENVIRONMENTAL LICENSE
Issued under Decree Law on Environmental Licensing No. 05/2011

In accordance with decision dated on 07th August 2014 by the **State Secretary for Environment** Mr. Numinando Soares Martins "Buras" Approved the Simplified Environmental Impact Statement. Hence, pursuant to the Chapter VI of Decree Law on *Environmental Licensing 05/2011* (Decree Law 05/2011), and Issued Environmental License for the activity referred to the **Schedule** below which subject to the conditions contained in the **Annex**.

Schedule

Proponent of Project:	National Directorate of Water Supply Services
Date Submitted Application:	20th of March 2014
Application Number:	20/ AIA-DNMA /XI/ 2013
Environmental License Number:	06 / C:B-5 / SSE-MCIE / VIII / 2014
Activity Scale:	Distance 6.7 km(Transmission pipe 6768m and distribution pipe 39615m; maximum depth 1m)
District and Sub-district:	Pante Macasar, Oecusse
Category of Project:	Category B
Project:	Upgrading and Rehabilitation of Existing Water supply
Date of Notification:	07th of August 2014

Notes

1. This Environmental License is non-transferrable in accordance with Articles 22 (4) of Decree Law 05/2011.
2. Proposed changes to the project affecting environmental impacts or the project area/size, or relocation, are subject to technical review and approval in accordance with Chapter VIII of Decree Law 05/2011.
3. Appeal rights are governed by *Decree Law 32/2008 on Administrative Procedure*.
4. The Proponent is solely responsible for ensuring all other necessary renewal license, permit, authorisations or recommendations are obtained from relevant government authorities.
5. The Proponent is responsible for ensuring that all subcontractors or others carrying out works associated with this Environmental License comply with the SEIS, EMP and terms of this Environmental License.

- 6 All future communications, documents and reports prepared by or on behalf of the Proponent in relation to the Project and submitted to the National Directorate for Environment ('DNMA') shall be in both Tetum and English, and in both electronic and hard copy.

Annex - Conditions of Environmental License

The conditions contained in this Annex are to protect the environment and to mitigate the environmental impacts of the Project.

General Conditions

1. *Project in accordance with initial environmental examination documents, and future environmental licenses*
 - 1.1. The District Capital Water Supply Project must be conducted in accordance with the Final Report of Simplified Environmental Impact Statement (SEIS) prepared by Project Implementation Unit Consultant dated 20th of March 2014 and the incorporated Environmental Management Plan (EMP), except as modified or amended by this Environmental License.
 - 1.2. The Expansion, Rehabilitation and operation and maintenance of Manatuto Water Supply Systems must be conducted in accordance with Asia Development Bank Safety Environmental Principle.
 - 1.3. The Nature, Size, Location and Importance of the Project, described on page 13 – 19 (5.1-5.2) of the SEIS, strictly states the Project Site Boundary for all development and construction activities related to The District Capital Water Supply Project.
 - 1.4. To successfully implement the EMP the SEIS has given adequate instructions for the Project Implementation Unit (PIU) to monitor and report environmental compliance all through the project implementation period.
 - 1.5. As planned in the SEIS this Water Supply Project is given the Environmental License granted for two (2) years starting from the Date of the Notification mentioned in *Licensing*.
 - 1.6. Any proposed changes, alterations or additions to the Project that the Proponent wishes to undertake that are not consistent with the SEIS and EMP and this Environmental License will require an additional Environmental License or amendment of this Environmental License, in accordance with relevant provisions of *Decree Law 05/2011*.
 - 1.7. DNMA may review and alter any conditions in this Environmental License, including by requiring alterations to the Environmental Management Plan, to respond to any proposed changes to any component of the Project through any application made by the Proponent to DNMA relating to the Project, if DNMA deems it necessary to do so to protect the environment.

Additional requirements and modifications

2. Construction phase

- 2.1 When the activity starts, community near the area of the project must be included to offer them jobs in which could help minimize the social impacts;
- 2.2 For air quality related to dust, inspection should be done to ensure that residents living along the construction route are not affected. Hence spreading water will help minimize dust emission close to the residential areas;
- 2.3 The proponent must coordinate with other institution that related to this activity before implementing the project;
- 2.4 The proponent must assure that water bodies nearby are safe from siltation and contamination that includes fuel and lubricants used in the rehabilitation of the water supply project;
- 2.5 The proponent must enforce the disposal of surplus material at environmentally safe disposal/ fill sites and that spoil stockpiles are managed properly;
- 2.6 Soils from the excavation must not be disposed of near the water bodies, paddy field, Farmland and community's residential area along the road rehabilitation route;
- 2.7 Sites where rocks and sands are excavated should be 20 meters away from the river bank;
- 2.8 Avoiding excavation of soil and stone in the sensitive environmental areas (protected area/ Forest, potential landslides field, high elevation hills, etc);
- 2.9 When the project is complete, excavated areas must be rehabilitated, materials dumping, Facilities for staff and logistic installed must be demolished and managed it properly;
- 2.10 Actively monitor the water bodies that are close to the construction site during the Rehabilitation process;
- 2.11 The community from the residential areas, horticulture, paddy fields, And other types of farmlands and agricultural plantation whom are affected must be Given compensation in a fair and just manner;
- 2.12 Avoiding in necessary eviction. If any target household need to be remove, please Negotiate in fair manner and applying prior consent principle
- 2.13 During the rehabilitation activity, noise from the excavator must be controlled, need to Install appropriate warning signal for safety traffic, for the safety of worker and road Users;
- 2.14 Trucks carrying construction materials (sand, stones, cement etc) must be covered by Tarpaulin to prevent materials from falling off of the trucks;
- 2.15 Alternative roads must be built to ensure that public transportations are not delayed during the rehabilitation;

- 2.16 Rehabilitate eroded areas that caused by the construction activity;
- 2.17 During daytime construction site should be sprayed with water every three hours each day along the Rehabilitation project route;
- 2.18 Prepare disposal site for solid and liquid waste from the construction activity, excavator and trucks; except dangerous waste (oil ,lubricant and so on)
- 2.19 Worker and staff compound close by community village must be develop in coordination with local leaders and the residence. Worker and staff need to respect local people, ritual, symbols of believe and cultures;
- 2.20 Need to apply local content principle for the involvement of local people in working Opportunity and possible local material procurement;
- 2.21 Identified appropriate location for material (sand, stone, wood, water and other material) collection;
- 2.22 The Proponent must ensure that the waste is disposed of at disposal area;
- 2.23 Due to the instability of soil, high elevation of the areas and impact of climate change (more rain or less rain could cause erosion), there is need to have bio engineering expert in providing knowledge and techniques to community for re-vegetation and reforestation;
- 2.24 After the project is finally done, the company is responsible to clean up all the waste and piles from the construction activity along the project route.

National Directorate of environment will be supervision and oriented company refer to the Environment License and Environment Management Plan.

Dili, 07th of August 2014

Approved by:



Numinando Soares Martins "BURAS"
Secretary of State for Environment

Appendix 4. Transcribed Public Consultation

1. Introduction

The public consultation was led by the Administrator of Manufahi Municipality, accompanied by the National Director for Basic Sanitation, and lastly attendees coming from local authorities, representatives from the PNDS, Ministry of Public Works and ADB, with a total of 36 participants (Attendance Sheet provided in the subsequent Appendix).

The agenda was comprised of several sessions, as described below:

- a. Registry and video presentation
- b. Introduction: opening remarks from Aguas de Portugal Project Manager, National Director for Basic Sanitation and Manufahi Municipality Administrator, and at the same time officially opened the meeting
- c. Technical presentation from the Consultant team, composed of:
 - i. General Vision of the Urban Water Cycle (Presented by Gaudencia, AdP Technical Engineer)
 - ii. General Vision of the Work for the Project (Presented by Gaudencia, AdP Technical Engineer)
 - iii. Water Component (Presented by Agostinho, AdP Technical Engineer)
 - iv. Sanitation Component (Presented by Agostinho, AdP Technical Engineer)
 - v. Environmental Component (Presented by Maria Helena, OASIS National Environmental Technician)
 - vi. Social Component (Presented by Mario, AdP Project Manager)
- a. Coffee Break
- b. Discussion session (Q&A)
- c. Conclusion and Closure

Questions and recommendations during the Discussion session which were raised by the participants are accumulated and are described below.

2. Questions, Recommendation, Reclamations, Responds and Discussion (Q&A session)

2.1. Armando Silva – Local Community

[?] Recommendation: Land & Property

Concern about the drilling location at Suco Letefoho located in the community land nearby the dwellings, with no positive result from the drilling activity and considered inefficient in terms of costs. He suggested that the Project Proponent should collaborate in maximum to identify the best location, preferred to be in the Government land for the upcoming drilling activity, if required.

[?] Consultant's Clarification:

Aguas de Portugal – Mario Santos: The Water Resources team from ADP have done the survey for water Sources/ aquifer drilling and they identified several locations including the mentioned above.

The activity is part of an initial phase conducted by the Water Resources engineer/team to find out the potential water sources to be included in this project for the next phase (implementation phase) to support distribution system network

Recently water resources team still continues to look for potential sources and potential locations for drilling in order to support the upcoming water distribution network. Based on the Calculation for in 2040 water demand will be 5,327m³ /day in parallel with the increase in the number of Population.

We also have to examine the environmental and social aspects prior implementing the canalization process from the intake to the distribution tanks and to fulfill the water usage by identifying good water sources (referred to underground water) for perforation in supporting the referred system. There won't be any sustainability if the system only depends on the Merbuti spring.

2.2. Fransisco Tilman and Ms. Anita dos Reis Fernandes – Local Community from Suco Holarua

? Recommendation: Acceleration of the Project Implementation

Common recommendation to the Project Proponent in order to be carried out as soon as possible. Based on their perspective, this project will provide a long-term need but the implementation will take some time before reaching to operational phase. As older generation, they are hoping that they could also have the opportunity to enjoy the benefit of this project. As community, they are fully supporting all the trusted consultant and future contractor, and they declared that they are very eager and ready to cooperate anytime with the project proponent.

? Consultant's Clarification: Noted

2.3. Mendes – Local Community

? Questions: Guarantee of the Project

Mr. Mendes stated that this is such an important project for a developing country it will bring huge benefits to the local community. How will this Project guarantee that all local communities will access clean water both for those who already have access to and who have not since the past few years ago?

2.4. Jenico Marcal – Local Community

? Recommendation: Project Area

Concern regarding the Project area in Suco Babulu that some of the Aldeia of Suco Babulo are out of the Project zone whether or not this project will cover all of Aldeia at Suco Babulo? Because most of Suco Babulo Community live in remotes areas, far from the town, there is an existing distribution pipe of clean water with less water volume that could not support enough community's needs.

? Consultant's Clarification: Noted

2.5. João Corte Real – Holarua Suco Chief

? Recommendation: Storage tank Location (Land & property).

Stated that Suco Holarua comprises of two springs with potential sources namely; Erluli and Darelau Springs, from Aldeia Atara to Fatuku and Aldeia Urufu will establish two storage

tanks for water distribution, he recommends to identify location for storage tank as soon as possible to minimize unwanted social impact during Project implementation.

[?] Consultant's Clarification: Noted

2.6. Ricardo de Araujo – Tomonamo Aldeia Chief, Suco Letefoho

[?] Recommendation and Concern: Water Sources & Water Quantity

Concern regarding the quantity of water of Merbuti Springs that declines by time while the number of the population increases, Mr. Ricardo stated that there is an existing wallow/ small lagoon at Aldeia Aileu Suco Letefoho since Portuguese time that might be utilized as rain catchment, as he suggested to the project proponent. This aims at supporting water availability for a longer-term consumption.

He is also concerned that the community have been neglecting the Tara Bandu, sabotaging biodiversity, and eventually diminish the water availability. There's also an additional water spring used for consumption since the Portuguese time until the Japanese time, and dried in the end because the community did not follow the Tara Bandu and other traditional rules for particular sacred areas. That spring was supposed to sustain the community for a longer-term, but given the condition, the project proponent should be able to find other alternative sources, to satisfy the community's needs.

This is a long-term project that would take time. As older generation, they would like to recommend to the project proponent to find another alternative for water distribution with a short-term duration.

[?] Consultant's Clarification: Noted

2.7. Alfredo Rego – Local Community

[?] Questions: Project area

Mr. Alfredo Rego has the same concerns as Mr. Jenico Marsal (see question 2.4. regarding the project area in Suco Babulo in Aldeia Umaluli, he is requesting if possible, to include his Aldeia in this scope of the Project. In previous years, JICA has established water distribution channels in Aldeia Umaluli nevertheless there is no sufficient water volume due to lack of monitoring of water used

2.8. Amandio de Jesus – Aldeia Chief, Suco Babulo

[?] Questions: Water Drilling Location & Environmental Impact

He questioned about the Environmental Impact in regards to the 3-borehole tests for water drilling at Suco Babulo namely; Suco Searema, Lapuro, and Raimera. what is the Environmental Impact of this? How can this drilling guarantee distribute water for all of Aldeia at Suco Babulo?

2.9. Bernardino Lobato – Aldeia Chief of Lapuro, Suco Babulo

[?] Question: Project Location – Suco Babulo

He mentioned that Suco Babulo has 2 Aldeia Lapuro, which Lapuro 1 (near by the city) and Lapuro 2 far from city or nearby Suco Daisua – out of the Project Zone. Which Aldeia that would be included in the project area?

[?] Consultant's Clarification to Respond sub-section 2.2 to 2.9:

Aguas de Portugal - Mario Santos : As mentioned from the beginning of this meeting, water sources and springs are identified, local entities well collaborate all information regarding water resources are in place, the only information that needs to identify at the moment is; water quantity of water, shortly the Water Resources team will conduct a survey for each spring to calculate the volume of water in order to know how much volume that need for distribution for the project area according to the map in the red line (project zone).

The government of Timor Leste has invested in this project to cover Urban area only as of the Government also has a specific program for rural area development (PNDS) which will respond to those issue in the rural area. The project proponent has cooperated with local authority such as DGAS, Land and Property, Chief of Sucos and Aldeias, and other related entities, and the project proponent also confirming (ongoing follow up) the identified locations point of the storage tank waiting for the confirmation at the moment.

In regards to Mr. Bernardino concerns about Aldeia Lapuro 1 and 2, the technical team should conduct a more detailed study particularly to know the exact the Aldeia boundary between Lapuro 1 and 2 with the rest of the Aldeias within the supply zone, therefore it still needs to be confirmed.

2.10. Filomeno Tilman – Former Administrator of Manufahi Municipality

[?] Question & Recommendation: Monitoring, Management Plan & Legislation for Water Usage

Appreciated the presentation and the project plan that have been presented by the project proponent, one of the main concerns from the community according to our opinion in regards to the water consumption and distribution was lack of monitorization and strict law that can regulate communities to use water in manner ways. What is the Management Plan for this system in the future? How can project proponent do a monitorization for the system?

I would like to suggest, in the meantime, water meter installation should be implemented in every household, in order to control the water usage and to avoid wasting on water.

2.11. Alice de Jesus – Suco Chief of Babulo

[?] Recommendation and Concern

Ms. Alice has a common concern as Mr. Filomeno stated above regarding establishing a more stringent law.

In conclusion, the most relevant issue regards to the water consumption and distribution was the lack of control, we might establish a system with high technology even so no law is necessarily established. It will be the same, local community that live in a rural area will not be able to access for clean water even though in the urban area will be face the same issue, according to my observation 56% of local community have a fishpond nearby the house which will minimize water volume to the other household, there is no maintenance program. Other issues are the leaked pipes and public water taps that are always open carelessly by the community.

Nevertheless, she also expressed her gratitude to the ADB and the whole team for

providing this kind of program, and hoping that this project will give positive impacts to the community.

Consultant's Clarification: Noted

2.12. Francisco Tilman – Local Community

Suggestion: Commitment from the Government and the technical team

Mr. Francisco expressed his gratitude and suggested that the Government and Consultant team should be committed with less talk and implementation more on the project. The community does not want promises and does not want to attend to many meetings regarding with this project, but they want concrete results. The community is ready to support and collaborate with the project proponent, Consultant and related Contractor whenever there's an action to be done.

Consultant's Clarification to Respond Sub-section 2.10 to 2.12:

Before reaching the Operational Phase, water meter will be installed in the registered households within the water supply system during Construction phase. Every households with water meter will then have access to water and will have to pay for monthly consumption fee. With this system, the consumers will be able to control water usage.

The mechanism during operational phase, I have discussed this with the Director of DNSA (Mr. Domingos), that DNSA should provide more workers and build their capacity, especially the youths to take part in this project. Based on our experience, there should also be a team for proper maintenance with 24/7 service, to take immediate action in case the consumers have urgent problems with leakages and etc. Water meters that are being installed in the community's households will have to be the owners' responsibility himself/herself, while water meters located in the road and other public places will be DNSA's responsibility.

Related to the Chief of Suco, Ms. Alice, we will make sure relevant regulations to be established e.g. workers are in compliance with PPE usage while operating the water treatment (exposure to the chemical substances), and well-protection to the water springs in order to avoid contamination.

3. Conclusion

This project should be able to consider on supplying water not just to the community's households, but also for other activities outside the households' scope to avoid water deficits

Most of the community is expecting for this project to be implemented as soon as possible, since they are facing crucial issues on water for daily consumption and don't want to repeat uncertain schedule for water delivery into the households in the future, which means 24/7 on water service

Positive responds and inputs from the local community

Community's most concern is that certain areas (Aldeias) are not covered in the project, while some of those areas are considered remote and are in need for water

