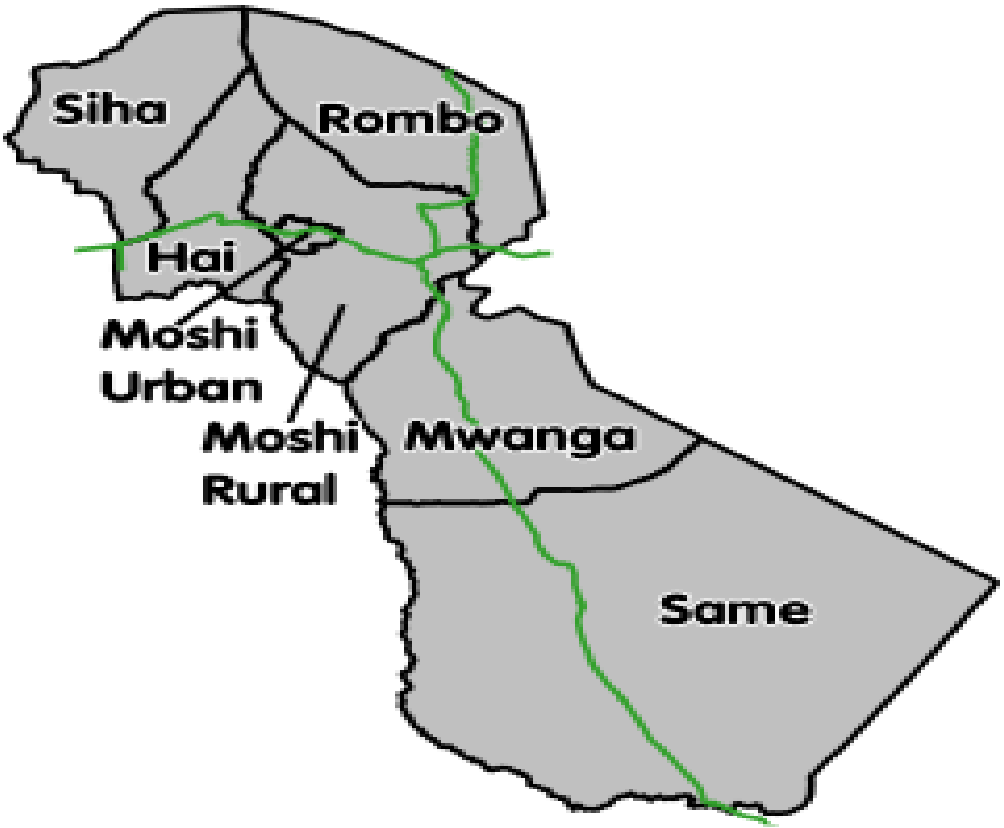
Longochi Water Supply Association (LOWASA) Rehabilitation Phase 1 Proposal

1.1.Introduction

Kilimanjaro region in found in the North East of Tanzania which is among 32 regions in Tanzania. It is located within Lat. And Long…. With many geographical features such as Mountains, Forests, Small Lakes rivers and residences. It is Bordered by Kenya Country in East and North, Arusha Region in West, Manyara region in South West and Tanga region in southern part. It is made up of 6 Districts which are **Moshi Rural, Moshi town, Mwanga, Same, Rombo, Hai and Siha.**

Map1: Kilimanjaro Region Map and its District



1.1.1. Population:

According to the National Census of the year 20012, Kilimanjaro region's Population cover was 1.64 million people which is growing rapidly. The following is the population cover for Kilimanjaro Region.

Table 1: Population distribution per Districts

Number	Kilimanjaro Region Districts	Total Population
1	Hai	210,533
2	Moshi Rural	466,737
3	Moshi Municipal	184,292
4	Mwanga	131,442
5	Rombo	260,963
6	Same	269,807
7	Siha	116,313
	Total	**1,640,087**

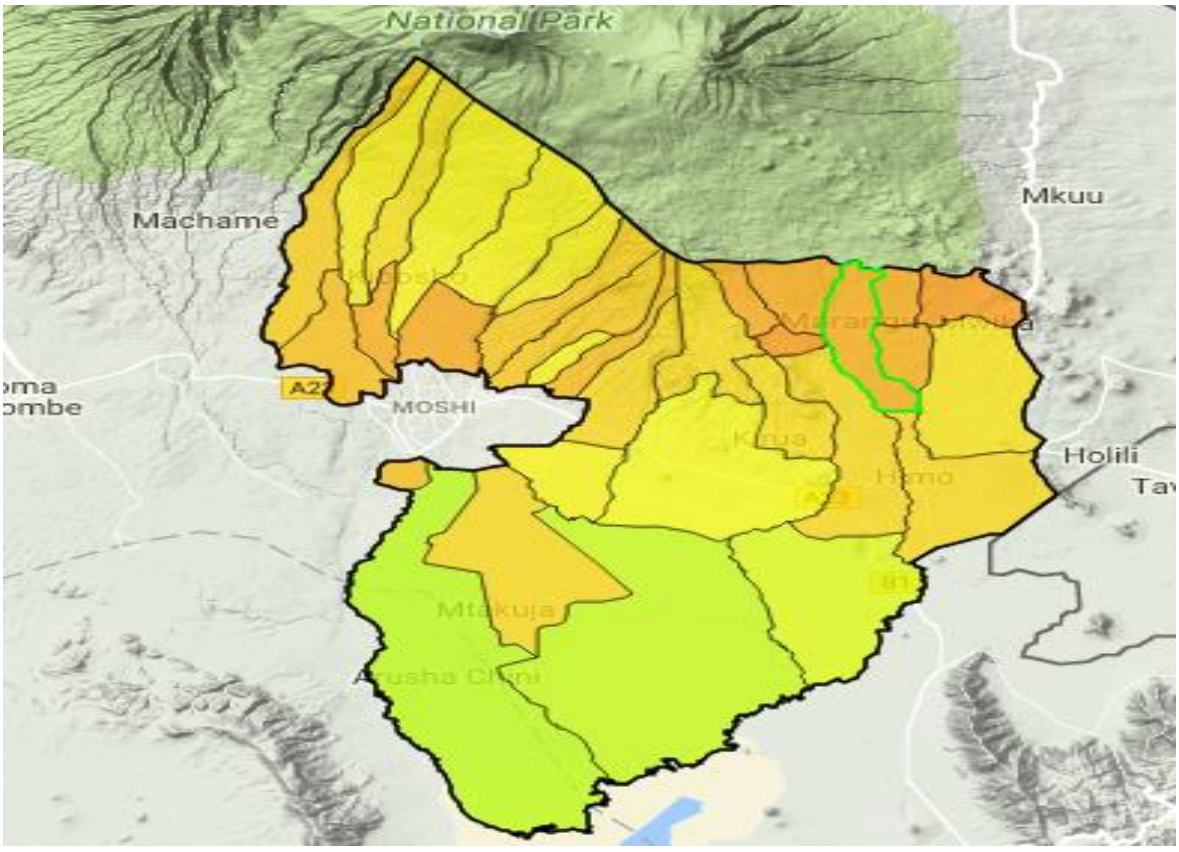
Kilimanjaro District Population cover; National Bureau of Statistics, 2012

From the above table, Moshi Rural District is leading by having high number of people.

1.2. Moshi District

Moshi District is bordered by Kilimanjaro National Park in North, Rombo North East, and Holili – Kenya in East, Mwanga and Simanjiro Districts in South, Hai District and Moshi Urban in Western

Map 2: Moshi District and its Wards



The District covers an area of 1,713 sq. km. or 171,300 Ha. of which, 124,254 Ha. is arable land 338,126 Ha. is land covered by natural forests (Kilimanjaro Forest Reserve, 37,019 Ha, Rau Ha. 570, Kahe I -

885; Kahe II 202) and 8,920 Ha. is non arable land occupied by rocks, hills and gullies. The district is characterized by mountainous topography on the northern part which forms the Kilimanjaro Mountain, while moving towards the south are the lowland.

The zone is located in the slope of Mt. Kilimanjaro and most densely populated area with the altitude ranging from 1501 – 5895 meters above the sea level. People in this zone are engaged in agriculture. The main crops are coffee, banana, fruits and dairy cattle.

1.2.1. Water Status in Moshi District:

Moshi District is leading by having many fresh water source which starts from the highland running towards the low land. Water sources found are Rivers, local canals (furrows), Streams, Springs which are more than 300 and good reserves of underground water. Moshi Rural Restrict is facing problem in Interpreted Water Resource Management which results into lose a lot of water. There has been a laxity with the Authorities and communities not taking responsibilities in securing these ample sources for the benefit of the current and coming generations. With this situation, Moshi rural District is going to lose many water sources as time goes by due to poor protection of sources.

Though there has been imposition of bylaws and regulations, there has been a problem in enforcing the regulation which ended many soured been destroyed. Many are not protected and water system are not well mobilized and established to feed majority of the population. This issues have led to runs uselessly in local streams, canals and other connected by individuals. This situation cause huge amount of water lost without control hence cause this shortage. Education is needed to whole community and ant water authorities has a duty and responsibility to effect this. Education is among is among our intention to prepare them to take responsibilities by enforcing Water Resource Management Acts (in Tanzania are Number 11 and 12 of 2009), water policies & regulations and requirement implemented.

2.0 Longochi Water Project in Marangu East Ward.

Marangu East ward is among 33 wards of Moshi Rural District with seven villages of Kitowo, Kiraracha, Kyala, Komela, Nduweni, Komalyangoe and Mbahe. The ward is made up with several water bodies which are River Whona, Una, Moonjo, multiple streams, springs and local canals. Tapped water is available to some community members connected directly to their home places while others in public areas.

Longochi water Project is among several pipped water projects implemented in Marangu East Ward which was intended to service 5 villages. Currently beneficiaries of the project are 4 villages which are adjacent to Kilimanjaro National Park forest of Mbahe, Komela, Nduweni and Komalyangoe. The Water source for this project is found within Kilimanjaro National Park Forest which is about 6 Kilometers from Community residences borders. The intake is located at 3 kilometers from the border between the National Park and community at a Latitude **3° 13’ 47.87” S** and **Longitude 37° 30’ 04.21” E**. The stream is all-weather and where its average water depth of 7 inches and the width of 15 inches where the intake is located. The project is now servicing an average of 10% of the population, but our expectations are the project to service an average of 30% of the population.

Table 2: Current Beneficiaries of Longochi Water project are:

Number	Village Name	Location		Total Population	Expected Beneficiaries
		Latitudes S	**Longitudes E**		
1	Mbahe	**3° 15' 47.86"**	**37° 30' 33.26"**	2,538	1,051
2	Nduweni	**3° 16' 50.77"**	**37° 30' 08.33"**	3,390	825
3	Komalyangoe	**3° 15' 52.25"**	**37° 29' 42.63"**	2,643	733
4	Komela	**3° 16' 13.10"**	**37° 30' 08.97"**	2,391	792
	Total Population			**10,962**	**3,401**

2.1.0 General Objectives of the Project;

To ensure reliable water availability to the community members by establishing sustainable clean water systems which will last for long period of time for the current and future generations.

2.1.1. Specific Objectives;

- To establish sustainable water supply system by facilitating major rehabilitation from the source to the intake.
- To rehabilitate all leakages by having thorough technical assessment from the intake to the distribution tank.
- To establish new connection of 2 inches' x 2200 meters long piping to support water supply to the main distribution tank hence to the community.
- To facilitate Longochi Water Supply Association (LOWASA) project registration and strong Management System which will supervise the project sustainability plan.
- Facilitate establishment of formal monthly water tariffs system, regulations and bylaws which will safeguard the project sustainability.
- Making the project independent so as to make it sustainable.

2.2.0 Expected Outcome

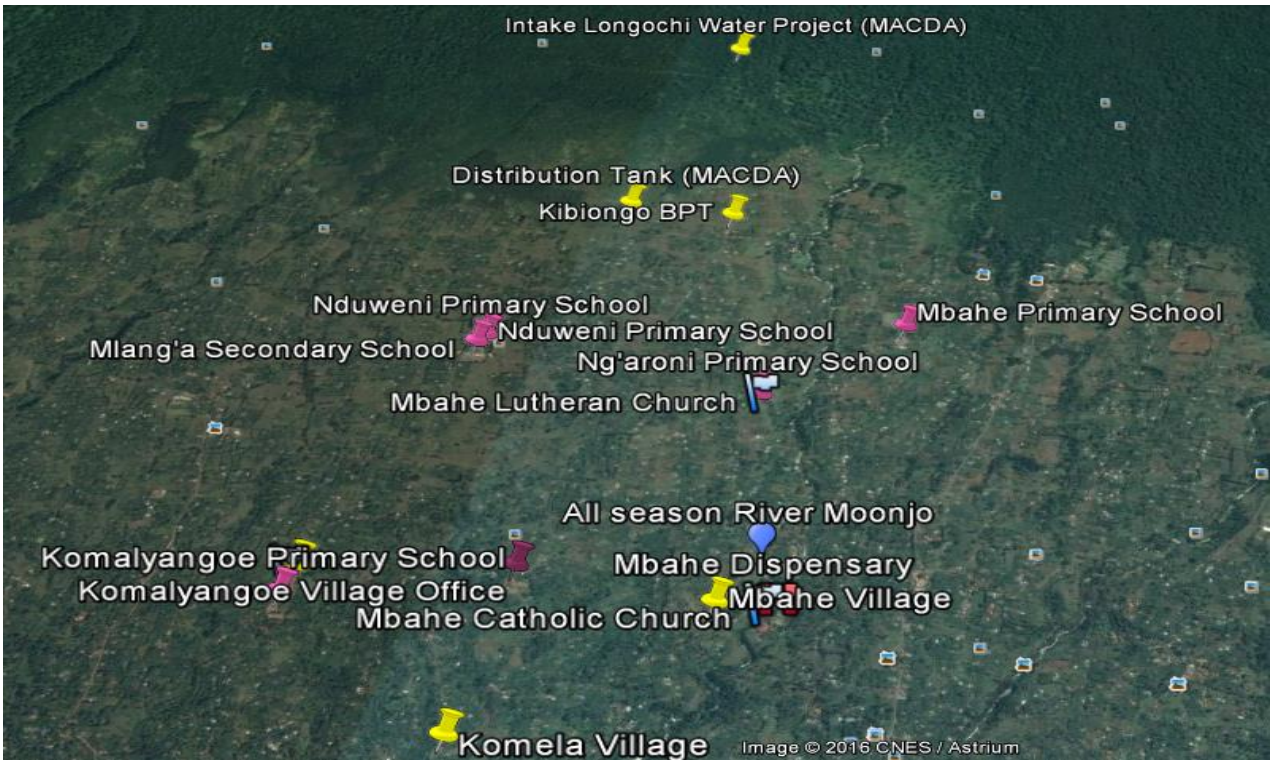
- Availability of enough water to all villages and nearby communities: After the rehabilitations, enough water will be produced and distributed
- Sustainable Water Project with sustainable clean water systems.
- Registered clean water project as Village Water User Association.
- Having Clean water while we are planning for treatment system in second phase of the project.
- Lower water turbidity from 25mg/L currently to less than 5m/L which is a National Standards Recommendations.
- All Leakages are fixed to more than 95%
- established monthly base water tariffs system with approved from project's beneficiaries, stakeholders and practitioners.

- Well established water service connectivity, regulation and guidelines where every member in need of service connection or already connected conforms.

2.4.0 Longochi Water Supply Project Status.

As pointed earlier, Longochi Water project has its source from the Slopes of Mount Kilimanjaro National Park Forest. It was implemented by Marangu Community Development Association (MACDA) from 1993-1995 when it was completed. The project was implemented to feed five villages in Marangu East ward but the intention of the implementation was not achieved since it was connected to only 3 villages of Komalyangoe, Nduweni and Komela, and later Mbahe village connected on its own efforts.

Map 3. Longochi Water Supply Project layout, beneficiary villages and Institutions



2.4.1 Challenges facing Longochi Water Supply Project:

- Uncontrolled Domestic connections.
- Current intake and system is not sufficient to support enough water needed by the beneficiary communities.
- Poor institutional framework system (not formal as no well-known water committee)
- High level turbidity due to poor structures at the source.
- Leakages which resulted into huge amount of water lost.
- Poor piping system to support the needs of the expected community.
- Population increase and demand for water use.

- Increase of residence, uncontrolled construction and need for water connectivity.
- Poor piping system from the source to the households.
- Poor hygiene and sanitation status within the community.
- Broken and decay of some old system infrastructure.

2.4.2 Longochi Water Supply Intake Condition

The intake is well constructed but with poor coagulation and sedimentation partition with small aluminum strainer (having very big holes). The sump and the dividing walls are not supporting sedimentations and also the strainer allows big particles of tree parts and tree leaves penetrated to the main supply line which sometimes results into blocking of water flow. The Supply line is 4 inches, starting with GS then PVC of 4'which goes for a distance of about 800 meters. From 800 meters, it is connected with 3 inches PVC mixed with some GS to about 2200 meters where the distribution tank is built. From the connection where the 4 inches pipe ends, 3 inches' pipe is connected. At this connection there is a major leakage where more than ½ of the water produced is lost through this major leakage.

Photo 1&2 shows condition of the Project's intake environment

Illustration. Video Clip

20161229_075504.mp4 ***If opens, this is a video clip showing major leakage, where we need to build a chamber, and connect the 2 inches pipes to the main distribution tank. Water Engineer advised to connect from this point and trouble shoot all leakages.***

Apart from this major large volume of water been lost, there are several areas with leakages from towards the distribution tank. With this reason, huge amount of water produced is lost in the way hence delays filling the distribution tank in time with capability of storing 100,000 liters. This situation leads to water scarcity and if solved water will be enough hence easier formation of strong Institutional Framework to manage the project sustainability plan.

2.5.0 Longochi Water Supply Project Phase 1 Rehabilitation Requirements

2.5.1 Source Improvement:

Beneficiary community, Stakeholders and local water technician proposed rehabilitation from the intake where several technical activities will be performed.

As per the LOWASA Project Rehabilitation improvement request, and advice from Moshi District Water Engineer (DWE) Office, the need for the source improvement will increase water production and reduce high level of turbidity.

In this scenario, the source improvement will increase water production, supply and distribution. This will reduce and sediments to meet National standards, which is less than 5mg/L. Activities which will take place here are:

- Constructing of a new aluminum strainer shield of 10 meters long with a width of 2 meters and concrete side walls for sedimentation and filtering stage 1.
- Restructuring stream walls towards the Sump by establishing concrete walls to reduce muds towards the sump
- Consolidation of sedimentations chamber number 2 to reduce medium sediments which will go together with establishing new washout chamber.
- Placement of filters in all chambers (3) as well as restructuring all washouts in each chamber.

The Intake where we need construct the aluminum strainer and placement of some water filters

2.5.2 Connection and 3 Chambers Construction

Construction of main infrastructures which need rehabilitations. The activity will take 30 days after funds are received. Hired Masson will join Community members in rehabilitation of the systems. They will happen after having meeting with the beneficiary villages for labor force as well as carrying materials from the main road to the construction sites are all in the forest in the forest.

2.5. 3 Trenching, Pipes burying and backfilling

This will be done by the community members as their contribution to the project. This will rise the sense of ownership and getting prepared for the monthly tariffs and contribute to the second phase of

the project. This will involve construction of 3 20 liters' masonry Break Pressure Tanks which will be use as water supply booster in future.

We will need casual labors mainly to support construction of the proposed areas, carrying materials for construction and backfilling of some critical points, watering/curing the structures all areas which needs extra labor force.

The task will be completed by creating second inlet to the 100,000 ($10m^3$) liters' tank. In future we are planning to install Chlorine treatment system at the inlet so as to disinfect the water.

LOWASA project 100,000 liters' masonry tank from its inlet to washout., where the propose rehabilitation phase 1 will end while waiting for phase 2 which include Building 3 break pressure tanks of 20 m^3 each

Longochi Water Supply Association (LOWASA) Project Institutional Framework:

As COWSO structure guideline in Tanzania which is stipulated by Water Resource Management Act No. 12 of 2009, we plan to facilitate legal institution which will take responsibilities of water resource management and effect our sustainability plan. The management structure will be as follows:
Executive committee with 6 members from each village (Mbahe, Komela, Komalyangoe and Nduweni) and among them we will have Administrative committee with the following leaders.

a) *Chairperson*
b) *Assistant chairperson*
c) *Secretary*
d) *Assistant Secretary*
e) *Treasurer*
f) *Assistant Treasurer*
g) *Councilor 2*
h) *WASH Coordinator 2.*
i) *One member from each Village (4)*

This Team will assist this community in having a strong managerial system where several training will be conducted to equip them with administrative skills, Financial Management and Cash Handling so as to to build sustainable water project which will transform lives of many community members by having sustainable water systems.

3.0 Budget for Phase 1 Rehabilitation

With consultation and assistance from local technical team, beneficiaries and Moshi Rural District we did an assessment and come up with this proposed budget of TSH**. 33,376,300** at

exchange rate or ***US $1: TSH 2150*** which is equivalent to **US$ 15,523.86**. The Itemized budget is attached for your perusal and consideration.

This Concept note is to draw your attention to see the need for this water project rehabilitation by increasing water production and supply to the main distribution tank which will save lives of many people who are suffering much with limited water accessibility. If successful, the project will be replicated to other parts of the region and the country at large.

Your Support to LOWASA Project will transform lives of thousands of the beneficiary community and this will be a turning point of our dreams of making this project sustainable as well as environmental conservation which we are planning to take place after water systems are in good condition.

Longochi Water Supply Association (LOWASA) Project Rehabilitation Budget Phase 1.

Narration	Unit of Measure	Units	Unit Price in TSH	Unit Price in US $	Total in TSH	Total in US $
Bricks Fabricated (400 PCS)	Pieces	400	2,500.00	1.16	1,000,000.00	465.12
Waterproof Cement (60 Sucks)	Sucks	70	20,000.00	9.30	1,400,000.00	651.16
Sand (42 tones = 6 lories of 7 tons	Tons	6	250,000.00	116.28	1,500,000.00	697.67
3/4 Aggregates (21 tones = 3 lorries of 7 tons)	Tons	3	400,000.00	186.05	1,200,000.00	558.14
Mason and plumbers (10 People for 30 days)	Human resource	30	150,000.00	69.77	4,500,000.00	2,093.02
Laborer (10 People for 3 days)	Human resource	30	100,000.00	46.51	3,000,000.00	1,395.35
GS (10 feet)	Pieces	1	85,000.00	39.53	85,000.00	39.53
ELBOW (GS 2 Pieces)	Pieces	2	15,000.00	6.98	30,000.00	13.95
Coupling (8 pieces of 2 inches)	Pieces	8	6,000.00	2.79	48,000.00	22.33
PN 16/ Class C (8 Rollers- **63 mm (2") Class D**)	Roller	7	1,260,000.00	586.05	8,820,000.00	4,102.33
NIPPLE (2 Pieces)	Pieces	2	20,000.00	9.30	40,000.00	18.60
12mm iron rode (20 Pieces)	Roller	20	20,000.00	9.30	400,000.00	186.05
Mesh wire (10 Pieces)	Pieces	10	25,000.00	11.63	250,000.00	116.28

8mm iron rode (20 pieces)	Roller	20	18,000.00	8.37	360,000.00	167.44
Binding wire (20 pieces)	Pieces	20	12,000.00	5.58	240,000.00	111.63
Working equipment (Wheel barrow, Machetes, hummers, spades, timbers, nails and seesaws)	Lumpsum	1	750,000.00	348.84	750,000.00	348.84
Transport of materials (hiring transport facility)	Lumpsum	1	3,500,000.00	1,627.91	3,500,000.00	1,627.91
Aluminum strong strainer (10 Meters)	Meters	10	20,000.00	9.30	200,000.00	93.02
Get valves (4 inches, 3 inches and 2 inches)	Pieces	3	45,000.00	20.93	135,000.00	62.79
unions 3&4 inches	Pieces	4	15,000.00	6.98	60,000.00	27.91
Connectors	Pieces	10	15,000.00	6.98	150,000.00	69.77
Strainers 4 meters	Pieces	2	8,500.00	3.95	17,000.00	7.91
Pipe flange	Pieces	1	85,000.00	39.53	85,000.00	39.53
Adaptor flange 4 inches	Pieces	2	55,000.00	25.58	110,000.00	51.16
Reducing Socket	Pieces	1	25,000.00	11.63	25,000.00	11.63
Collar Complete	Pieces	1	150,000.00	69.77	150,000.00	69.77
Direct collar	Pieces	2	115,000.00	53.49	230,000.00	106.98
VAT 18% (Transaction Costs)	percentage	0.18	28,285,000.00	13,155.81	5,091,300.00	2,368.05
Total					**33,376,300.00**	**15,523.86**