Laga Guracho Water Development project in Jima Arjo District, East Wollega Zone, Oromia, Ethiopia

Submitted to;

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1. Introduction

The provision of safe, clean and suitable water is a major challenge for both rural and urban areas in developing countries with the rapid growth of their populations. As it is well known water is life and getting water supply for drinking and other activities is more challenging in rural villages. Appropriate rural water development is a key to alleviating water scarcity and the degradation of water quality. The Lack of access to safe and adequate water supply is a cause of health problems that associated mainly with waterborne diseases. Ethiopian is the third populous country in Africa and the majority of the population resides in rural parts of the country. The living situation in rural areas are challenging where little attention is given in providing infrastructures to rural villages and even provision of clean water is so challenging in rural villages of Ethiopia. The major source of drinking water supply of our rural society is rivers, streams, unprotected springs, ponds and open wells. These sources are shared by animals (domestic and wild) and humans alike, with the resulting health risk. Since majority of rural drinking water supplies are unprotected, it will be polluted with different antpogenic agents and endanger health of the community and affects economy and every developmental activity. Thus, hundreds of people fall sick and die as a result of drinking water contamination. Children in rural areas are more subjected to be affected by waterborne diseases and cannot attend their schools regularly and in some cases the problem is serous and makes the student to drop from school.

The burdens of rural house hold activities mostly lie on the shoulders of children and women; as a result the serious problems of villagers living surrounding Guracho spring water supply is that the women and children travel long distances to bring water to home for domestic consumption every day. For this reason women waste much of their time travelling long distance that

influence the productivity in the well beings of family in general and also highly affect the school and study time of children.

To this end gravity aided spring water development of Guracho spring was proposed to supply water for domestic uses and other activities for the inhabitants residing in the downstream living population. In addition the Guracho spring constructed before 20 years is already damaged and infiltrating floods to the collection chamber box that pollutes the water causing many complicated health problems to the society. Therefore, the development of Guracho spring water will be the keys way out to avail clean and safe fresh water to the local rural communities by adopting the gravity aided spring development techniques.

2. The Project Description

The discharge of Laga Guracho spring was measured to be one liter per second during the driest season of the year. Laga Guracho spring water was developed initially in 2007 as a spring on spot development and was serving the population of the surrounding area from the single distribution point at the source. Currently the collection chamber is highly damaged and infiltrates floods during rain seasons and dust particles during dry season polluting the water. The only distribution point at the source of the spring cannot give the maximum supply of water to the community since some communities were settled at a very far location and travel more than 1.5km to collect water from the distribution point located at the source of spring. Those communities who can't travel such long distances due aging and other health problems are forced to use the unprotected downstream flow rivers. Thus, we propose another (second) distribution point with four faucets at about 1km from the first distribution point (source) in downstream communities to be constructed to reduce the long travel the community an average distance of 500m. Thus, the Laga Guracho project requires two distribution points to be

constructed; one at a source of the spring and the second distribution point with four faucets at 1km from the source to the downstream villagers through pipe line installation.

3. Location of the project

The Laga Guracho Spring water is located in Jima Arjo District of East Wollega zone at about 48 km from Nekemte town in south west direction.

Figure 1: Location of the spring water from Google Earth

I. Laga Chali Spring Sources

a) A woman collecting water from the source of Laga Guracho

b) Damaged construction& flooding and any precepitaion runs into the collection chamber

Figure 2. Field Visit of Laga Guracho Spring water

4. Objective

The main objective of this project is to improve access to safe and clean drinking water supply of rural villages by developing gravity aided springs development. It improves the health of the communities and save the women and children time and foster educational activities, social participation and development activities.

5. Populations of Project Area

The population of the community that will be benefited from the projects is summarized in the following table.

Spring water users	**Population**	**Remark**
At First distribution point	600	
At second distribution point	1350	
Total Population to be benefited from the project	**1950**	

6. Community Participation

In the Rural spring development project, consultation with community is the begging activity to create community ownership on the project. Community participation in activities requires community contributions in labor to develop a sense of community ownership in the project. The community will be partcipated with every aspect of the project such as contribute labor towards the project, and will donate land required to build the distribution points and pipe line installation.

7. Collaborators

The zonal and District Administration offices are key collaborators in linking with lower level local administration to run the project effectively. The District Water Resource offices are the partners for the community in maintaining sustainable water supply in rural areas. The Nekemte Rotary club is the key partner in supervison of the work and hosting the budget to be funded

8. Estimated Cost for Laga Guracho Spring Development

i. Construction Materials Cost and specification

NO	Description of required material	Unit	Quantity	Unit cost (ETB)	Total cost (ETB)	Remark
1	Cement	Quintal	35	1750	61250	
2	Gravel for Concrete works	m^3	4	3500	14000	
3	Rocks for masonry work	m^3	24	1450	34800	
4	Sand	m^3	16	1500	26400	
5	Gs Φ10	DN20	8	1500	12000	
6	Soft wire/Black wire	kg	1	200	200	
7	HDP pipe $1\frac{1}{2}$ inch	*m*	500	175	87500	
8	HDP pipe 1 inch	*m*	500	145	72500	
9	$\frac{1}{2}$ inch GI Pipe line (single 6m long)	number	2	1500	3000	
10	$1\frac{1}{2}$ inch GI Pipe line (single 6m long)	number	2	5000	10000	
11	Faucets $\frac{1}{2}$ inch	number	4	300	1200	
12	Unions HDP $1\frac{1}{2}$ inch	number	6	600	3600	
	Unions HDP 1 inch	number	4	500	2000	
13	$\frac{1}{2}$ inch T Galvanized steel	number	3	50	3500	
14	$\frac{1}{2}$ inch Union Galvanized steel	number	6	50	300	
15	Female Adapter 50mm to 1 inch	number	2	500	1000	
16	Reducer $1\frac{1}{2}$ inch to $\frac{1}{2}$ inch	number	2	350	700	
17	Reducer 1 inch to 1 inch	number	2	300	600	
18	Female Adapter 1inch	number	2	300	600	
19	Elbow Galvanized steel	*number*	3	50	150	
20	Transportation cost of construction materials to the site				22500	
Sub Total 1					**357800**	$6,277

ii. Masonry, Concrete and Pipe line installing Work Cost

NO	Description of Activities	Unit	Type/ Quantity	Unit cost (ETB)	Total cost (ETB)	Remark
2.1	Concrete work for Water collection box and Masonry work around spring source				55000	
2.2	Water Distribution stand point at source				12500	
	Second water Distribution stand point				15750	
2.3	Concrete work				12275	
2.4	Two Washing clothes stand				11500	
2.4	Pipe line installation				30000	
Sub Total 2					**137,025**	$2,404

iii. Personnel cost

NO	Description of required material	Unit	Type/ Quantity	Unit cost (ETB)	Total cost (ETB)	Remark
3.1	Supervision of the work	80 day	2	402	64320	
3.2	Two Technical Experts	60 day	2	402	48240	
3.3	Resources Purchase personnel	12 days	2	724	8688	
Sub Total 3					**121,248**	$2,127

iv. Total Grand Cost of the project

No.	**Description of Activities**	**Total cost** (ETB)	**Total cost** (USD)	**Remark**
1	Construction Materials cost	**357800**	6,277	
2	Masonry and Concrete work	**137025**	2,404	
3	Personnel cost (Periderm)	**121248**	2,127	
Total Grand		**616,073**	**10,808**	

Key: ETB- Ethiopian Birr (Currently, the currency exchange rate, 1USD=57.00 ETB)