
**SUSTAINABILITY OF RURAL WATER SERVICES
IMPLEMENTED USING COMMUNITY-MANAGED
PROJECT APPROACH IN AMHARA REGION OF
ETHIOPIA**



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ABSTRACT

Sustainability of rural water supply of Africa does not work as it was intended. Between 20% and 70% of installed hand pumps in Africa are not functioning. In Ethiopia 35% of the hand pumps are in the same situation.

The purpose of this thesis was to study the sustainability of rural water services using Community Managed Project (CMP) approach of Amhara National Region State (ANRS) of Ethiopia. In addition, the aim was to find factors which affect the sustainability and find solutions to factors threatening sustainability.

This was conducted in five woredas (districts) in South Gondar region of Amhara National Regional State (ANRS). It became important to Community-led accelerated WaSH (COWASH) of Ethiopia to check the sustainability of water services implemented in rural areas of Amhara region of Ethiopia using the Community Managed project Approach (CMP). It was also important to underline major issues influencing the sustainability of this area.

For their being necessary to this study both secondary and primary data collection were utilized. In order to find necessary primary data, different set of questionnaires were prepared for different stakeholders and local beneficiaries. Officials from local water offices and regional level offices were also interviewed to get the secondary data collection.

Reliable results came out in terms of functionality rate of schemes, sense of ownership and high community participation in all levels of scheme management from planning to financial management. An average functionality rate of 98% was observed during this study. However, the major and common threat in all schemes whether they are CMPs or non-CMPs was the shortage of water in a dry season period.

Keywords Water, Rural water supply, Sustainability, Ethiopia.

Pages 46 p. + appendices I p.

Abbreviations

ANRS	Amhara National Regional State
CMP	Community Managed Project
WASH	Water, Sanitation & Hygiene
COWASH	Community-led accelerated WaSH
MOWE	Ministry of Water & Energy
MVTT	Maa ja vesi-tekniikka tuki ry
TUT	Tampere University of Technology
ReCMP	Research on CMP
CSA	Central Statistical Agency
WSSCC	Water Supply and Sanitation Collaborative Council
UAP	Universal Access Plan
JMP	Joint Management Program
AMCOW	African Ministerial Conference on Water
CSO	Country Status Overview
CDF	Community Development Fund
RWSEP	Rural Water Supply & Environmental Program
EFY	Ethiopian Fiscal Year
WASHCO	Water, Sanitation & Hygiene Committee
UNICEF	United Nation Children's Fund
WUC	Water User's Committee
WWG	Woreda Water Group
WWT	Woreda Water Team
O & M	Operation and Maintenance
RWSN	Rural Water Supply Network
GOE	Government of Ethiopia
GOF	Government of Finland
HDW	Hand Dug Well
SPD	Spring Development
ACSI	Amhara Credential and Saving Institutions
1Euro	24.00 ETB (Ethiopian Birr)
1USD	18.24 ETB (Ethiopian Birr) (Exchange rate on 18.12.2012)

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1 Introduction

This Bachelor's thesis is a part of a research called ReCMP (Research on Community-Managed Project) which is implemented by Tampere University of Technology. ReCMP project investigates the effectiveness of Community Managed Project (CMP) approach in the rural water supply development in Ethiopia. In addition to this thesis, ReCMP will produce three Master's of Science theses and one Doctoral dissertation. As the purpose of this thesis is to deal with the sustainability part of the ReCMP, ReCMP project is implemented by Tampere University of Technology (TUT) in Finland in close co-operation with Community-Led Accelerated WaSH (COWASH) development in Ethiopia. The ReCMP project is financed by the Finnish association called Maa- ja vesitekniikan tuki ry (MVT).

This study concentrates on five districts (woredas) in Amhara region of Ethiopia, which were chosen randomly and was started at the beginning of 2012 and will last till March 2013.

This thesis is supposed to find techniques, mechanisms and strategies to improve the sustainability of CMP water points and also to identify the existing problems which are threatening the sustainability of CMP water schemes.

1.1 Background

Ethiopia is located in the Horn of Africa. Based on the national census of the year 2007, Ethiopia had a population of 73,918,505 with an estimated growth rate of 3.2%, for a current population estimation of 86 million, of which 17 % live in urban areas. Ethiopia covers an area of 1.14 million square kilometers.

As seen on the map below in Figure 1 Ethiopia has borders with Sudan and South Sudan to the west; Eritrea to the north and north-east; Djibouti to the east; Somalia to the east and south-east and Kenya to the South. Ethiopia has nine regional states under its federal administration system. Amhara National Regional State (ANRS) is one of these regional states. ANRS is located in the west of the country and shares borders with Tigray to the North; Afar to the East; Oromia to the south; Benishangul/Gumuz to the southwest and the Republic of Sudan to the west. ANRS had a total population of 20 million, making it the second mostly populated region in Ethiopia, (CSA Ethiopia, 2012).

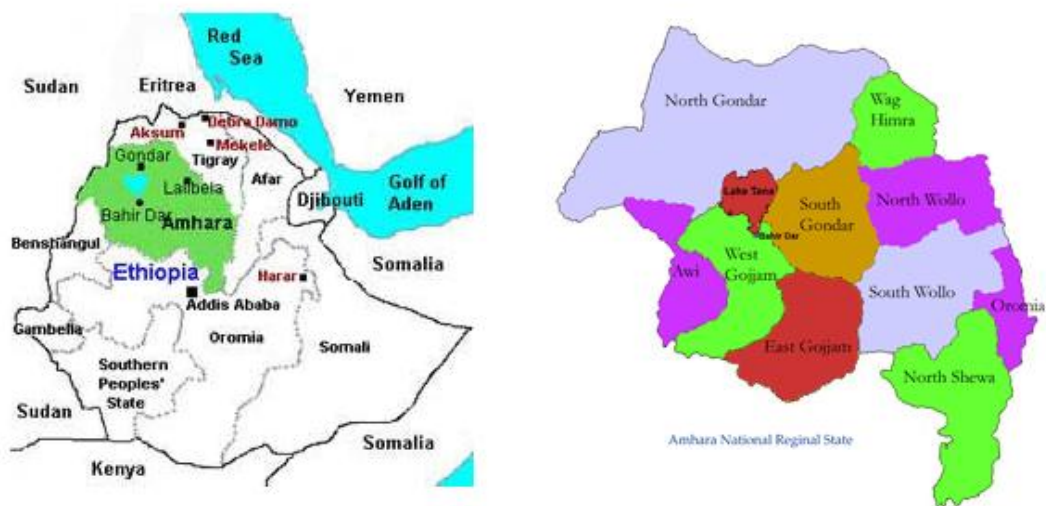


Figure 1 Map of Amhara National Regional State (ANRS)

Water is one of the basic needs of human beings. Still, achieving sustainable water supply remains one of the milestones of Third World countries. About 900 million people get water from unimproved sources, which is a threat to their health and productivity. The majority of these people are from rural areas. In Africa, the best way to get clean water is by using boreholes, but there is a big question mark on their functionality as the non-functionality rate of these boreholes is very high.

The system sustainability may be affected by inappropriate technology like poor construction, unavailability or high cost spare-parts, missing professional support services, drying-up of the source or the theft. In addition, there are some other factors affecting the sustainability, like social and institutional ones such as community participation and sense of ownership (WSSCC, 2012)

Ethiopia is a poor, populous and vastly growing country and still appropriate measures have not been taken to improve the community's access to improved drinking water. Despite Ethiopia's goal of achieving a full coverage of Water, Sanitation and Hygiene (WASH) through its Universal Action Plan (UAP), there is a long way ahead to get a fully functional and sustainable water service system. In 2008, only 26% of the total rural population had access to improved drinking water sources as shown in figures of Joint Management Programme (JMP) in Figure 2 below (AMCOW CSO2, 2009/10).

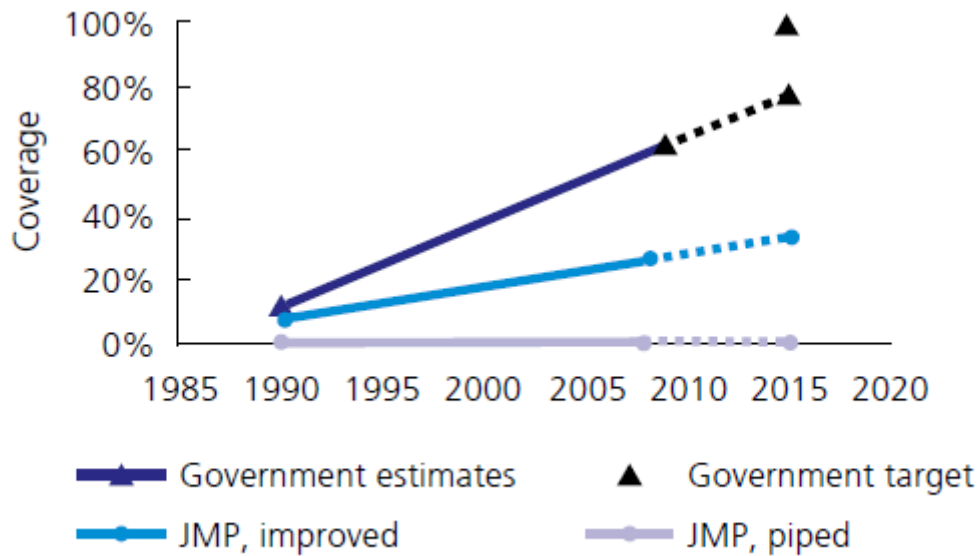


Figure 2 Estimations of Government of Ethiopia & JMP in rural water supply coverage

According to the Central Statistical Agency (CSA) of Ethiopia, Ethiopia's rural access to clean water supply was 53% between the years of 2007 and 2008. It is understood that slightly less than half of the residents in the countryside use unclean water for drinking or other purposes. Therefore, this could be a big threat to the health of locals and the sanitation of the system in general.

Ethiopia's Amhara region has had WaSH project for almost the past two decades. This project is financed jointly by governments of Ethiopia and Finland. Before the implementation of the project a study was conducted to evaluate, plan and design the project.

After the implementation phase, water supply coverage has risen tremendously and studies showed assuring results, according to some controversial statistics from the Ethiopian government of 19% to 66%, between the early 1990s to late 2000s. Though figures of Joint Management Program (JMP) vary between 8-26%, the Ethiopian government insists its claim of water coverage growth of up to 66%. Referring to Figure 2 above it is agreed that good results have been achieved so far. Both results highlights considerable step forward to beneficiaries and donors of the project. This also enabled further investments in the project (AMCOW CSO2, 2009/10).

In 1994, the Rural Water Supply and Environmental Program (RWSEP) started to carry out WaSH rural water supply activities in the Amhara region. It was financed by the governments of Finland and Ethiopia. CMP was introduced in 2003 under the former name of Community Development Fund (CDF) to manage WaSH projects by participating local communities or beneficiaries in the project. Early results of this approach showed positive results, because the majority of the activities and management of the schemes were transferred down to the beneficiaries. By 2005, CMP modality was operational in all RWSEP (Rural Water Supply and Environmental Programme) woredas. These woredas were renamed as RWSEP-CDF and now RWSEP-CMP, since they were functioning in CDF modality. After many fruitful results, including high functionality rate and high community ownership feeling, CMP attracted the eyes of the Ethiopian government to make use of this approach for its national WaSH strategy to achieve its Universal Access Plan.

It became important to do research on CMP to scientifically check that CMP is the best solution for achieving a full sustainability and coverage of the rural water supply. This thesis especially deals with the sustainability of CMP water schemes. This thesis also examines whether the sustainability of these CMP water points is over 90%, one of the key objectives.

As mentioned earlier, RWSEP was established in September 1994 and supported technically and financially by governments of Ethiopia and Finland in the two zones of East Gojjam and South Gondar in Amhara regional state. RWSEP went through four consecutive phases. The first phase ran between September 1994 and June 1998. The operational target of the first phase was reached by 100% making phase 1 successful and productive (RWSEP, 1999).

Phase II continued between July 1998 and December 2002. The overall program objective was the achievement of sustainable human and physical development for communities to take responsibility for their own development; This means increasing sanitation and hygiene of communities as well as improving the infrastructure and self-sufficiency. Other program purposes included increasing gender equity, afforestation and enhancing the health of livestock.

The involvement of RWSEP increased up to 18 woredas in the four zones of South Gondar, East Gojjam, West Gojjam and Awi zone. By the end of Phase II, the kebele level rural water supply coverage increased from 23 to 75%. A total of 1434 of community and institutional water points were constructed during this phase, out of which 96% were functional by the end of Phase II (RWSEP, 2002).

RWSEP phase III continued between January 2003 and June 2007 (1995-1999 EFY). In this phase, RWSEP continued the decentralized trend down to the community level. The overall objective of the phase was that the communities would implement their own plans for sustainable development and to have the ability and capacity to define and manage this development. The main purposes included strengthening community's capacity of initiation, planning, implementation and management of the water supply and sanitation, environment and related water schemes and processes. The significant change in this phase was the establishment and adoption of CMP approach under the CDF in early 1995 EFY (Ethiopian Fiscal Year) to facilitate and encourage efficient financial management and the development of financial mechanisms that allowed the communities take responsibility for re-investment in the schemes thus ensuring sustainability. Furthermore CDF encourages using the optimal utilization of available financial and human resources.

CDF first started in two RWSEP woredas at the beginning of 1996 EFY from zones of West Gojjam and Awi. By 1998, the CDF approach spread to five more woredas from zones of South Gondar, West Gojjam, South Gojjam and Awi and finally took over the two remaining program woredas of East and West Gojjam zones.

At the end of this phase, a total number of 1848 water points out of which 1275 were working in CMP (formerly CDF) modality was implemented. Good results were achieved towards the targets of the phase: there was a significant increase of water supply access and was better and faster than the previous phases. Sustainability of water

points also increased and sanitation and gender equality improved significantly (RWSEP, 2007).

By 2005 all RWSEP water points were functional under CMP and took the name of RWSEP-CMP. This CMP modality differs from other approaches as it mobilizes the beneficiaries to participate in all the scheme activities. Beneficiaries and Water, Sanitation and Hygiene Committee (WaSHCOs) are in charge of starting from the early stages of planning up to the overall management of the scheme including financial management, implementation and maintenance. In addition to that a minimum of 15% of community contribution either in cash or kind is required for the scheme implementation. Therefore CMP has a higher community participation and mobilization than other approaches, (COWASH, 2011)

Finally, RWSEP phase IV started in 2007 and continued up to December 2011. The main objective of this phase was achieving Universal Access Plan (UAP) goals by using CDF (now CMP)) and scaling-up the CDF approach replication and institutionalizing the best practices, (RWSEP, 2011).

In May 2011, community-led WaSH (COWASH) was established in order to assist the Government of Ethiopia (GE) in scaling up CMP approach implementations and to help the government of establishing one national WaSH country-wide. After RWSEP was phased out in September 2011, COWASH worked as a substitute of RWSEP and commenced its task in Amhara region in the second quarter of 2004 EFY in order to scale-up CMP implementation modality in Amhara region. By 2011 the CMP approach implementation spread through new regions of Oromia, Tigray and Southern Nations, Nationalities and People's Region (SNNPR), (COWASH, 2012). Table 1 below shows the phases of RWSEP from the beginning till the end.

Table1 A brief summary of RWSEP Phases

Phase I 1994 - 1998	(Ethiopian Fiscal Years 1985-88)
Phase II 1998 - 2002	(Ethiopian Fiscal Years 1989-92)
Phase III 2003 - 2007	(Ethiopian Fiscal Years 1993-99)
Phase IV 2007 – 2011	(Ethiopian Fiscal Years 2000-03)

Starting from phase 1 under the name of RWSEP up to phase 4 of CMP, the success and productivity of each phase has been going on expeditiously. For example as shown in Table 2 below, the sanitation and hygiene coverage of the population in those areas vastly improved, especially between the third and fourth phases, from 35.9% to 93%. It might be possible to take local people to fetch unsanitary water from remote areas, but after implementing water schemes it is possible to save time used to spend on getting water as well as save lives, which were infected due to low water sanitation and sanitation.

Table 2 RWSEP's invested fund, constructed number of water points, amount of beneficiaries and sanitation level between phases 1 and 4 (RWSEP 2011)

Phase	Costs (M Euros)	WPs	Beneficiaries (water)	Sanitation and hygiene
I	5,51	534	126,592	Access for 6.5 % of population
II	5,99	902	213,882	Access for 17.1 % of population
III	7,97	1,848	438,198	Access for 35.9 % of population
IV	11,12 (end of June 2011)	3,240	768,268	Access for 93 % of population
Total	30.58	6,524	1,546,940	

1.2 Statement of the problem

According to UNICEF Zambia and the Rural Water Supply Network (RWSN), in Sub-Saharan Africa between 20% and 70% of installed hand pumps are not functioning, and in Ethiopia about 35% of its rural installed hand pumps are not functioning. This is due to the low sustainability of the water point. Sustainability is the backbone of CMP approach.

1.3 Objectives and research questions

The study has the following main objectives and specific objectives

The main objectives include first to examine the sustainability of rural water services using the CMP approach, second to observe factors and issues affecting and undermining sustainability. The final main objective is to find solutions to those factors threatening sustainability.

The specific objectives are to ensure whether sustainability of CMP approach is above 90 % as stated in the previous RWESP reports, and to find strategies to improve sustainability of water schemes.

Research Questions of this study are included the following questions

1. Is sustainability of CMP in the water service system really above 90%? If yes, what is the reason? If not, what went wrong in the previous findings?
2. How does the CMP approach affect the sustainability of water services in rural areas? What kind of effects does sustainability have on beneficiaries?
3. What are the mechanisms and strategies needed to improve the sustainability of rural water schemes implemented using the CMP approach?

2 Methodology

Five districts (woredas) were chosen intentionally from the two zones of South Gondar and Awi after a long discussion with COWASH Amhara region zone advisor Mr. Abraham Kebede. The five woredas selected were Fogera, Farta, East Estie and Libo kemkem from South Gondar zone, where as Guangua Woreda was selected from Awi zone. Those woredas were chosen on the basis of their being CMP and non-CMP woredas.

As they are relevant methods in this study qualitative, quantitative, data collection and data analysis methodologies were utilized. A set of questionnaires was prepared for the different respondents. Then the data obtained was categorized and analyzed.

As stated in Table 3 below a total of 33 water schemes containing 16 CMP (4 non-functional) and 17 non-CMP (4 non-functional) were chosen randomly and 98 respondents were selected from roughly 1650 households comprising all community parts including beneficiaries, Water Users Committee (WUC) or WaSHCO, local contractors (artisans), local spare part suppliers, Woreda WaSH Team (WWT) and Woreda Water Office (WWO) were interviewed. One could argue that all the non-CMP not functioning water points are relatively older than those in CMP and that is why CMP water points have a higher functionality than their non-CMP older counterparts.

That could be good reasoning but if the period of failure is observed it is understandable that the average period of failure of CMP schemes in this case is only about six months, whereas the average of non-CMPs is about eight years. In this case, it is highly understandable that those non-CMP water points are abandoned ones whereas CMP failed schemes have still good and logic opportunity to be maintained.

Table 3 Summary of the failed water points.

<i>District (woreda)</i>	<i>Age of the water scheme in (years)</i>	<i>Reason for failure</i>	<i>Implemented by</i>	<i>Modality</i>	<i>Period of failure</i>
<i>Fogera</i>	-	<i>Water Shortage</i>	<i>GOF</i>	<i>CMP</i>	<i>~1 year</i>
<i>Guangua</i>	6	<i>Technical fault</i>	<i>GOF</i>	<i>CMP</i>	<i>1 week</i>
<i>Guangua</i>	5	<i>Technical fault</i>	<i>GOF</i>	<i>CMP</i>	<i>2 months</i>
<i>Farta</i>	4	<i>Technical fault</i>	<i>GOF</i>	<i>CMP</i>	<i>1 year</i>
<i>East Estie</i>	15	<i>Technical fault + negligence</i>	<i>Government of Ethiopia</i>	<i>Non-CMP</i>	<i>5 years</i>
<i>East Estie</i>	16	<i>Technical fault + shortage of water</i>	<i>RWSEP</i>	<i>Non-CMP</i>	<i>14 years</i>
<i>East Estie</i>	20	<i>Water shortage</i>	<i>RWSEP</i>	<i>Non-CMP</i>	<i>13-14 years</i>
<i>Libokemkem</i>	5	<i>Theft of instrument</i>	<i>World bank</i>	<i>Non-Cmp</i>	<i>1 year</i>

Roughly 58% of the total respondents were male; the remaining 42% were female. Fifty-nine percent of the respondents were between 21-40 years and 57% have 6-10 persons in each household.

2.1 Data Collection

In this research primarily two methods of data collection were used. Firstly, primary data collection method. This is collecting data needed through a prepared set of questionnaires, interviews with focus groups and personal observations. Secondly, secondary data collection. This method is collecting all other data which could not be found through interviews, such as old data and inventory data of the area.

2.2 Data Analysis

Data analysis means the process of data cleaning; refining and transformation were used to analyze the collected data and graphs and charts were used to present the information visually.

3 Literature Review

In this literature review part several issues will be discussed including short definitions about the concept of “sustainability”, sustainability of former WaSH projects in different parts of the world and ways of improving sustainability in Sub-Saharan Africa.

3.1 Sustainability as a concept

Below are various definitions of the concept of sustainability.

As a definition sustainability might mean

The concept of sustainability can be defined in various ways.

As to its general meaning the word sustainability is derived from the Latin word of *sustinere*, which means to hold-up (*tenere*, to hold and *sus*, up). "For humans in social systems or ecosystems, sustainability is the long-term maintenance of responsibility, which has environmental, economic, and social dimensions, and encompasses the concept of stewardship, the responsible management of resource use, (Wikipedia)

As Environmental Science definition it means, the quality of not being harmful to the environment or depleting natural resources, and thereby supporting long-term ecological balance, (www.dictionary.com)

As a water service definition this would mean that water continues to be available for the period for which it was designed in the same quantity and at the same quality as it was designed, (Abrams, L. 1998)

As defined by the Brundtland Commission of the United Nations, sustainability is fulfilling the needs of the current generation and preparing the future generation all the possibilities to achieve their own needs. However, many people argue that this is not right enough to take as a definition Brundtland Commission, (1987,definition)

As can be seen below in Figure 3, sustainability was classified into three major areas as shown in the three spheres diagram shown below and was first adapted by University of Michigan, but was discussed in the report of Vanderbilt University. Environmental, social and economic factors are the main three players in the sustainability. Therefore harming one of them does not mean harming that factor alone but jeopardizing the sustainability too, (Vanderbilt University, 2012).

The Three Spheres of Sustainability

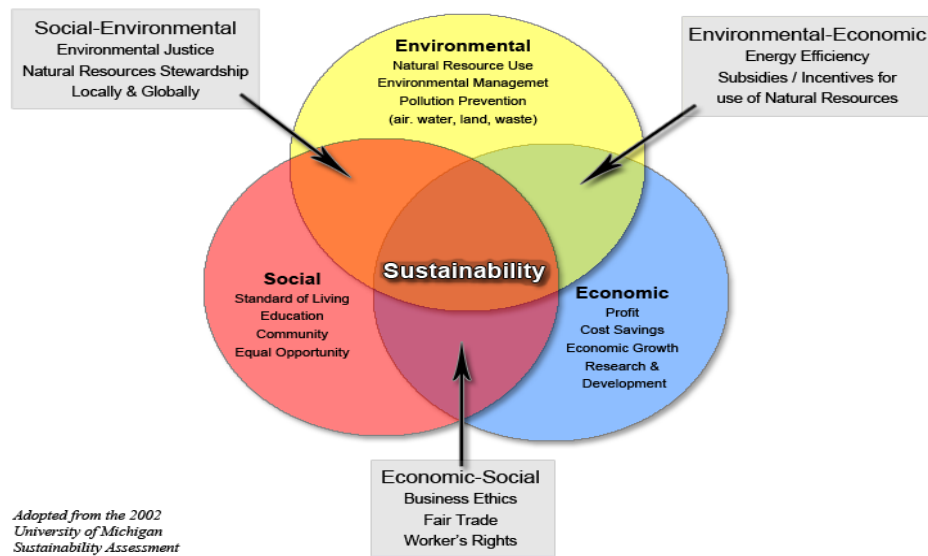


Figure 3 Components and major players of sustainability

Apart from those different definitions, there are driving mechanisms of sustainability of a project. Figure 4 briefly explains the concept of sustainability

Motivation; This means the motivation of beneficiaries in taking part in pre and post construction of the project.

Maintenance; This means having all capabilities and techniques to maintain the system constructed and preparing all necessary maintenance materials.

Cost Recovery; This means contribution of user groups for future new scheme construction if a major break down or failure happens.

Continuing Support: This means beneficiaries' full support everlastingly, (Carter et al 1999).

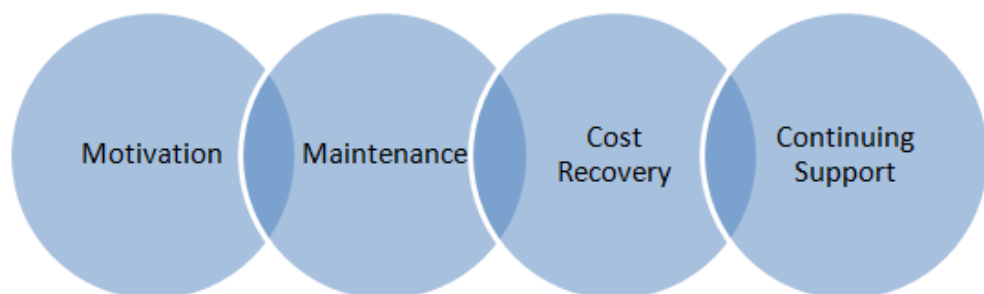


Figure 4 The sustainability chain

3.2 Sustainability in former WaSH projects

From the beginning of the WaSH campaign, sustainability was very crucial in every project concerning the policy of water, sanitation and hygiene (WaSH). Sustainability in WaSH varies from project to project and area to area. Some examples of sustainability in some former WaSH projects are discussed below.

In Indonesia it was found that the following factors undermined sustainability of Care International constructed hand pumps in that area.

There are diminished community valuation of the clean water of hand pumps, because of their dependence on alternative water sources like streams and dug wells.

Ready availability of spare parts is also another problem, though hand pumps were locally manufactured.

The informal system of management by isolated user group that was not equal to the logistical and financial complexities of maintenance and repair. (WaSH no. 94, 1994)

There are certain factors that undermine sustainability of some rural water service in Ethiopia.

According to Awoke's study (Awoke 2012) conducted in Quarit Woreda in Amhara region, the following issues undermined the sustainability of rural water supply in that area.

First, low community participation and involvement in the design phase of the project like selection of site and technology. Therefore, ownership feeling of the community suffered a lot. Second, poor construction quality, meaning there was a shortage of skilled man power in the area and missing of the administrative role in monitoring under construction schemes. Third, no demand-driven or demand-responsiveness and this caused community dissatisfaction and later resulted in low ownership feeling.

In Uganda, sustainability of rural areas is undermined by technical issues (spare parts supply, mechanics) and social ones (users' role). (Mommen & Nekesa 2010)

3.3 Ways of improving sustainability in Sub-Sahara Africa

Sustainability can be improved by adapting an integrated approach of planning, design and construction in the scheme implementation phase, plus Operation and Maintenance (O&M) with inputs from constructors and their suppliers.

Water schemes must be regarded as they were common assets and should be taken care of in a way that they can exist as long as they were designed to operate and function. As Baumann suggested in his article (2006). Two ways of collecting O&M to keep the water point sustainable.

'Model 1: Community management, in this model the local community covers the O&M fees and performs minor repairs and faults with little technical assistance. This model has a negative effect on sustained maintenance; Moreover, the community faces problems of not getting spare parts and support services that are out of their capacities and capabilities.

Model 2: Community management plus, also in this model O&M is also divided or shared by three different parties which are the local community, local authorities and the central government. Table 4 below shows the details of Model 2.

For example, for a hand pump under community management, US\$25 per pump per year is needed for repairs and spare parts, but the community management plus hand pump requires US\$235 per pump per year, but has a life span of ten years whereas the model 1 hand pump has a life span of five years.

Planners and decision-makers do not often prioritize what happens to pumps under construction or schemes in the future - in other words the life-cycle consequences of hand pumps from the investment period. Roughly 30% of Africa's installed hand pumps have started to fail. Getting the cheapest hand pumps or products is not necessarily the best option for the life-cycle of the product; good quality design can reduce maintenance costs as well as decrease the whole life-cycle costs of the water scheme (Bauman 2006).

Table 4 Model 2 community management plus, (Baumann 2006)

<i>Component</i>	<i>Paid by</i>	<i>Cost (\$)</i>
Minor repairs including transport of mechanic	Community	15.00
Spare parts including transport	Community	20.00
Major repairs and borehole maintenance (cost sharing)	Community 30%	30.00
	Local gov't 70%	70.00
Monitoring performance of individual facilities by the districts	Local gov't	30.00
Mechanisms for conflict and problem resolution	Local gov't	20.00
Marketing social facilitation retraining mechanics and communities	Local gov't	20.00
Monitoring performance of O&M system including supply chains	Gov't	30.00
Total cost for O&M		235.00
The cost contributions would be shared as follows:		
The community would need to collect and pay	\$65.00 per pump/yr	
The local government needs to budget	\$140.00 per pump/yr	
The central government needs to budget	\$30.00 per pump/yr	

As mentioned in the report published in 2010 by Rural Water Supply Network (RWSN), in Ethiopia about 35% of the installed hand pumps are non-operational because of either minor or major technical faults. As shown in the graph below in Figure 5, Ethiopia is at the top of the list of sub-Saharan African countries with broken hand pumps.

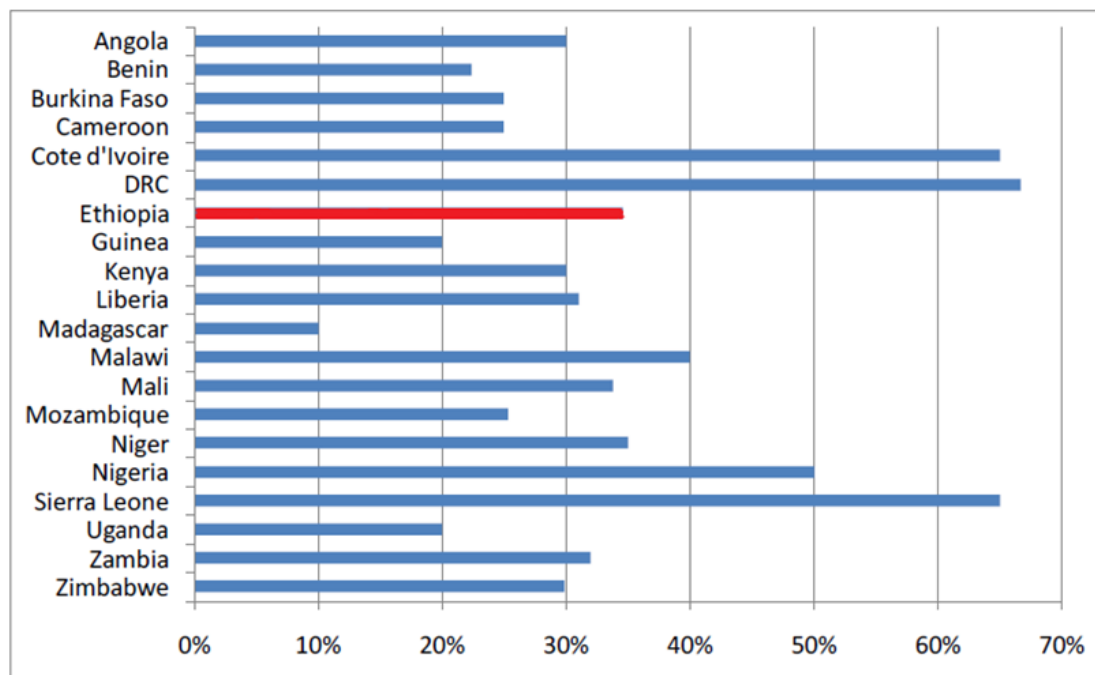


Figure 5 Estimated % of broken down hand pumps in 20 Sub-Saharan African countries, (RWSN)

Many of these failed hand pumps are believed to break down before their projected time line. One major cause of this failure is big concentration on implementations of water points and forgetting the lifetime and life-cycle of the scheme. (RWSN, 2010)

4 Findings and Discussion

Factors affecting the sustainability of water services in rural areas can be categorized into four different categories i.e. technical factors, social factors, reliable gender empowerment & equity, financial elements and comparison of CMP & non-CMP. All these categories will be discussed below.

4.1 Technical factors

Technical factors primarily include some technical issues affecting the water scheme. They will be discussed in the following chapters.

4.1.1 Functionality and non-functionality of schemes

Functionality refers to a condition whereby the system provides water to the users. Therefore, the scheme is said to be fully functional when the quantity and quality of the water point is sufficient so that the people can fetch water from it. Though it is controversial, a shortage of water or less discharge of the well can't fully satisfy the criteria of a functional and non-functional water scheme.

Functionality is the first step to check the sustainability of a certain scheme.

Table 5 below shows data comparing how the functionality of RWSEP water points as well as the implementation rate has changed after adopting the CMP approach. For example in Fogera woreda the difference in functionality of older RWSEP water points and RWSEP-CMP is about 10%. Also, the implementation rate of RWSEP and RWSEP-CMP varies between 116 and 281 respectively. Many aspects could be major reasons behind these variations, but the most crucial issue in here is that the CMP approach improved the sustainability of the water schemes in that area.

Table 5 Comparison of functionality rate of CMP, RWSEP-CMP and other RWSEP modalities

	<i>RWSEP Water Points</i>	<i>RWSEP CMP Water Points</i>	<i>RWSEP Functionality %</i>	<i>RWSEP CMP Functionality %</i>	<i>Ph. 3 & 4 CMP Implemented water points</i>	<i>Ph. 3 & 4 RWSEP implemented water points</i>
<i>Woreda</i>						
Fogera	491	350	87.50	97.7	281	116
Farta	378	282	84.00	98.23	342	139
East Estie	354	276	95.80	99.6	285	100
Guangua	474	443	97.40	98.9	438	20

In Figure 6 below, the functionality rate of water schemes is also shown. As mentioned earlier, CMP leads in functionality rate. Major reasons that caused these different could be high community participation, high ownership feeling, spare part availability and full technical capabilities in those areas.

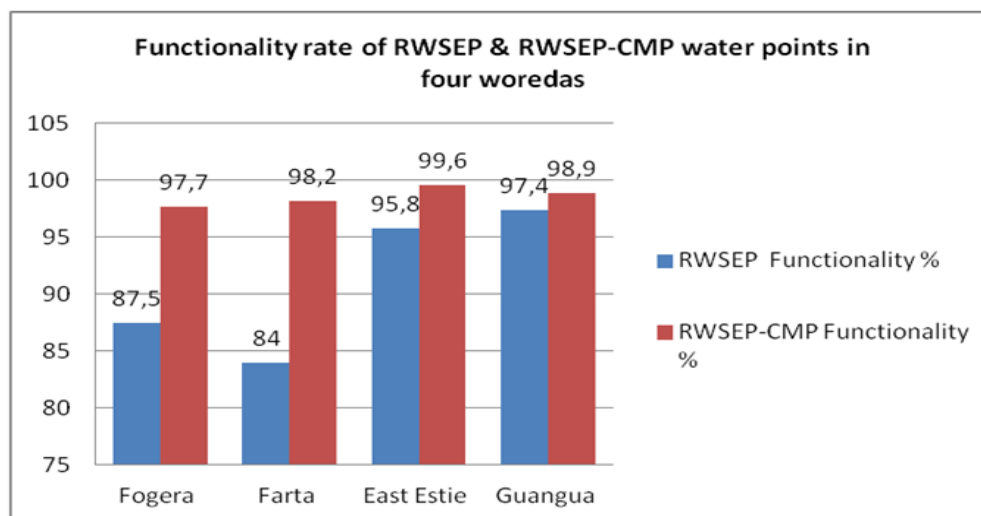


Figure 6 Comparison of functionality rate of RWSEP & RWSEP-CMP water schemes in four woredas

As shown in Figure 6, the minimum functionality percentage of CMP water points of these four Woredas is above 97 and have an average functionality of 98.6%, whereas RWSEP ones have an average of about 91.2%.

In East Estie Woreda, two past schemes constructed by RWSEP and GOE completely stopped functioning due to the lack of ownership feeling. According to the local community in the area, before the break down both of the water points used to open during the whole day and were eventually abandoned, but none of the four non-functional CMP water points visited have a negligence problem or failed due to lack of ownership, but had minor spare parts and water shortage problems.

As mentioned earlier it is somewhat premature to put the scheme in the list of non-functionality as long as it provides water. Plenty of CMP water points face water scarcity or water shortage during dry seasons, but still the discharge of the wells is enough for drinking usage. It varies from scheme to scheme: some schemes provide up to 160 liters per household per day, whereas others only give 20 liters per household per day.

As shown in Figure 7, about 37% of the respondents fetch only 40 liters of water per household per day of water. A household consisting of 10 family members must have 4 Liters per person per day, which is insufficient and well behind the rural UAP target of 15l/c/d per capita per day for service radius or distance of less than 1.5km and also below that of African rural residents' of 30 to 40l per person per day and majority of people are very much concerned about this water shortage problem (MOWE).

In water points with a shortage of water, the majority of the beneficiaries suggested getting an additional water point or at least increasing the depth of the well. That could be the only way they believe to ease water scarcity problems. Non-sufficient depth drilling is what the beneficiaries believe to be the main reason for the lower discharge. In Guangua Woreda the average depth of

schemes is 15m and still that's not enough to meet the water needs of the local users. However, the reasons could be different. It could e.g. be the hydrological nature of the area. This needs some scientific geological research in order to clearly identify the source of the problem.

One of kebele members in East Estie Woreda, where both CMP and non-CMP are operational, believes the reason that CMP and non-CMP schemes have a different discharge is due to shallowness. He participated in some scheme constructions and pointed out how CMP water points are not shallow as those of non-CMP ones and perform better discharge. In general, this is a common problem in dry seasons in both CMP and non-CMP schemes.

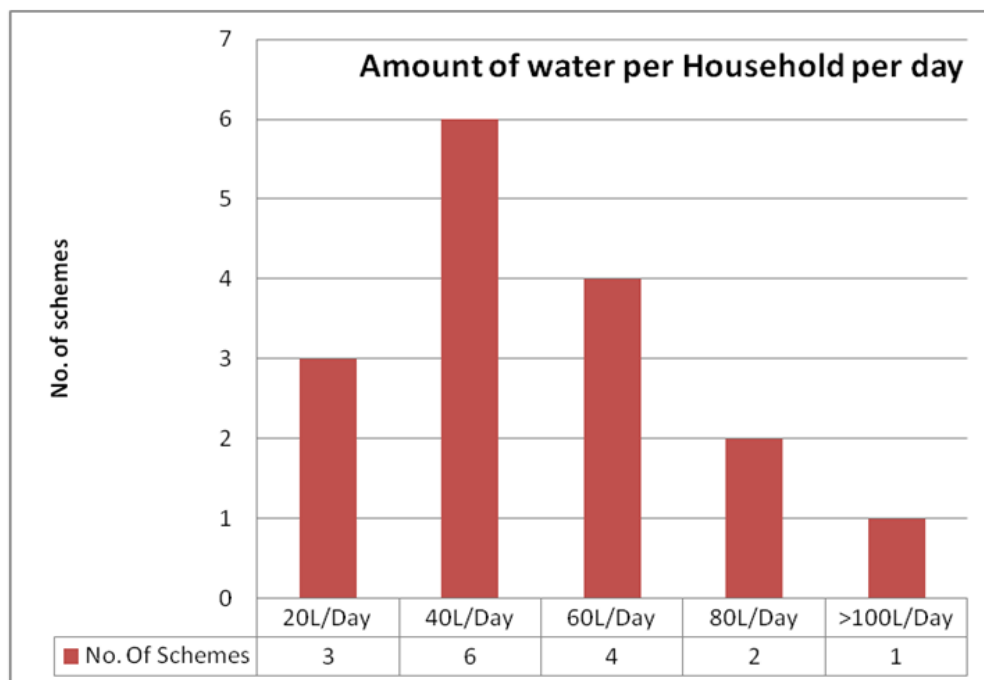


Figure 7 Amount of water users fetch per household per day in the study area.

In the rainy seasons, the shortage of water almost or completely disappears as the ground water table increases and the users' dependence on the water points decreases. According to beneficiaries, in the rainy seasons there are other alternatives; e.g., water sources like streams, rivers, water from their roofs or gutter and other surface waters. This eases the water shortage problem of the local community.

In Figure 8 below shows an abandoned water scheme. This scheme functions only during the rainy seasons, but does not work in the dry seasons.



Figure 8 Shortage of water abandoned water scheme

4.1.2 Technical capabilities

Sufficient technical capabilities is one of the bedrocks of sustainability. Technical capabilities are very necessary in order to guarantee a functional and sustainable scheme.

After an implementation of a scheme WaSHCO volunteers are trained for the scheme management and protection for three to five days.

As seen in Figure 9 below 47 % of WaSHCOs who met during the data collection had a training period of five days, where the remaining had two to four days of training.

A majority of WaSHCOs told that they have enough training to be capable to manage their scheme, but did not rule out the need for extra training if it is available. Almost all of the WaSHCO members were very proud of their responsibility of the scheme and their community. A majority of them stated how they are respected among their societies and are willing to continue this voluntary task for their communities.



Figure 9: WaSHCO's training period

4.1.3 Local contractors or artisans

In every CMP Woreda visited, there are artisans trained for the installation, construction and maintenance of schemes. They had been training for two months (in both theory and practice) until finally they were certified to construct one hand dug well (HDW) and one spring.

In some areas like East Estie and Guangua woredas, there is a shortage of artisans, according to the Woreda Water Office (WVO) officials of those areas. Consequently, other artisans are hired from neighboring woredas, but on the contrary this was objected to, by the local artisans of these Woredas, and they ruled out the need of extra artisans and for most of them are even jobless in majority of working days. Regardless of the situation, all are concerned about the payment decrease affecting the artisans.

According to local artisans and WVO in EFY 2004, artisan payment has been reduced almost up to a half. Some artisans are not even aware of the reason for their payment cuts. Before the payment cut, artisans were paid based on the task done.

Artisans mainly perform masonry works, supervision of users digging wells, installing hand pumps and other technical labor, but according to COWASH officials, diggers have claimed they deserve to be paid for the digging task rather than the artisans, who are merely performing supervisory labor. Then the zone officials disregarded the complaints of users and decided to pay the artisans only on the basis of work done like supervision, masonry and technical works; as a result, the payment fee of the artisans even grew compared to previous year of EFY 2003.

As seen in Table 6 below, artisans have endured an average payment cut of about 70% in both HDW and SPD wells. All the artisans interviewed for this study voiced grievance with the increasing cost of daily life and decreasing payment.

The most significant opposition toward these payment cuts lies in areas where there are Care International-trained artisans like East Estie, because CMP arti-

sans reported that they used to earn more money than those in Care, but presently, Care artisans' pay outstrips that of their counterparts, since payment cuts only influenced CMP artisans.

TABLE 6 Payment change of local contractors (artisans) according to artisans

Type of Well	Payment (Now in Birr)	Payment (Previous in Birr)	Payment cut (Birr)	Cut in %
HDW	2000	6000	4000	-67
SPD	2500	9000	6500	-72

As shown in Table 6 below, according to COWASH officials, the artisans' payment increased by 2%. There remain some contradictions between the two sides.

Table 7 Payment change of local contractors (artisans) according to COWASH

No.	Description of activity	2003 EFY(old payment amount)	2004 EFY(new payment amount)
1	Well digging to depth of 15 meters including dewatering	1361	560
2	Cylinder production and installation	1364	1920
3	Well head construction	851.24	1243.2
	Total	3576.2	3723.2
		Before	Now

4.1.4 Maintenance and availability of spare parts

There seems to be no problem in spare part supplies in almost all of the five Woredas. In Woredas like Farta and East Estie, there are RWSEP furnished spare part stores, where the entire scheme spare parts are available.

These stores were furnished by RWSEP via a revolving fund. This means RWSEP that bought all the spare parts by itself and then sells them the beneficiaries at a low cost price compared to the local private spare part suppliers. This is a non-profitable system adopted to assist users and to get good quality parts at an affordable price.

These stores are furnished once per year or once in two years, whenever there is a shortage of some special parts.

Though these stores eased spare part supply problems in these areas, still there is a short-term problem, which is the increasing inflation rate in supply markets.

According to one local storekeeper, prices which materials are sold do not sometimes buy the same amount of equipment, since stores are at a non-profitable policy and this could be a drawback to the future existence of stores. Some spare part stores suffer from smaller storage space for spare parts, because some stores are used for multi-spare part storage like agricultural spare parts and other construction parts.

In East Estie Woreda, RWSEP store operates for both CMP and non-CMP customers, where it provides spare parts to both beneficiaries. This represents a good example of the mutually beneficial relationship between CMP and non-CMP stakeholders.

In Woredas (like Fogera) where there is no RWSEP owned spare part suppliers, there are private owned local suppliers. The employees of these local suppliers were trained for one to three days by the Woreda Water Office (WWO) in order to upgrade their spare part material knowledge and to be aware of supplying low or poor quality equipment, which might impair the scheme sustainability. Therefore, this short period training could play a vital role in achieving a sustainable water scheme.

Local private stores sell spare parts at a bit higher price than RWSEP furnished stores and still they have their own market and customers. Although there is no systematic data, in Figure 10 below are shown materials which are mostly sold by customers and the differences in prices of RWSEP spare part suppliers over four years.

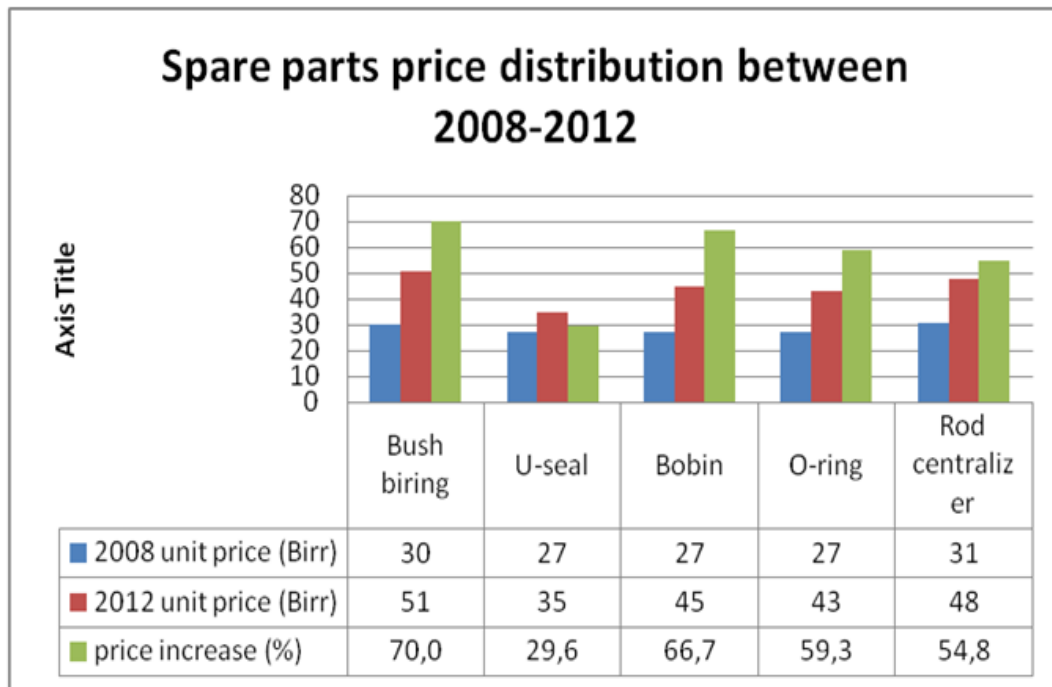


Figure 10 Price change of Afridev hand pump spare parts between 2008 & 2012.

One significant problem is the inflation rate of spare parts. As shown in Figure 10 above in a period of four years the unit price of each fitting grew substantially. There is an average 56% of unit price change of these fitting spare parts in these four years. The Operation and Maintenance (O & M) fee was supposed to grow to cope with this dynamic price, but there is no one encouraging beneficiaries to do so. In the long run this could be a major problem in the affordability of users to buy spare parts with their O & M money and this is threatening the sustainability of the scheme in general.

4.2 Social factors

Although social issues affecting sustainability are many and complex. Three main issues will be discussed in this chapter. They are community participation, ownership feeling and willingness to pay.

4.2.1 Community participation

Community participation in all aspects of the project starting from planning, implementation up to the post-construction is one key issue of the sustainability of a certain community project. CMP, as declared in its name has more community participation than any other such type of project. Ninety-two percent of the total CMP respondents contributed to the implementation phase of their scheme in different ways as seen in the graph shown below in Figure 11.

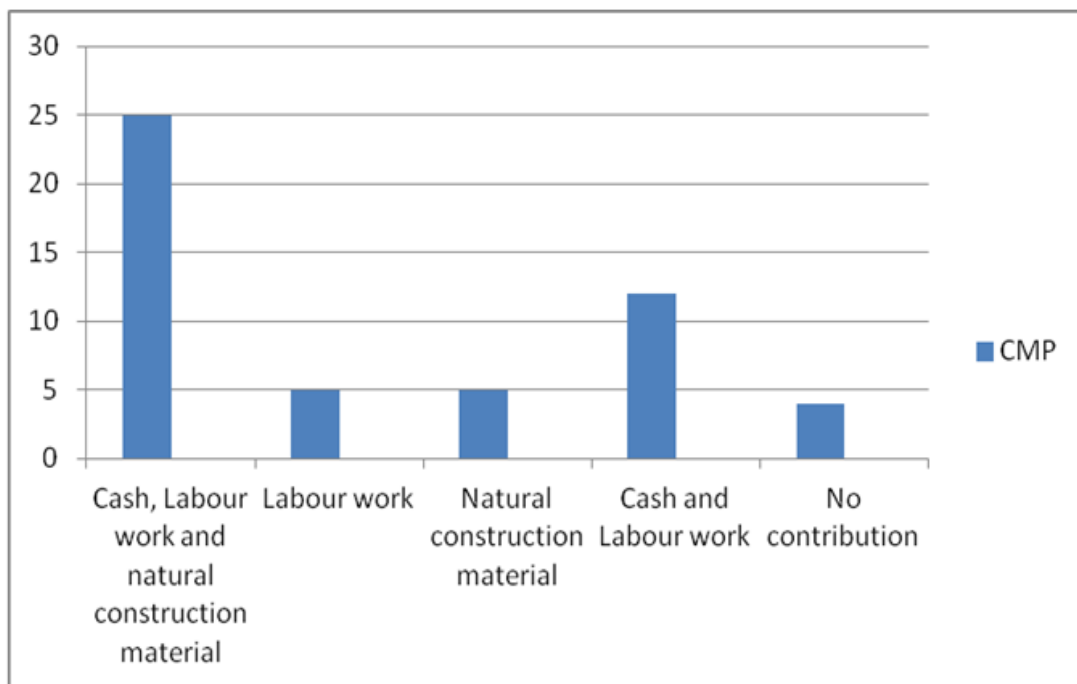


Figure 11 Beneficiaries' different contribution in scheme implementation.

Figure 11 shows the contribution graph of the different beneficiaries. About 50% of the respondents contributed in cash, labour work and collecting natural construction material, whereas other 50% contributed in another way. Basically those who cannot afford to pay in cash can contribute in labour work or providing natural construction material like gravel, sand and other related materials.

In Fogera woreda, as shown below in Figure 12, in one CMP spring scheme under construction, the community participation in its construction was strong. Women, children and men were all taking part in the construction work, plus all 50 household beneficiaries had already had their ideas of site selection in the planning phase of the scheme and their 20 Birr contribution fee for the implementation of the new water point. Their mood was so high that they were planning to organize an opening party for the scheme after construction finishes.

That was a telling example of how people are eager to be involved even in the planning and implementation phases rather than only in post-construction. Majority of the people who were not participated in scheme development are aged people, sick people and people moved from other places.



Figure 12 Local beneficiaries participating the construction of a spring scheme.

4.2.2 Ownership feeling

Ownership feeling is directly or indirectly related to community participation. A real ownership feeling means the feeling that one feels property as his own asset or property. It has been a long-standing hardship to persuade users that schemes are theirs, but all the CMP respondents interviewed insisted that schemes belong to them and that it is their own responsibility to protect, fence and sustain it. In addition, it is obligatory for each and every member of society to take his part of the scheme responsibility.

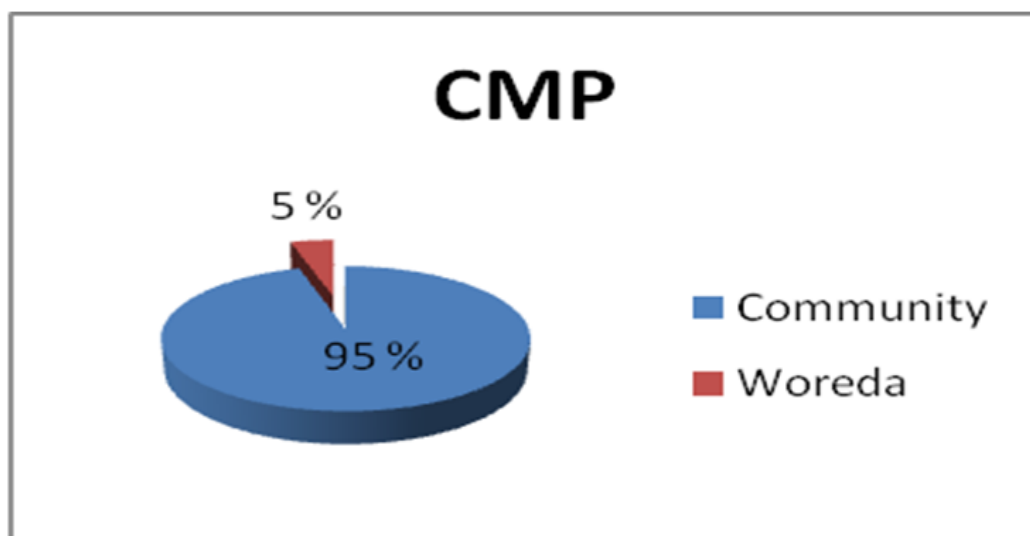


Figure 13 Owners of the scheme.

Looking at Figure 13 above, 95% of the total respondents clearly declared that schemes are the assets of the society and this cancels out an earlier ideology of regarding schemes as international NGOs gift to the community, which finally caused many schemes to fail.

As shown in Figure 14 below, two-thirds of the CMP schemes visited had guards to protect, either paid or not paid. The majority of those guards are paid monthly by beneficiaries, whereas non-paid guards do this guarding work in turns or shifts, meaning every household takes the guarding responsibility of the scheme for a certain period of time.

In some schemes, small houses or cottages were built beside the water point for the shelter of the guards during the guarding time. Some of the remaining un-guarded schemes have neighboring houses nearby.

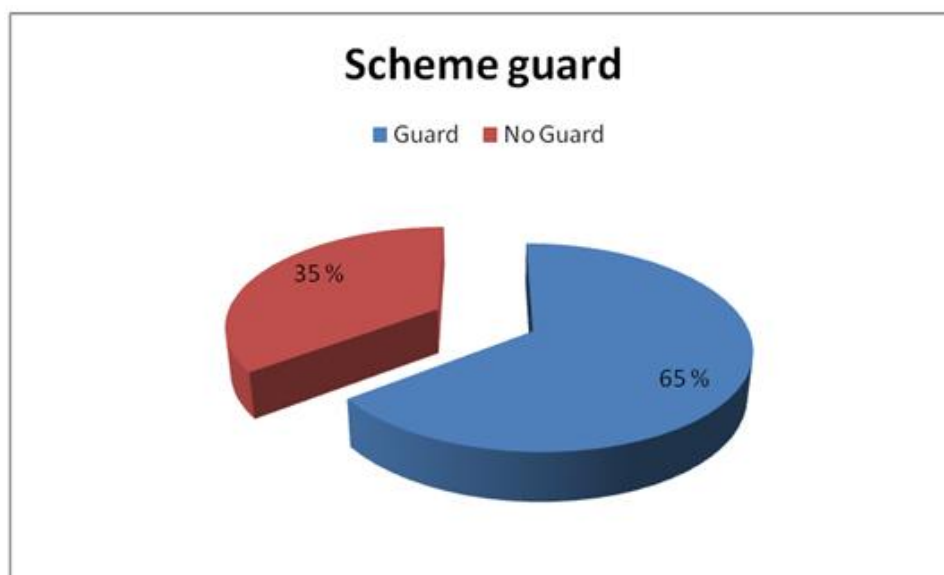


Figure 14 Number of schemes having a guard in %.

4.2.3 Willingness to pay

Willingness to pay the water tariffs reflects the user's ownership feeling. Many are reluctant to pay for such a natural, essential resource. As seen below in Figure 15, the willingness to pay is high in CMP and it is over 90%. In this chart below it is understood how eager the community is to pay the small service fee for O&M, another good sign of achieving a sustainable scheme. The same people from the same area and at the same time have different attitudes towards paying water tariffs. This could be because of dissatisfaction of beneficiaries with the scheme itself or the committee managing the scheme or some other hidden issues.

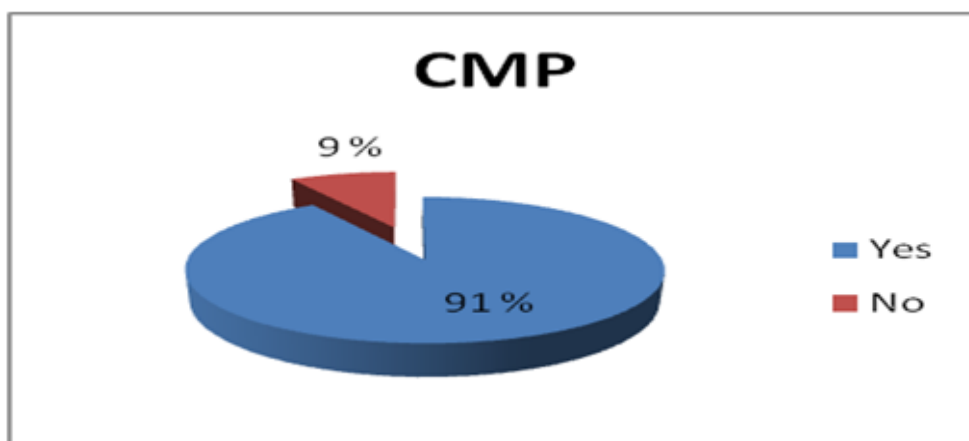


Figure 15 Respondents' willingness to pay water tariffs of the scheme.

Other members of the community may not understand why to pay and the overall objective behind water tariffs and this is in a way more or less related to the literacy and ignorance of the community. In this case, a strong social awareness is needed to boost understanding.

4.3 Reliable gender empowerment and equity

Gender empowerment and equity are major issues of developing countries to establish a system based on the same rights of both genders in social management tasks.

4.3.1 Women empowerment

In CMP, women's role is one of the cornerstones of the approach, unlike other NGOs. Women play strongly in the scheme management. A majority of WaSHCO committees in these areas are dominated by women. WaSHCOs have a gender combination of three females and two males, plus the chairperson in the majority of CMP water schemes are women. Therefore, this is a forward step in women's empowering strategy in rural areas.

In the primary data collection of this research, it's identified that women have a solid role in decision making in water point management and have the support of their fellow local society. They also play a significant role in managing the system's finances.

Women do not only participate in decision making and management of the scheme, but they also take part in scheme protection, sanitation and hygiene. During this research it was found that people doing cleaning and sanitation work in the water schemes are women. Figure 16 below shows WaSHCO chairwoman giving information about her scheme.



Figure 16 WaSHCO chairwoman being interviewed during this thesis research.

In CMP, women also have their share in technical works like having their members in local artisans' organization as shown in the graph of Figure 17. CMP trained a number of women as artisans in woredas such as East Estie, Farta, Fogera and Guangua. In Guangua woreda 11 out of the total 36 CMP trained artisans are females that make them about 30% of all artisans in the Woreda. Also, in East Estie woreda about 13% of the Woreda artisans are women, whereas Care International who is also a potential donor in scheme implementations in that area has no female artisans out of their 39 trained artisans. Therefore, this evidences how CMP is a leading approach in improving women empowerment, and also creating job opportunities for females.

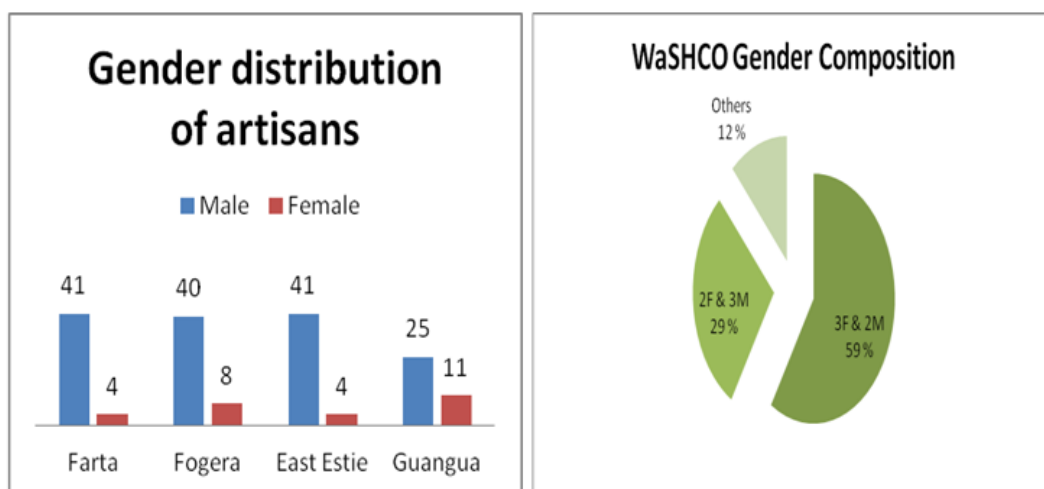


Figure 17 WaSHCO & Artisans gender combination.

Since women are leading in gender composition of WaSHCO, there were no major signs identified during this research of male opposition against women's role in WaSHCO combination.

In some areas like Awi zone, women involvement in scheme management seems to be less than that in South Gondar zone. In some schemes of Awi zone there are educational pre-requisites for females joining the WaSHCO members like having only literate females as a WaSHCO member and some few respondents believe that it is not possible to see better women performance than men.

As shown in the chart of Figure 17 above the management of the schemes are dominated by females. Only 12 % of the schemes had gender ratio combination of 3 males only or 4 males and 1 female. Also, in the graph part of Figure 17 it is shown the number of female artisans. Though this is a technical work and is dominated by males, still women's role is visible and they make 16% of the local artisans in those areas.

4.4 Financial Element

The financial element is one of the most important and critical points of achieving a sustainable water scheme. People have different views and attitudes towards paying for water services as every one of us believes that he/she has the right to get water. Maybe a few of us also believe that it is right to pay for our water services in order to keep it sustainable for the next generation. This chapter will discuss the overall financial contribution and management of water schemes in CMP.

4.4.1 Operation and maintenance (O &M) fees

In almost every CMP water point, money is collected every month or year for the operation and maintenance of the scheme. Beneficiaries pay 1 birr per household per month (1Birr/HH/M) or 12 Birr per household per year (12Birr/HH/Y) as a service fee. Over 99% of the users met during this study pay this money and there seems to be no problem in tariff payment of the beneficiaries. Some of them even suggested to increase this fee and justified it as it is very low and affordable to them.

Basically, each water point is shared by 50 households and that means that an amount of money of 600 Birr is collected in each year for O & M. Then that money is saved in Amhara Credential and Saving Institutions (ACSI). This money is used for the maintenance of the scheme in terms of breakdowns, guarding, fencing and other necessary issues for the scheme.

Few members of two water points out of the 16 CMP water points visited did not pay water tariffs. Some claim that they cannot afford the service fee, though WaSHCO members dismissed that claim; still they use water with other beneficiaries. In some schemes an amount of money of up to 2000 Birr is saved

and that is a big bonus for them so that they can even establish an additional scheme in the future if they keep paying water tariffs.

This money does not always come from the water tariffs paid by the users but also from selling grasses grown in communal lands or getting compensation money from roads constructed in their living areas. The federal government compensates for the local communities when new roads are constructed and this money is given to the community. Then the community uses this money for scheme management and development.

The majority of the schemes receive some kind of compensation money and people do not pay water fees, since they already saved enough money. This could be a problem in the future if tariff fee is needed to re-collect after the saved money runs out. There are also some schemes that already got compensation money and at the same time pay the service fee.

CMP's policy of users' full responsibility in terms of maintenance and operation has worked well; this is also one reason for scheme functionality. If a minor failure happens, it is easier to fix, since they have saved enough money.

Every respondent was happy with WaSHCO's money collection and saving process and they admitted that everything was transparent since money is in the hands of a third party (ACSI). WaSHCO have their own account in ACSI and they have an auditing task in every three months.

As shown in the graph of Figure 18 below, roughly a majority of CMP schemes save for O & M an amount of money of about 300 to 800 Birr. Comparing this to the annual increase of spare part cost will not help. Therefore, one solution could be increasing water tariffs in order to avoid devaluation of money, but there are no signs showing local users' future plan of increasing the service fee.

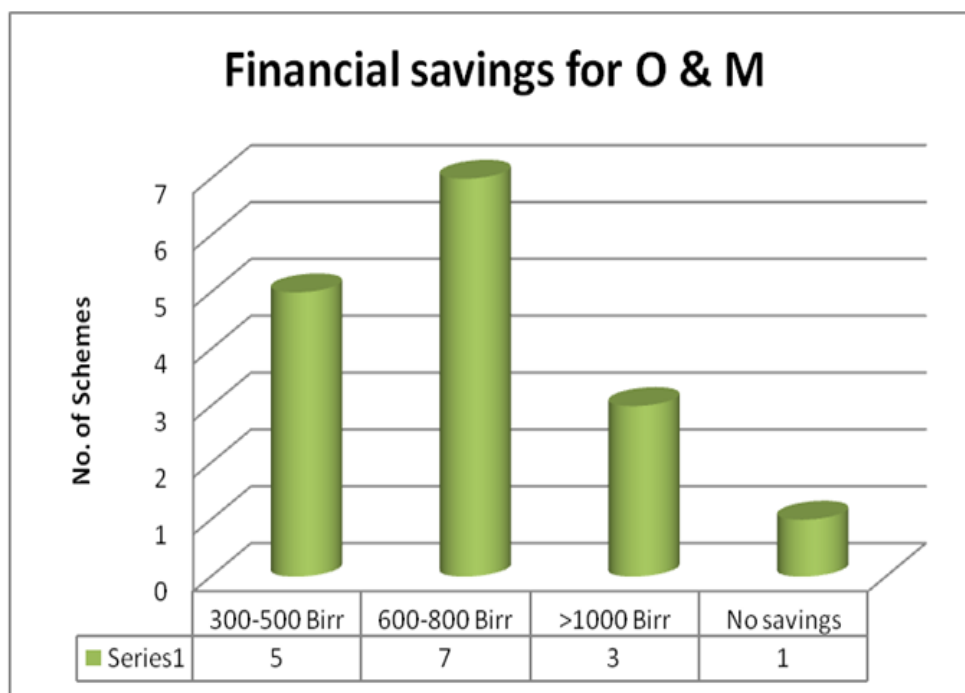


Figure 18 Number of schemes and amount of financial savings for O & M.

As seen in the graph the majority of the schemes pay the service fee except one scheme which belongs to Farmers Training Center (FTC). But nowadays it is used by the local community. Though its protection was not as good as that of the others, the users were ready to take its responsibility if it is handed over to them. It could be a good idea if users are organized and encouraged to pay water tariffs and the water point is handed over to them instead of depending on FTC.

4.4.2 Sustainability and Cost recovery

Cost recovery is a tool for the long-term scheme sustainability. Still the mentality of beneficiaries of getting a new scheme after a major scheme failure happens is very strong as shown in Figure 19 below. If this ideology is not crossed out there will not be a full sustainability in the rural water service system.

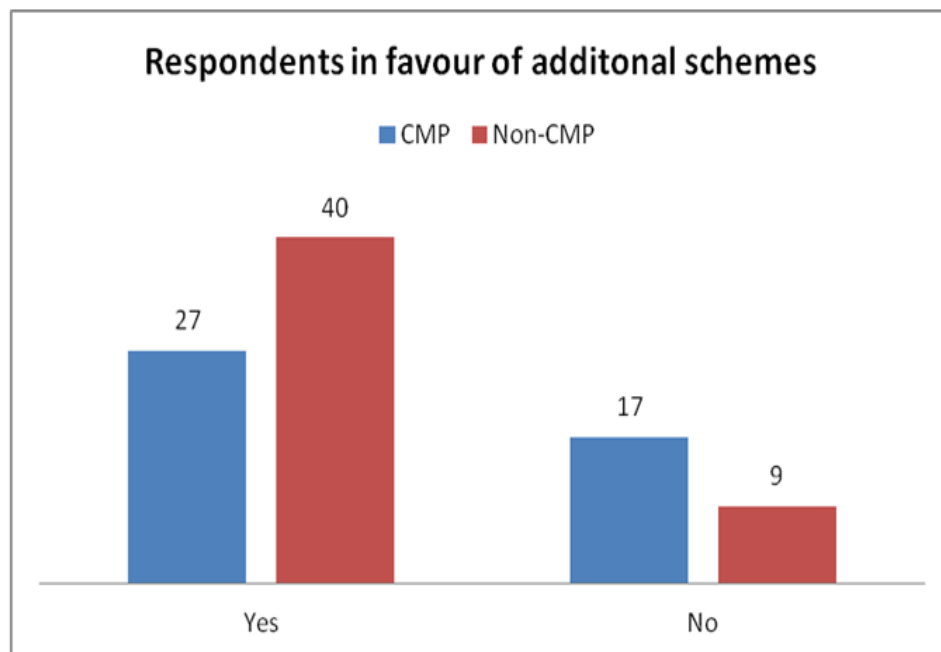


Figure 19 Respondents of both CMP & non-CMP modalities in favor of getting extra water scheme

One way to tackle this problem could be encouraging people to save some separate fee as a cost recovery. It is possible that each household makes a contribution of 50 birr per year after farmers do harvesting and sell their crops and the economic situation of the family is better than in any other period of the year. In four years' time, there is a possibility that one water scheme collects roughly 10 000 Birr and could rehabilitate and change the water scheme as major failures occur.

There were no signs of any kind of cost recovery encouragements, either from the community or administration. Adopting this policy of cost recovery could be a good way of sustaining schemes as well as the scheme existence in the long run.

Getting additional water points in the water shortage period is what people mostly suggest when asked "From whom are you expecting this additional water point," simply they will say "From donor NGOs or from government." Therefore, if this strategy of cost recovery would be encouraged, it would decrease beneficiaries' dependence on donors only to rehabilitate schemes or implement newer ones.

5 Comparison of CMP and non-CMP

The following data does not reflect entirely the two modalities in the whole Amhara region, but are only based on the areas where this research was conducted. Amhara region has more than a hundred districts or woredas. Therefore, data collected from five woredas cannot represent the entire Amhara region, but could provide good hints for the other woredas in the region.

5.1 Contribution of beneficiaries to the scheme implementation

As a matter of fact, both CMP and non-CMP beneficiaries participated in the contribution of schemes through different ways and their rate of contribution was high. The means of contribution of each differs. In CMP beneficiaries, they mostly contributed by cash or cash and labour together, but in non-CMP contribution, labor is more prevalent, and that could be the reason why the majority of the beneficiaries contributed by labour.

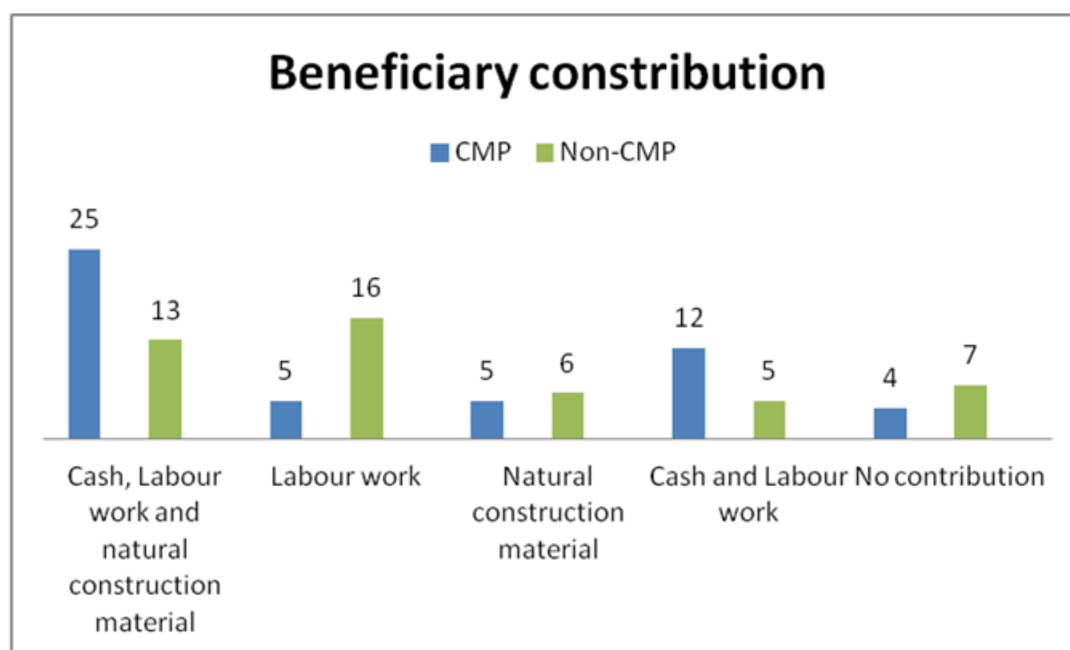


Figure 20 CMP & non-CMP beneficiaries' contribution in scheme development

As shown in Figure 20 above CMP contribution shows higher than that of non-CMP, i.e. 92% of CMP beneficiaries contributed either by cash, kind, natural construction material or other ways of contribution in scheme implementation, whereas 85% of non-CMP contributed the same. Therefore, this indicates how community participation of CMP schemes is well ahead of those in non-CMP. One Care International officer in Farta Woreda who was interviewed confessed

that CMP's best kept secret is users' high mobilization, which is why CMP has a high scheme functionality rate comparing to any other non-CMP schemes. "One day all non-CMP NGOs like Care International and others will take the CMP approach tool," he added.

If the community involvement is high, it has an impact on the ownership feeling of beneficiaries. In all water points constructed by CMP had a community participation share of up to 1000 Ethiopian Birr plus labor and raw material contribution, whereas other non-CMP, kind and raw material were the major contribution of the beneficiaries.

Both CMP and non-CMP WaSHCO committees are very committed to continue in their responsibility to their local society, though they are not paid for it. The majority of them even believe that the responsibility of being part of the WaSHCO committee gave them a reputation and respect among their local communities since they work voluntarily.



Figure 21 Children watering their cow in Red Cross built scheme

In one Care International scheme, children are forbidden from using the hand pump or even to fetch water. This is done for the sake of the protection of the scheme. If this policy would be applied in all other CMP and non-CMP schemes it would lower scheme breakdowns, since many respondents stated that minor failures of schemes are due to children's hand pump misuse. In Figure 21, above it is shown children watering their cow in the scheme. This bears shows a sign of responsibility missing of the scheme.

As seen in Figure 22 below, there has been a huge cut in payments. This is how CMP artisans compare themselves to that of Care International. They believe that it is not fair to earn a lower payment while a Care International artisan earns a bigger sum of money while performing the same job.

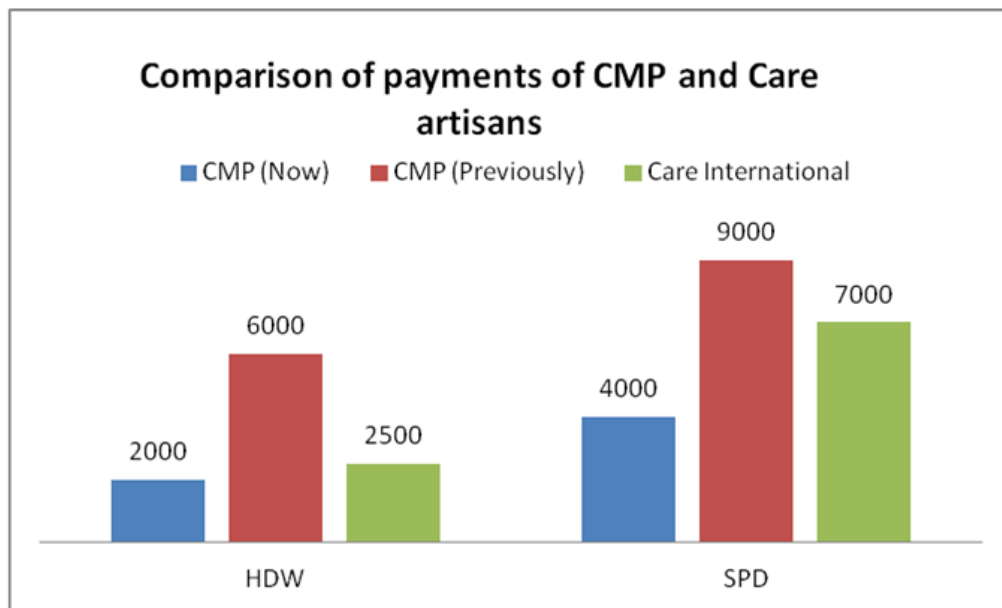


Figure 22 Comparison of CMP artisans' payments of current and previous with Care International artisans.

A majority of non-CMP women interviewed showed their willingness to alter gender makeup. It was difficult for them to say straight away “we are not happy with WaSHCO gender combination”, but while they were asked in a bit tricky way like “Would you like to see women having a better share in WaSHCO gender combination than now?”. They all replied “Yes”.

This study compared the community participation of both CMP and non-CMP schemes in terms of planning, contribution, site selection as well as implementation phases of scheme construction. In non-CMP water points like Care constructed water points, users pay only 0.5 Birr/HH/M. This money is collected and saved by a cashier, who is a member of WaSHCO. Though they did not report any kind of financial mismanagement or misuse made by the cashier, still there is a risk of corruption. In some other non-CMP schemes there are no service fees and they only collect money for a guard, if there is a guard.

As seen in Figure 23 below ownership of the scheme seems to be more in CMP beneficiaries compared to their non-CMP counterparts. Majority of CMP beneficiaries or 95% of them regard the scheme as their own assets, whereas figures from non-CMP are 80%.

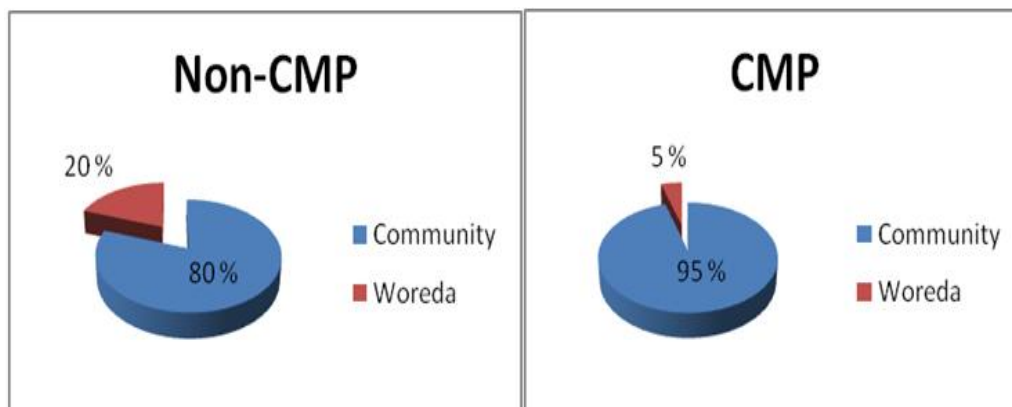


Figure 23 Owners of the scheme.

In non-CMP schemes where only 0.5 Birr is paid per month, it is very difficult to cover O & M costs, which is why many users believed non-CMP schemes remain unmaintained for a long period or even abandoned because of minor failure.

Both beneficiaries of CMP and non-CMP modalities were eager to pay for their water services. At least every one of the community knew why to pay and benefits of paying water tariffs.

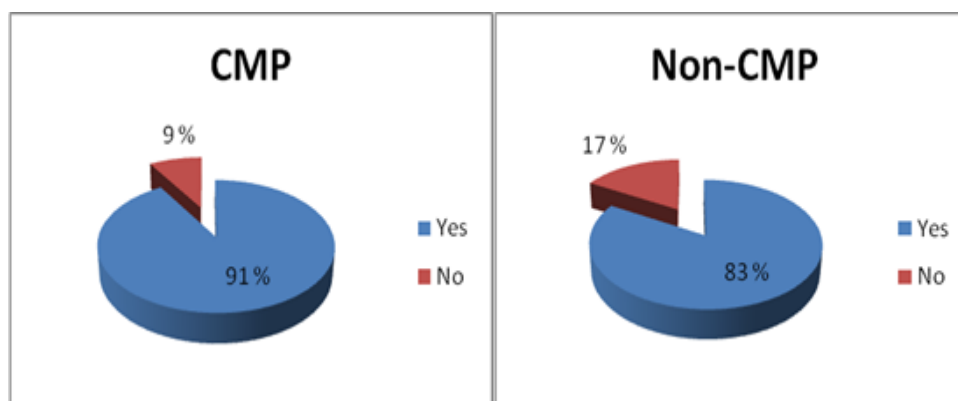


Figure 24 Willingness of CMP and non-CMP beneficiaries to pay for service fee.

Paying a service fee varies from scheme to scheme and modality to modality. As shown in Figure 24 above 91 % of the total CMP beneficiaries were willing to pay water tariffs whereas 83% of non-CMP also had the same view. Non-CMP beneficiaries pay half of the service fees of that of CMP and still CMP participants exhibit more willingness to pay.

6 Conclusion & Recommendations

The general conclusion demonstrates good results in both modalities, but CMP seems to be performing better in terms of factors affecting sustainability like financial elements, community mobilization or participation as well as functionality rate of the schemes. Data collected from only 33 water points cannot reflect the overall schemes of Amhara region, but this gives only brief information about common obstacles that face the sustainability of water points in the region and countrywide. Certain recommendations are offered to solve current existing problems as well as improving the overall sustainability.

6.1 Conclusion

CMP encourages the community's full participation in every stage of the project from planning to post-construction. During this study, a high community participation and ownership feeling were observed. Almost all of the beneficiaries reported that they participate in WaSHCO meetings.

In this study it is discovered CMP's higher rates of functionality, ownership feeling, community participation, community's independent scheme management, willingness to pay and women empowerment. Therefore, these are good evidences for a sustainability of over 90% in CMP approach.

However, there are remaining challenges that need to be eliminated to keep these functioning systems better sustainable.

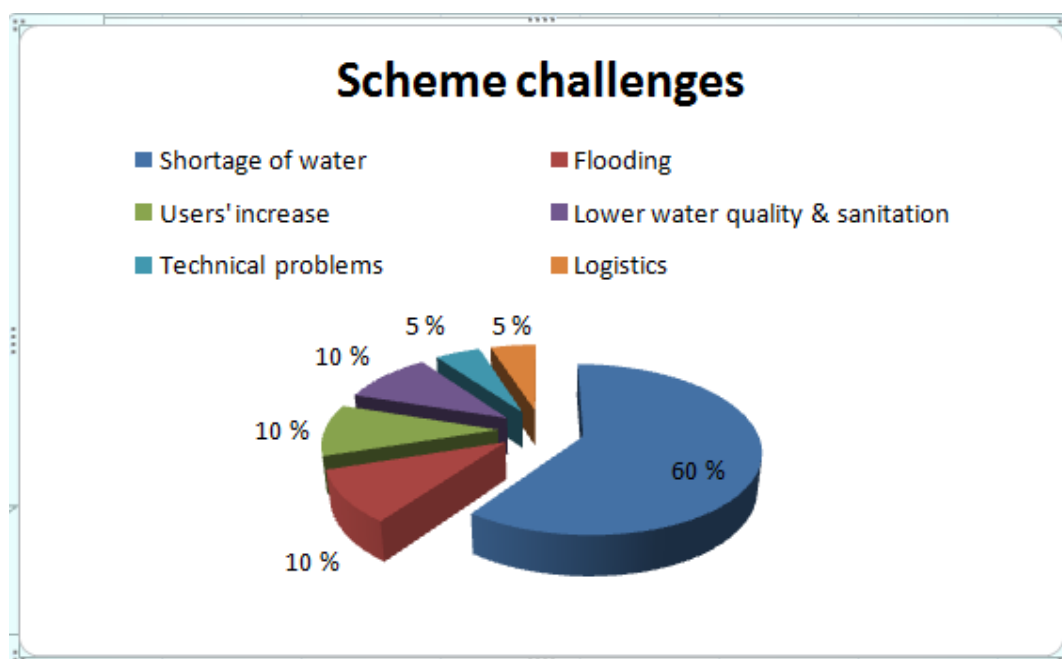


Figure 25 scheme challenges.

As shown in Figure 25, the challenges facing the wellbeing or success of the scheme are shortage of water, flooding, low water quality and sanitation, users' increase, technical problem and logistics. Majority of the people or 60% of the people suffered from shortage of water, whereas lower water quality and environmental problems like flooding are other challenges. CARE international carries out water quality check studies and this is a good step for following and improving water quality.

6.2 Recommendations

Based on the results of the study the following recommendations are necessary for the wellbeing of schemes:

- There should be well organized systematic data saving in all levels: starting from kebele and woreda. Majority of woreda offices have no reliable inventory data.
- Solving local contractors (artisans) payment cuts complaints: Though Amhara zone advisor justified payment cuts, they are not happy with that and if this is not solved this would be a major threat in scheme maintenances and implementation of new schemes too since some of them already shifted to different work places for better payment.
- Encouraging foreign spare part factories to open local branches in order to cope with growing needs and costs of spare parts.
- To upgrade and enhance technical and capacity building trainings of WaSHCOs and local contractors (artisans): Some artisans lack sufficient knowledge in construction and maintenance and ask other artisans for assistance and giving trainings to WaSHCOs to learn how to preserve environmental sustainability, like flooding prevention.
- Dynamic water tariff rate to cope with the dynamic price of spare parts to prevent devaluation of money.
- Improving co-operation and experience sharing between schemes: There is no idea or experience sharing between WaSHCOs and beneficiaries of different schemes
- Encouraging cost recovery strategies among scheme beneficiaries to lower their dependence on foreign assistance, if major scheme failures happen.
- Encouraging water tariffs payment for all scheme beneficiaries in order to prevent other beneficiaries' discourage: Some schemes already saved money and stopped paying the service fee. This could be a problem if service fees are needed to collect once again. This could also discourage other beneficiaries of other schemes as well.

- Improving social awareness of beneficiaries: Some do not know about CMP, while others still stick to older NGO names like Finnida and CDF.
- Increasing the number of Woreda WaSH Teams (WWT): In some woredas, it is difficult to meet with WWT. In some schemes they are rarely seen. One major reason is their small number of members of seven and the sizable tasks under way of receiving application forms from users applying new water schemes and planning newer water points.
- Carrying out water quality check studies like CARE international to follow the water quality.

SOURCES

Abrams, L. (1998) Understanding sustainability of local water services. Accessed 14th Jan 2013
<http://www.irc.nl/page/67592>.

Amhara National Regional State (ANRS). Accessed 20. Nov. 2012
<http://www.amharabofed.gov.et/ANRS/Geography%20and%20Climate.htm>

AMCOW CSOs2, 2009/10, Water supply and sanitation in Ethiopia. Accessed on 17 Nov 2012
<http://www.wsp.org/sites/wsp.org/files/publications/CSO-Ethiopia.pdf>

Awoke 2012, Assessment of challenges of sustainable rural water supply: Quarit woreda, Amhara region. Accessed on 17 Nov 2012 (dissertation thesis).
http://soilandwater.bee.cornell.edu/publications/Zemenu_Awoke_Alemayehu-MPS_Project_Paper.pdf

Baumann 2006, Do operation and maintenance pay? Accessed on 31 Oct 2012
<http://www.rwsn.ch/documentation/skatdocumentation.2009-03-06.0210700241>

Coinmill online money exchange rate. Accessed on 18 Dec 2012
<http://fi.coinmill.com/>

COWASH Quarterly Progress Report, Jan-Mar. 2012
RWSEP 2011 (closure presentation, 2012) Accessed on 17 Nov 2012
http://www.cmpethiopia.org/media/cowash_quarterly_report_january_march_2012

COWASH Biannual report, Jul-Dec. 2011. Accessed on 17 Nov 2012
http://www.cmpethiopia.org/media/cowash_quarterly_report_january_march_2012

Definition of sustainability. Accessed on 14 Jan 2013
<http://dictionary.reference.com/browse/sustainability?s=t>

Ethiopian national census of 2007. Accessed on 15 Nov 2012
http://www.csa.gov.et/index.php?searchword=Population&ordering=newest&searchphrase=all&Itemid=98&option=com_search

Ministry of water and energy of Ethiopia, Universal access plan. Accessed 18.Nov.2012
<http://www.mowr.gov.et/index.php?pagenum=2.4>

Ministry of foreign affairs of Ethiopia, About Ethiopia. Accessed 11 Oct. 2012

<http://www.mfa.gov.et/aboutethiopia.php?pg=1>

Mommen & Nekesa, 2010, Connected hand pump mechanics for unimproved service delivery : A key study of district-based associations of hand-pump mechanics in Uganda as a supporting mechanism. Accessed on 22 Nov 2012.

<http://www.irc.nl/page/55923>

Online Dictionary, Meaning of the word "Sustainability". Accessed 15 Jan 2013

<http://dictionary.reference.com/browse/sustainability?s=t>

Rural water supply network (RWSN) perspectives no. 4, 2010, Myths of rural water supply sector. Accessed 01 Nov 2012

<http://www.rwsn.ch/documentation/skatdocumentation.2009-07-27.8158674790>

RWSEP Phase 1 Completion Report, 1999

RWSEP Phase 2 Completion Report, 2002

RWSEP Phase 3 Completion Report, 2007

RWSEP Phase 4, Annual Report, 2003 EFY

The African water page, Understanding sustainability of local water services. Accessed on 14 Jan 2013.

<http://www.africanwater.org/sustainability.htm>

Tsehay & Gabremedhin 2011, Empowering rural people through the Community Development Fund (RWSEP closure presentation Bahardar 2011). Accessed on 14 Jan 2013

(<http://cmpethiopia.files.wordpress.com/2011/11/presentation-of-the-rwsep.pdf>)

Vanderbilt university, What is sustainability?. Accessed on 15 Nov 2012

<http://www.vanderbilt.edu/sustainvu/who-we-are/what-is-sustainability>

WaSH technical report no. 94 of Sustainability of donor-assisted rural water supply projects (<http://www.washdoc.info/docsearch/title/112948>. accessed on 22. Nov. 2012)

Wikipedia, meaning of sustainability. Accessed on 18.Nov.2012

<http://en.wikipedia.org/wiki/Sustainability>

WSSCC (Water Supply & Sanitation collaborative council, Rural water supply). Accessed on 15 Nov 2012

<http://www.wsscc.org/topics/water/rural-water-supply>

BACKGROUND OF RESPONDENTS

Background of the respondent

Respondent background	Male 57 Female 41
Age	10-20 8 21-30 28 31-40 30 41-50 18 >50 14
Marital Status	Married 81 Unmarried 12 Divorced 4 Widow 1
Education	Never been to School 53 Primary 29 Secondary 6 Adult education 8 University 2
Household Size	<5 39 5-10 56 >10 3
Occupation	Farmer 80 Business 6 Labors 9 Private workers or Government employee 3