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DELIVERING WATER, SANITATION AND HYGIENE SERVICES
IN AN UNCERTAIN ENVIRONMENT

Strategies to reduce the non-functionality of water supply schemes in Kedida Gamella Woreda, Ethiopia

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This paper presents a pragmatic and scalable approach to reduce the non functionality rate of rural water supply schemes that are found in Kedida Gamella Woreda, southern part of Ethiopia. The study first assessed the current state of water supply schemes in Kedida Gamella Woreda[1], that helps in pin pointing one of the issues that is directly associated with non functionality rates of water supply schemes in the woreda, which is the preventive operation and maintenance approach. This is because the approach enhances capital equipment productive life, reduce critical equipment breakdowns, allow better planning and scheduling of needed maintenance work, minimize unavailability of water due to equipment failures, and promote health and safety of maintenance personnel.

Introduction

Ethiopia like many other countries in Sub-Saharan Africa has low levels of water, sanitation and hygiene facilities and practices. According to the Federal Democratic Republic of Ethiopia Population Census Commission Report, December 2008, the annual population growth rate of Ethiopia is 2.9 %; this makes Ethiopia as one of the fastest growing countries in Africa. 73.9 million People, 84% live in rural areas. Based on the latest Water sector Development Report from Ministry of Water resources (MoWR, 2011); Ethiopia's national safe water supply coverage reaches 68.5% (65.8% rural and 91.5% urban). However, it is estimated that 33% of the rural water supply schemes are non functional at any time.

Case study area

Kedida Gamela is one of the woredas under Kembata Tembaro Zone (KT) of Southern Nations, Nationalities and Peoples' Regional State (SNNPRS) of Ethiopia. Kedida Gamela is bordered on the south by excave of the Hadiya zone, on the southwest by Kacha Bira, on the west by Angacha, on the north by the Hadiya zone, and on the east by the Bilate River which separates it from Alaba. Figure 1 below shows the map of SNNPRS.

Facts about Kedida Gamella Woreda

Based on figures published by the Central Statistical Agency in 2007, this woreda has an estimated total population of 90197, of whom 45193 were men and 45193 were women; 4659 or 5.2% of its population are urban dwellers. With an estimated area of 351.25 square kilometers, Kedida Gamela has an estimated population density of 256.78 people per square kilometer. The Safe water coverage at woreda level 39%, zonal level 43% and regional level 56%. Currently, all kebeles[2] in the woreda are open defecation free (ODF) and habit of Solid waste disposal was 71.3%.

[1] A woreda is equivalent to a district, managed by a local government.

[2] Kebele is the smallest administrative unit of local government. Kebeles can best be regarded as a neighbourhood, a localized and delimited group of people

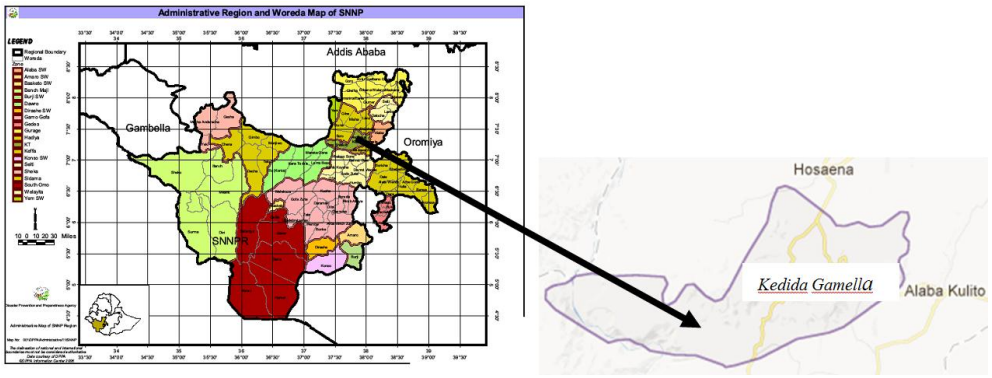

Figure 1. Map of SNNPRS, Ethiopia with Kembata Tembaro Zone and Kedida Gamella Woredas

Source: Google.com and wikipedia.org

Habit of hand washing after latrine has been getting closer to 80.9%. In this woreda, Health Extension Workers are key actors in sanitation and hygiene promotion. The figure below shows percentage of functional and non functional rates of water supply schemes in the woreda.

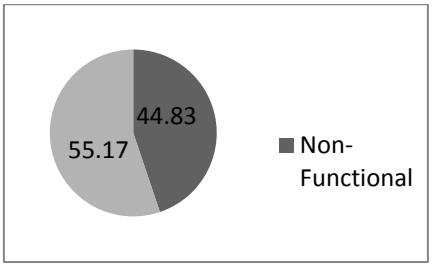

Figure 2. Non Functionality Rate of Water Supply Schemes in General

Source: Kedida Gamella Woreda Water resource office scheme assessment report

Baseline survey

A survey undertaken in December 2007 in 6 Woredas[3] of Southern Nations Nationalities Peoples Regional State (SNNPRS) of Ethiopia also reveal that safe water at households, schools, health institutions and in markets places is 42, 7, 9 and 3%, respectively. This relatively low level of access to safe water is at risk of deteriorating further because the survey also reveals that more than 35% of the water supply schemes are non-functional and 59% of the schemes even cannot cover their operation and maintenance costs. On the other hand the regional Water and Energy Bureau conducted an inventory in 2010 on the water supply schemes in the entire SNNPRS region. Table1 below shows results from the inventory process. As we can see from the table 1 considerable percentage of hand pumps are non functional, hence a new strategy is obviously necessary.

The main reasons for this non functionality rate are

- inadequate operation and maintenance skills and knowledge at the water scheme committees and Woreda levels
- poor access to spare parts
- water committee's do not have legal powers hence cannot enforce laws and regulations
- some of the technologies used are inappropriate for the existing scenario and
- low sense of ownership
- there is no framework to foster preventive maintenance of the schemes.

[3] Alaba, Shashego, Misrak Badewacho, Kedida Gamela, Demboya and Boloso Sore Woredas in Southern Nations Nationalities Peoples Regional State (SNNPRS) of Ethiopia

Table 1. Assessment report on pumps in SNNPRS, 2010		
Scheme Type	**Functional**	**Non-Functional**
Hand dug well fitted with hand pumps	959	488
	66.3%	33.7%
Shallow wells fitted with hand pump	1936	796
	70.9%	29.1%
Bore holes (Submersible pumps)	419	146
	74.2 %	25.8 %

As a consequence schemes are left to fail before repairs are undertaken. The survey also shows that even repairs are not done promptly; on average it takes 1 and 3 months to receive services from the Woreda and Regions technical staff, respectively whenever a request is made. This denies communities access to safe water because they have to resort to poor quality pond water that exposes them to a number of water borne diseases.

After pinpointing the above problems, SNV south portfolio Ethiopia together with Water and Energy Bureau of SNNPRS organized a workshop at Arbaminch town, southern part of Ethiopia, aimed at the selection of suitable technologies for the rural areas of the region. In this workshop, stakeholders from zonal,woreda, universities, TVET colleges, community WASHCOs and spare part suppliers participated in the selection process. Then after it is believed that POM guide line need to be developed to solve simple and technical problems of pumps and generators. SNV together with regional Water and Energy Bureau has organized and financed the development of POM guideline. A team of senior staff members from different organizations namely: SNV; Water and Energy Bureau of (regional, zones and woredas); Hawassa University and Hawassa TVET college were involved in the technical workshop. The team was divided into two groups and each group worked on a selected technology independently and refined jointly. Finally the reports of the two groups were critically evaluated and then edited. The same document was presented to higher officials of SNNPRS Water and Energy bureau, got an appreciation and green light to continue.

Then the developed POM manual got shared to officials from different zones in the region to collect comments that are critical in the implementation of the manual and also the draft document was distributed to the officials both in hard and soft copy, so that they can intern distribute it to the woredas and kebeles near by them.

Translation of the guideline in to local language (Amharic) was one of the challenging tasks to bring technical stuffs in to local language. In the translation process four experts, who participated in the document preparation got involved. This group translates and segregates the document in to four discrete documents Hand pumps, Surface Pumps, Submersible pumps and Engines and Alternators. Training of trainers on preventive operation and maintenance was conducted for technicians from zone and woredas on the manual at Hawassa city.

When we talk about operation and maintenance, it is clear that there is replacement of worn out parts. To replace these parts we need to have genuine spare parts. In this woreda, the problem of supplying spare parts for rural water supply facilities such as hand pumps has been solved by the spare part outlet shop which is available at Durame town by the name Kassa Building Materials Shop. The shop was supported by Japan International Cooperation Agency, JICA, under the project called Water Sector Capacity Development Project (WAS-CAP), by providing a seed spare part for the first time then the shop restock spare parts from the sellings.

Awareness creation workshop at Durame town

Implementation of POM in Kedida Gamela started in August 2011 with support from SNV, regional water and energy bureau and Hawassa University. This process started with awareness creation/intoructory meeting that was conducted from May 12 to 15 2012 at Durame town. The water schemes where POM has to be practiced were jointly selected by the woreda, SNV, Water bureau and the university. Hawassa University is the Local Capacity Builder selected for the schemes. The entire scheme WASHCO members

and woreda WASH team (woreda administrator, head of water, health, education and finance offices) have participated in the workshop. The Woreda Water office experts and technicians have also attended the workshop. The regional Water and Energy Bureau experts have participated as trainers in the workshop together with the SNV WASH advisors. In this workshop, mmore than 13 woreda staff members and 30 care takers are trained in the woreda (district) on scheme inspection, servicing, monitoring and maintenance of hand pumps. They now have the necessary capacity to implement POM in their respective levels. About 13 WASHCO members were trained in scheme administration, and financial management from each woreda. Financial management, transparency, and accountability of WASHCOs.

The following agenda were addressed in the training:

1. Acquaintance on WASH strategy of the country
2. Responsibility of WASHCO members
3. Concepts of sanitation and hygiene
4. Operation and maintenance concepts specially preventive maintenance
5. Acquaintance how to handle public money collected from the community

Different authors addressed on the sustainability of rural water supply schemes in the past, Peter A. Harvey, and Robert A. Reed (2004) presented an overview of the key factors that affect sustainability.
This paper presents the POM approach in the reduction of non functionality of rural water supply schemes.

What is changed after the intervention

Before the introduction of Preventive Operation Maintenance scheme caretakers do not have any technical competence to tackle minor problems, on the other hand, due to the lack of preventive maintenance concept, minor problems often grew into bigger and expensive ones. When problems were reported the woreda technician would first go to identify the problem. If the problem is beyond the technician's skill the request is made to zone or region for technical support, delaying repairs sometimes up to 6 months especially for motorized schemes. In this time, the water services received by users were affected by the long distances they may have to go to other sources, and also the quality and quantity water would also be reduced.

But now thanks to SNV and other stakeholders involved in POM, the care takers have the skills and knowledge of identifying the problem and carry out simple maintenance. If problem is beyond their capacity they know what to do, just contact the woreda technicians for their support on time. Woreda technicians are capable to handle even more complex maintenances like motorized schemes.

The other considerable change is that, regional water bureau has worked magnificently on legalization of WASHCOs. Regulation No 102/2012 is the result of the effort made by the bureau. Regulation No 102/2012 is Rural Potable Water and Sanitation Associations Establishment Regulation signed by the Chief-executive of the Southern Nations, Nationalities and Peoples Regional State is underway to help on the committees' legal status. WASHCOs are now able to open bank accounts and enforce their scheme bylaws. Endorsement of the POM guideline as program document by the regional water and energy bureau enabled the region to enforce POM implementation in other parts of the region.

Results after the intervention

This case study focuses on the ongoing process and some of the results of applying POM approach in one of SNV woreda, Kedida Gamella. The approach brings a remarkable mind shift of the maintenance concept from being curative to preventive. Other interesting findings of this approach are:

Non functionality rate of rural water supply schemes in the woreda gets considerably reduced (nearly by 32.6%), before the implementation of POM guideline the non functionality was 59.2% but now thanks to POM the non functionality gets reduced to 26.5%. Note that Figure 2 above shows that non functionality of all schemes including motorized scheme.

Monitoring and evaluation

Monitoring and evaluation (M&E) is a management tool to measure and evaluate the implementation of preventive operation and maintenance concept. Monitoring and evaluation has been conducted on six water supply schemes that are found in the woreda, namely, Bezena Binara (layegna Totanke), Kerchicho Gerba-

3, Kerchicho Gerba-1, Azedebo (doqe), Jore (zone 14), Abonsa (menged dar). Table 2 below summarizes the results after the intervention.

Table 2. Monitoring and evaluation

Sr. No	Name of the scheme	Before	After
1	Bezena Binara (layegna Totanke)	Water tariff was 2ETB per month There was no any kind of contribution Awareness of POM was poor Women participation was poor Washco at kebele level was no established.	The tariff adjusted to 3ETB per month The community contributed 30ETB per household Awareness created on POM Fencing the scheme Washco at kebele level established.
2	Kerchicho Gerba-3	Water tariff was 2ETB per month There was no any kind of contribution Awareness of POM was poor Women participation was poor Washco at kebele level was no established There was no any formal report to Water and Energy Bureau about the scheme. There was no annual action plan The total number of water users was no known	The tariff adjusted to 3ETB per month The community planed to contribute Awareness created on POM Fencing the scheme Washco at kebele level established Formal reporting about the scheme to Water and Energy Bureau is on track Women participation increased Sanitation and hygiene of the community increased Annual action plan prepared The total number of water users identified
3	Kerchicho Gerba-1	Water tariff was 2ETB per month There was no any kind of contribution Awareness of POM was poor Women participation was poor Washco at kebele level was no established .	The tariff adjusted to 3ETB per month The community planed to contribute Awareness created on POM Fencing the scheme Washco at kebele level established.
4	Azedebo [doqe]	There was no any kind of contribution The fence was poor awareness of POM was poor Women participation was poor Washco at kebele level was no established .	The community contribute 5 ETB per household Awareness created on POM Fencing the scheme Washco at kebele level established
5	Jore [zone 14]	There was no any kind of contribution The fence was poor Awareness of POM was poor Women participation was poor Washco at kebele level was no established.	The community planned to contribute 5 ETB per household in 2005. Awareness created on POM Fencing the scheme Washco at kebele level established .
6	Abonsa [menged dar]	There was no any kind of contribution The fence was poor Awareness of POM was poor Women participation was poor Washco at kebele level was no established .	The community contribute 5 ETB per household. Awareness created on POM Fencing the scheme Washco at kebele level established.

Conclusions and recommendations

The POM approach really brings a significant change for the technical skills of woreda water office technicians, caretakers and WASHCOs through practical training. The approach addresses not only the hardware part but also on the soft components like, awareness creation with regard to cost sharing concept towards the sustainability of the schemes. In this regard, WASHCOs are empowered to improve the management of the water system and also mobilize the community to take responsibility of operation, maintenance and management.

Water schemes now run for longer period of time without breakdowns. When problems do occur they are identified quickly at scheme level by operators whilst undertaking POM activities which makes it easier to arrange repairs in shorter period of time, reducing health risks arising from the use of alternative water sources and saves time for women and children for other productive purposes.

As it is stated, implementation of POM reduces the non functionality drastically. From this we can conclude that POM is one of the strategy to substantially reduce the non functionality rate of rural water supply schemes, this is because POM is cost effective and knowledge required to perform POM is low as compared to curative type of maintenance. Therefore for poor countries like Ethiopia POM plays a

significant role in the reduction of non functionality, this intern contributes its part to the achievement of the growth and transformation plan of the government.

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