



Can Communities Manage Complex Technologies?

Learning and Communications in WASH in Amhara

Introduction

The Harbu area is known as one of the water scarce areas of the Amhara Region described as semi-arid. There are no alternative sources such as springs and shallow wells. Society Rehabilitation Development Fund (SRDF), a former governmental agency, in response to Kule community's request and the obvious need for an improved water scheme, the implementation of a borehole equipped with a diesel pump planned and developed in 2000.

The improved water supply system comprises a borehole as a source, a diesel pump, a rising main, 40m³-capacity reservoirs, three water fountains and a separate water fountain for Kule Elementary School. During the onsite visit, the components of this system were observed to be properly protected and cared for by the beneficiaries evidenced by the fencing of the source area and the protective measures on the water faucet areas in order to protect them from any external damage. Although community participation at the onset of the planning and implementation of the borehole water scheme at Kule was limited and the borehole technology is complex, the Kule community realized the absolute necessity of the scheme, established a community institutional management system and still remains motivated to maintain and improve their scheme.

This improved borehole scheme at Kule showcases how water scarcity strongly influences a community's motivation towards effectively managing and maintaining improved water supply projects even if community participation was limited during scheme implementation. Wayzero Mekedes with her neighbours' explains,

"We used to use water without any treatment from a stream called Dico River as a source...The water from the stream was turbid and did not have a pleasant taste. It took us one hour to fetch water from the stream, which is about 2km from our locality."



Water point connected to a reservoir in the elementary school of Kule, Harbu, N Wolo
 (Photo by: Teshale T., 2011)

The story of Kule comes from a project on learning and communication in WaSH in the Amhara Region that aims to improve the documentation of different issues of WASH in the Amhara Region. The School of Civil and Water Resources Engineering at the Institute of Technology (IoT) of Bahir Dar University (BDU) with support from WaterAid Ethiopia has conducted research on community participation, technology, implementation, operation and maintenance, monitoring and evaluation, sustainability and impact of WASH projects in Amhara Region. The research was conducted at 32 schemes located in different *woredas* in the Amhara Region, but this story is about a single village, Kule.

This briefing note was extracted from the main research that will soon be available at www.wateraidethiopia.org and <http://www.bdu.edu.et>.

Background

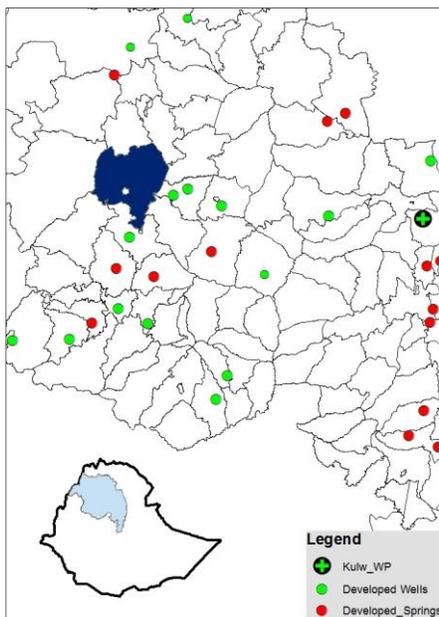
In rural areas, it is a common practice for communities to participate at each level of a water supply provision project through a contribution of cash or in kind for the construction of the scheme, and that they shall operate and maintain their own water supply scheme. To fulfil this requirement, simple technologies that can easily be

managed by the communities are recommended to be introduced because of limited financial and human resource capacities of government or other implementers to reach the entire rural population scattered across rural Ethiopia. By making the technology simple, communities can keep their schemes running without waiting the support from implementers.

As Carter (2009) described, every community and every water point is different. Therefore, it is difficult to put general principles that can work for all communities. Here, we have presented a story about a borehole water source scheme, which is technologically complex and was implemented with limited initial contribution from the community but currently has strong community-level institution and motivation to maintain and improve the system.



Diesel motor that power the pump in the borehole of Kule, Harbu, N Wolo (Photo by: Teshale T, 2011)



Location map of water points monitored in this study (Map by: Seifu A., 2011)

Methodology

Kule WaSH scheme is one of the developed water supply schemes selected for this study after discussing options with North Wollo Zonal and Harbu *Woreda* Water Resources Development offices. Two project team members from the School of Civil and Water Resources Engineering were then able to collect valid information and data concerning the WaSH scheme by using an organized checklist concerning various aspects of the scheme. Structured interviews were conducted with a few beneficiaries of the scheme, the district WASH committee and *Woreda* Water Resource Development office members. The beneficiary interview covered topics on water use practices, participation on planning and management, and sanitation practices. The use and maintenance policies, management strategies and funding plans for the scheme were elicited from the interview responses and follow up with the scheme's implementers. On site observations of the scheme were gathered based on a prepared checklist. In order to substantiate the observations, photographs were taken to document the various components of the scheme. Various forms of data were compiled and analyzed for this report and other documentation intended for this project.

Key Findings

Description of the Community: Kule locality and its surrounding is known for its water scarcity and absence of alternative water sources, such as springs and streams. The Kule scheme serves 2,500 households (HH) consisting of approximately 4000 beneficiaries. The inhabitants of Kule locality are farmers that practices crop-livestock mixed farming systems, and most of them are Muslims. Selling farming products, like that of most Amhara farmers, is a common income source for them. However, we noticed that most, not all, have at least one family member living in Saudi Arabia or other Middle Eastern country sending money back to their families in Ethiopia. This remittance is another important source of income for the Kule community. This shows some households in the community have such source as an income and are capable of paying their expense for water.

Before the scheme: Another reason for sustainability of this scheme is the bad situation before the scheme. In addition to the long distance and extended time required to fetch water from the previous unimproved water source, the spread of water-borne illnesses as a consequence of poor water quality were debilitating and caused household livelihood challenges. Adults were unable to work and children died.

Wro. Mekdess, and her neighbours described the before intolerable situation as follows:

We used stream water...and there was endemic disease like "kolera" (local name for diarrhea). "Kolera" killed many children and the adults were not healthy. The water from the stream was turbid. In addition, sand was being extracted upstream of our source for local construction activities, and this extraction caused severe turbidity and negatively affected the water quality. The water dries out during the dry season. Now (after the implementation of the borehole), we are able to save time and are healthy -- no more "Kolera"-- because of the clean water from the new scheme.



Wro Mekdes and her neighbours telling a story about Kule water supply system in Harbu, N. Wolo (Photo by: Teshale T. 2011)

Community participation: Community participation during the implementation of the improved scheme was limited. The borehole drilling was done by a private contractor from China as a turnkey project, which involves both the design and construction. All construction costs except the digging of the trenches for burying the pipeline and the water fountains were paid by the project implementer, SRDF. However, the scheme was constructed upon the request of the community. Although the community was not involved during the construction period, they were later made to establish a WASH committee with six members (chair person, secretary, cashier, store and two other members) and one additional trained pump operator. All of the current seven WASH committee members are male but one woman was a member during the establishment of the committee through the assistance of the implementer. However, she is now living in a Middle Eastern country. The WASH committee is responsible for managing the scheme, organizing the beneficiaries and controlling the scheme finances, all according to their community-established rules and regulations. This shows that in water scarce areas, where there is lack of enough alternative sources communities and committees commit themselves to stand for their newly constructed schemes.

Operation: The other feasible reason for the sustainability is the strategy of operation and

maintenance implemented at Kule. For each of the water fountains, there is one guard who is responsible for monitoring and recording household consumption rates and making the fountain accessible at the specified time period. In Kule's case opening hours are 6:00 to 8:30AM in the morning and 4:00 to 6:00PM in the evening. In addition, the guard has to protect and clean the surrounding of the fountain. In return, he receives gets 70 Birr per month. Further more, two pump house guards are hired each for 150 Birr per month in order to protect the pump house and water source. A motor (pump) operator receives a monthly salary of 200ETB while the school guard receives 50 ETB for protecting the reservoir located in the school compound.

All of the scheme's maintenance and operation costs are covered by the beneficiaries in the form of monthly payments i.e. assuming one jerry-can per household per day, 6 birr/month/HH during 2010 and 7 birr/month/HH during 2011. This works out to 20 cents per day and 23 cents per jerry-can in 2010 and 2011, respectively. According to the regulations, a household will pay 30 cents for an additional jerry-can. An average household consumes 3 jerry-can (75Liters) per day. The monthly payment is collected every six months using cash payment voucher prepared by the committee. The committee is saving this collected money in Amhara Saving and Credit Institution (ASCI). The community currently has 37,000ETB in their account.

Maintenance: When the scheme is damaged during operation, the pump operator from the community attempts any maintenance within his capability. When the problem is beyond their capacity, the WaSH committee hires an artisan. Damage is rather frequent, every three months. Since its development, the scheme has stopped providing full service for only 30 days due to damage to the motor. Spare parts for maintenance continue to challenge the community because they are available from Woldiya town, approximately 30km away or Dessie town, 90km away. Or, if the particular spare parts are in stock, the *Woreda* Water Resources Development office may provide them to the maintenance committee. The committee at Kule is highly committed to sustaining their water scheme since they are willing to travel to these distant towns and purchase the necessary parts.

In addition to such commitment, the reasonable tariff from each of the households contributes significantly to the sustainability of the scheme. The community even sets penalties for those water users who do not pay the water tariff on time. Those who fail to pay on time cannot get water from the scheme until they pay. However, some of the beneficiaries have complained about the affordability of the tariffs.

When we compare the water tariff of Bahir Dar city to Kule's tariff, we found that Bahir Dar city water tariff is 7.25 Ethiopian cents for 25 liters while Kule's tariff is 20 cents per 25 liters. Even if the tariff is higher for Kule water users, the financing mechanism has enhanced the sustainability of the scheme. For example, fuel for the diesel pump costs the community approximately 7,000 ETB per month, and the fuel can be purchased from nearby Mersa city.

Future plan and the challenge: In an effort to improve the pumping mechanism and minimize expenses, the committee is planning to change the current diesel powered an electric powered pump. This modification will require an expensive initial investment cost of 170,000ETB. This high cost is necessary in order to reduce the future monthly expenses of the system and the monthly household payments so that the system will be more affordable. The community's major challenge now is accruing the high pump-modification cost.

Recommendations

1. **Develop a reliable source:** One of the major factors for the sustainability at Kule is the strong reliability of the source. This increases the community's trust of the scheme and increases in part their willingness to pay for its operation and maintenance.
2. **Not always simple technology:** It is assumed that only simple technologies are more easily managed and maintained by a community; however the rate of failure is high for technologies, such as hand

pumps, which are assumed to be the simplest water supply technology available. The water supply scheme at Kule locality has provided solid proof that a community can manage complex technologies, such as a diesel pump and borehole in water scarce and no alternative source areas.

3. **Support modification of technologies:** Government and non-governmental organizations are more focused on improving the coverage of water supply. However, due attention is necessary to address the issues that improve sustainability, such as introducing new or modifying previous technologies. The Kule community, as a good example, has expressed serious interest in exchanging the diesel pump for an electric-operated one.
4. **Establish strong financing:** The other factor that increases the sustainability of the scheme in Kule locality is the strong financing mechanism generated by the water committee and the community. Kule provides a good example of how water scarce areas that have limited alternative water supply sources often have better community-based management systems.
5. **Increasing the income:** Increasing the income of a household improves the capacity to pay for water services. In Kule, the remittance has a factor to pay the 7 birr per month for operation and maintenance from each household. With the provision of water, consideration how to increase household income is advisable.

Reference:

Carter, R.C. (2009) Operation and maintenance of rural water supplies: Rural Water Supply network Perspectives no 2

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