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Recent History Provides Sustainable African Water Quality Project Insight

by Rochelle H. Holm

Abstract

Small-scale projects to provide clean drinking water undertaken in the developing world can contribute to significantly improving the livelihood of rural communities. There has been a historical tendency to poorly plan such projects leading to an unsustainable future. Recent history indicates three simple steps to ensuring successful and enduring clean water projects. First, identification of need by the indigenous community provides ownership in the project. Second, a partnership between key individuals in the indigenous community with the donor provides for ambassadors on both sides of the project. Finally, an exit strategy by the donors for the indigenous communities ensures local sustainability for the future. The study site is the village of Geisha in northern Malawi, Africa. Sustainable implementation approaches are discussed in this case study as well as the various lessons learned. Improved project processes ensure sustainable small-scale water quality projects by donor organizations in developing countries.

Introduction

Malawi lies in Africa's Great Rift Valley. Its western border is defined by Lake Malawi, the third largest lake in Africa. Over 80% of Malawians live in rural areas and 90% of the labor force is associated with agriculture. The estimated 2010 gross domestic product (GDP) for Malawi is \$900. In 2004, more than half of the population was reported to live below the poverty line by the United States of America Central Intelligence Agency (2011).

The northern region of Malawi is controlled by patriarchal customs. Social impacts and target groups must be considered for effectively providing clean water sources to Malawi, with 45% of its population under the age of 14, and a 2011 population growth rate of 2.763% (United States of America Central Intelligence Agency 2011). Diarrheal diseases from unsafe drinking water are one of the top causes of mortality in children under age 5 (World

Health Organization 2011). Without sufficient and sustainable supplies of clean water, these historical challenges will continue to threaten Malawi's ability to overcome the devastating impact of diarrheal diseases on its population. Therefore, Malawi remains highly dependent on outside assistance and influence to reduce or eliminate the threat posed by unsafe drinking water in the future (Mkandawire 2002).

In response to this need, several organizations have committed resources toward improving the lives of Malawians through developing clean and sustainable water supplies. Recent history of partnership efforts of such donor organizations, including the National Ground Water Research and Educational Foundation (NGWREF) Developing Nations Fund and West Side Presbyterian Church (West Side), Richland, Washington, and the local community in the village of Geisha, in northern Malawi, Africa are presented. The village of Geisha is densely populated, with about 1000 people living in the area. Local residents rely on groundwater or stream surface water as the primary water sources. In Geisha, water is not treated before use or consumption. Hundreds of shallow latrines are scattered throughout the area of investigation and serve as point sources of fecal and nutrient inputs to the water

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supply. The soil above groundwater acts as a natural filter of downward moving surface water via biodegradation, attenuation, and dilution. However, preferential water flow pathways and high loading of nutrients, including animal waste and chemical fertilizer, can decrease the effectiveness of this natural filtering mechanism. The project itself was small in scale, involving the installation in 2008 of one drilled well in Geisha to be discussed in this paper, and a second drilled well in the nearby village of Kaning'ina. This case study focuses on the project management processes that were employed to provide that the expenditure of financial resources resulted in a sustainable clean drinking water supply for the village of Geisha into the future.

Identify Project Need

A critical first step in sustainable African water quality projects, one that provides the foundation for sustainability, is that the community must identify its need for a clean water supply, and initiate efforts to make it happen. This ensures their ownership in the project and enhances prospects for long-term community support. Projects sited by donor organizations based on their own criteria, in communities that have not demonstrated sufficient leadership and commitment to the project goals, are less likely to provide sustainable benefits. Reverend Levi Nyondo, St. Andrew's Church, Church of Central Africa Presbytery, based in the nearby town of Mzuzu, expressed to members of West Side the extreme need for deep-drilled wells during a scoping trip to Malawi in March 2007. The scoping trip provided West Side an opportunity to investigate the potential for partnership in this area. Scoping trips, although not physically initiating a project, allow relationships to be built between the members of the indigenous community identifying the project need and donor organizations.

Rev. Nyondo provided essential indigenous leadership. He was able to identify potential clean water projects with both an extreme need and a community desire. In many villages of Malawi, the nearest source of water was a turbid pond, used by both animals and people, or an improperly sealed well. In this area of Malawi, it is common for women and young girls to be responsible for bringing water from up to 1 km away and down a steep ravine for domestic use and consumption (Figure 1).

In August 2007, West Side returned and funded one drilled water well in the village of Mosanto. In 2008, Rev. Nyondo and the village of Geisha expressed the desire for a second clean water partnership project to be located near the village school. The value of placing a well for community water near a school is that no single individual will own the well, limiting the potential for access restrictions based on religious, political, or other affiliations. Women and children will benefit most significantly from the introduction of clean water into a community. However, due to Malawian patriarchal social structure, the village men have the authority to decide the need for a clean water source. Because of this, it is important for men and women



Figure 1. Typical rural Malawian drinking water source, 2007.

to be considered in the community identification of need and well placement.

Partnership

In the second step of sustainable African water quality projects, a partnership between the donor and key individuals in the indigenous community provides for ambassadors in both interest groups of the project. In the village of Geisha, social impacts and target groups were addressed by collaborating with Rev. Nyondo. The NGWREF and West Side, as stakeholders and project sponsors, were then able to collaborate with Rev. Nyondo. Rev. Nyondo was instrumental in gaining indigenous community support and organizing the community logistics to provide resources, as they were able. Village-based project logistics included forming a well committee of both men and women community members, providing food and housing for the drilling team during fieldwork, and coordinating the supply of community-provided raw materials such as sand and gravel. The NGWREF and West Side's primary responsibilities were planning and execution of technical water well drilling, and overall monitoring and control of project milestones and funding. The NGWREF and West Side were also responsible for (1) ensuring on site support from a subject matter expert in African water quality projects, (2) fundraising stateside, and (3) project oversight. After the 2007 well funded by West Side, a second team was formed in 2008 to implement installation of the well in Geisha (Figure 2). Although only five individuals traveled to Geisha for the 2008 fieldwork, a much larger and essential stateside ambassador team of financial donors and technical experts supported this project. The stateside team provided technical input on siting the water well, through review of satellite imagery, and consideration of topography, geology, and groundwater flow direction.

The combination of key indigenous community individuals through Rev. Nyondo and a local water well consultant provided the best advice on the placement of



Figure 2. Well drilling, Geisha, August 2008.

the Geisha well based on geologic, political, and/or religious considerations. This should not ever be the donor's role. If the best yielding Malawian well is not used due to geographic, political, or religious considerations, the project fails. Mr. Lucky Penumlungu, a Malawian water well consultant based in the capital Lilongwe, was contracted to coordinate the well drilling and pump installation in Malawi. In many developing countries while such subject matter expertise is not available in the indigenous community, it is available on a larger regional scale. Mr. Penumlungu brought to the project 35 years of drilling experience in Malawi, technical skills the village of Geisha or Rev. Nyondo did not have. In addition, he had consulting experience with the Malawian government and international organizations, including World Vision, and Save the Children. The NGWREF and West Side were able to initiate the services of Mr. Penumlungu as a key partner in this model. By utilizing his knowledge of local skills, language, culture, and geology, field condition variables were minimized and project success maximized. The well in Geisha was advanced using air-rotary drilling methods to approximately 55 m of depth. The air-rotary drilling rig was based in the capital Lilongwe. The village of Geisha contributed 3 tons of sand, 1 ton of gravel, and 2500 clay bricks to the project. Other well installation materials were secured by Mr. Penumlungu.

One of the often hidden benefits of small-scale water quality projects is creating a group of donor ambassadors

to continually support projects for the future. This helps to generate long-term relationships of trust between the indigenous community and donor organizations. Trust takes many forms, each of which is needed for locally sustainable clean drinking water projects. This in turn makes it feasible to use several small teams that can be rotated in and out of service, and from project to project, with equal effectiveness so that no single donor individual gets overburdened. This case study and recent history indicate a team of ambassadors also greatly increases the efficiency of projects, as they bring a proven history of knowledge, planning, and implementation to the project, rather than the historical tendency of taking the failed shotgun approach of too many unprepared donors.

Deliberate Project Closure

The final step in sustainable African water quality projects is implementing a simple, effective, exit strategy. Funding wells in Africa takes more than a check-writing exercise by the donor. Common failed approaches by donor teams historically neglect cultural barriers, and attempt to walk in and try to solve the water supply problems of an African village by simply drilling a well and then returning home. The village of Geisha saw Rev. Nyondo as the initiator in acquiring the water well and the NGWREF and West Side team as Rev. Nyondo's partners to meeting the goal of providing clean water. This partnership model provides for greater ownership in the well by the indigenous community as Rev. Nyondo will be among the Geisha community long after the donor returns home (Figure 3). Utilizing the knowledge and forming a partnership with a Malawian well consultant enabled Rev. Nyondo to contact Mr. Penumlungu directly in the future for questions or concerns.

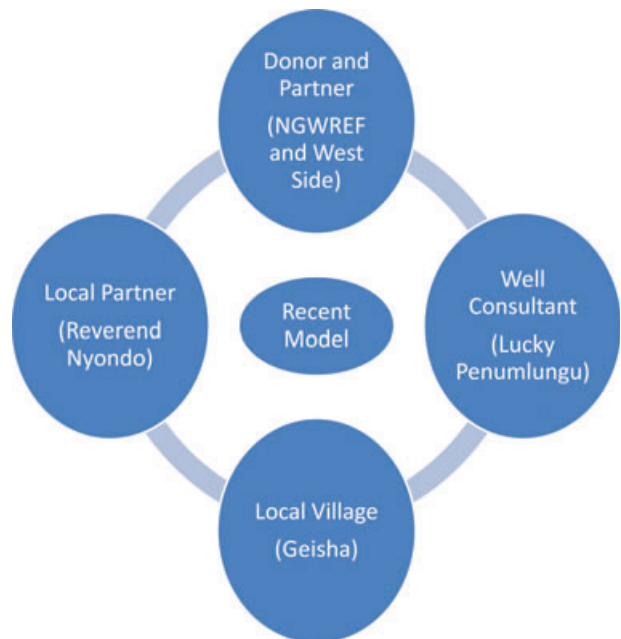


Figure 3. African water quality partnership model.

Another essential exit strategy component is an effective plan for maintenance and overall sanitation. A village well committee, of men and women, was formed and members observed the installation of the well components in Geisha. In this illiterate area, visual learning is the culturally appropriate communication medium. Seeing as the women are affected the most by the supply of clean drinking water, the women consequently were the most attentive to these maintenance lessons. Sanitation and maintenance training was also provided in the local language as part of the exit strategy.

Conclusion

There has been a historical tendency to poorly plan small-scale African water quality projects by donor organizations leading to an unsustainable future water supply. If a well pump from a small-scale clean drinking water project fails 1 day after the donor leaves, and the village is not provided maintenance training in its native language, or parts are not available, the project has failed. In addition, a village must be enabled to utilize local people, such as the roles Mr. Penumlungu and Rev. Nyondo fulfilled in this Geisha well project. At the end of this project, the community of Geisha had both a sense of ownership of the water well and a functional well.

The availability of clean water often provides a substantial increase in a community's quality of life, and yet simple, small-scale, water supply systems can provide

this resource effectively in these environments. In that regard, too many ill-managed and ill-planned projects have not provided sustainable clean water to communities that otherwise would have been easily served with a much simpler, village-maintained, system. Project management processes employed as part of small-scale clean drinking water supply projects including local identification of need, partnerships, and an exit strategy result in a sustainable project.

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