

# **Water and Health in Limpopo (WHIL): Engaging Communities through Water, Health and Leadership Education in Limpopo, South Africa**

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## **Abstract**

*The ongoing Water and Health in Limpopo (WHIL) Project, in partnership with the University of Venda, is working to assess and implement a means to enhance the quantity and quality of water for the rural South African communities of Tshapasha and Tshibvumo. The 2010 WHIL team employed a Slow-Sand Filter and a Community Engagement component, with the objectives of installing improved water-filtration technology and educating the community about sanitation in order to augment community involvement in this infrastructure. During the eight weeks spent in the villages, the team encountered considerable impediments to the construction of the filter due to political discord. However, the project's initiatives—in the form of a Clean Water Camp in primary schools, a message board and a public Water Fair—demonstrated the value of community engagement in bypassing political issues, encouraging autonomous initiative in students and ultimately fostering a healthier partnership between the WHIL team and the community members.*

## **Introduction**

The Water and Health in Limpopo (WHIL) project began in May 2008, collaborating with the University of Venda (UNIVEN) to address the Limpopo community leaders' number one concern - poor access to water clean, potable water (Annegarn, H.J., Swap, R.J., Walther, S.C., n.d.). Statistics from 2002, when the idea for the WHIL project was first conceived, showed that the Limpopo Province is one of South Africa's poorest regions. Over 60% of the population lives below the poverty line and many are heavily burdened by disease. Nearly 20% of the population is infected with HIV and water-borne diseases are rampant (Annegarn et al., n.d.). Diarrheal disease in Limpopo is second only to HIV as a cause of death, partially due to the 90% of the province's population that lives in rural areas with limited access to potable water and sanitation (Annegarn et al., n.d.).

In order to provide the South African communities of Tshapasha and Tshibvumo with sufficient access to clean water, a group of four fourth year engineering students expanded upon the 40,000 liter water filtration system implemented in 2007 by UVA's Engineering Students Without Borders and their South African partners (Harshfield, Jemec, Makhado, Ramarumo, 2009). The improved slow-sand filter, built in the summer of 2010, was projected to both improve the quality of the drinking water and increase the quantity from about 87,500 to the 175,000 liters per day required to meet basic human needs (Gleick, 1996).

In past years, the WHIL project realized a disconnect between community members and WHIL project leaders, as the people in Tshapasha and Tshibvumo did not have a clear understanding of the project goals and methodology. For this reason, the community engagement part of the project discussed in this paper was founded and implemented during the summer of 2010.

The goal of the project was to educate the villages about health and sanitation issues and create a sense of urgency regarding diarrheal disease. Ultimately, the team wanted to foster dialogue between the WHIL project and the community, prompting discussion about the topic as well as promoting acceptance of and participation in the WHIL project's endeavors.

This paper will concentrate on the community engagement component of the WHIL project. Described above are the initial project goals prior to interacting with the communities. However because of the

collaborative nature of the project, both with the students at UNIVEN and the community members, the objectives and methodology were constantly adapted based on feedback and perceived attitudes.

## **Methodology**

With the goal of community engagement in mind, the team settled on several strategies to approach this challenge from different angles. First, the team hoped to reach out to the schools in the two villages—namely Tshapasha Primary School in Tshapasha and Mboneni Primary School in Tshibvumo. Through previous connections made by past WHIL students, meetings were set up with teachers and principals from both schools. At these meetings, a proposal was discussed alongside several revisions and reservations felt by the community partners. Taking this feedback into account, the community engagement strategy was divided into three main parts: the Clean Water Camp (CWC), Clean Water Fair and message boards. To obtain feedback about all of these initiatives and understand the communities perception of WHIL, two focus group tests were conducted—one in each village—comprised of adult family members of students in the Clean Water Camp.

### *Clean Water Camp (CWC)*

The keystone of the team's strategy was the plan to work with local youth to spread the word about the importance of clean water practices. It was hoped that working with the youth would foster an environment that allows for open communication and encourages participation. Participation is part of a critical thinking, problem solving and experiential approach to learning. Through youth-initiated action, young people learn how to collaborate with one another and develop problem-solving skills. They gain their own understanding of citizenship and develop roles for themselves as part of a democratic society, which subsequently promotes a conscious sense of responsibility and stewardship to the community (Friedmann, 1998, p. 9-17).

Before arriving in South Africa, the anticipation was to be able to work with these students during the course of a typical school day. However, because of the World Cup, school was not in session during the designated times for the project. At the initial meeting with school officials the team reformatted its plans to offer a Clean Water Camp. Although this camp would not be

able to reach every student in the two schools, the team was able to work with a core group of twenty from each school, all selected by their teachers. This group included students age 6 to 13 years who were leaders in the classroom, because we believed that student leaders were also most likely to take what they learned from the camp and effectively disseminate it amongst their peers.

After two groups of twenty students were selected by their teachers, the UVA-UNIVEN teams scheduled five two-hour camp sessions for each group. These sessions were conducted over a period of two weeks. For each session, a lesson plan was created which included a variety of activities and a snack time. The purpose of the snack time was to allow students a break, but more importantly to allow them to wash their hands, cementing an important practice stressed in the sessions. The activities varied in nature from group work to individual work.

### *Water Fair*

The Water Fair was an event held at the culmination of the Clean Water Camp. The goal of the event was to present the work of the students from the last two weeks to an audience including village chiefs and officials, school faculty and administrators, parents and community members (Cunningham, 2008). At the Fair, groups of students presented skits they had prepared featuring lessons learned during the Camp, as well as orations that they memorized. In one skit, students acted out a scene in which a teacher was explaining to her students the dangers of unclean water collection. Students discussed some solutions to the obstacles of clean water collection in an oration. Some of the content was in English and some in their local language, depending on the language ability of the individual students.

After the performance portion of the Fair, a meal was served to all in attendance. The goal was to create a sense of celebration that would reflect the accomplishments and hard work of the students and breed goodwill for the WHIL project. A microscope was set up so that community members could see for themselves some evidence of the dangers the students discussed in their performances. At the end of the

student presentations, members of the WHIL team fielded questions from the audience about the project. Many people had questions about the operation of the slow-sand filter, and this gave the team a chance to explain common misconceptions. Feedback was also heard—both positive and negative—from members of the audience.

### *Message Boards*

The idea for the message board originally came from the water project conducted by UVA students in La Gracia, Belize. They constructed two message boards at two village stores that were to be responsible for maintaining the water system. Their board functioned as a way to “create transparency and regular communication with [residents]” (Evans et al., 2010, p. 19). Additionally, “[The message boards were used to] inform [community partners] of daily activities and provide a means for anonymous feedback” (Evans et al., 2010, p. 19).

The Limpopo message boards were similarly built next to the two local schools as a way to protect them from vandalism and ensure that a responsible body of individuals would oversee their use. However, unlike the La Gracia project, the message boards were not to be used by WHIL project members, but rather intended for each village’s water committees as a means to relay facts and information both about the WHIL project and about general health/water related issues in the community. The boards were also constructed to allow community members to post anonymous feedback to the water committees, suggesting improvements to the system and highlighting their personal issues in a non-politicized manner. The team worked with Water Committee volunteers to construct the boards, successfully installing one in the schoolyard of the Primary School before our departure. The second board was planned for the second village, but there was debate about its best location. When field work concluded, the board was complete but had not yet been installed in the community.

## **Results**

### *Political Obstacles with the Slow-Sand Filter*

The construction of the slow-sand filter deviated greatly from its planned timeline due to an onset of unforeseen political obstacles. The stand-in chief in one of the villages, who traditionally supported WHIL’s efforts, was replaced by his brother, the true chief, who had not lived in the village for an extended period of time. Because of this, the villagers accepted the stand-in chief as their leader rather than his brother because he was his father’s choice. Thus, WHIL members were caught in the middle of a political debate and were unsure how to best interact with the leaders without offending them. To complicate matters further, the filter that was to be revised had been built during the previous summer in the stand-in chief’s yard (as a way to protect it from vandals and ensure responsible ownership). This upset the true chief, spurring tension between WHIL and the village. Furthermore, the water committee in this village refused to meet with the rightful chief, making progress towards constructing the filter even more difficult.

Unfortunately, these complications slowed the start of the slow-sand filter by three weeks, but rendered community engagement all the more vital. The support of those in the community swayed the chief to allow the construction of the slow-sand filter to proceed.

### *Clean Water Camp (CWC)*

Initially, the goal of the Clean Water Camp was to educate the student leaders in the two villages about health and sanitation issues to prompt participation in the WHIL project. Through activities like the “Clear Water is not Always Clean Water” game, the learners demonstrated their growing knowledge of sanitation and healthy water habits (Firehock, 1995, 52-53). During focus groups conducted with the children’s parents, participants responded that the lessons were influencing students’ and family’s hygiene practices in positive ways.

Certain aspects of the CWC curriculum were adjusted to better accommodate the knowledge base students already possessed. For example, the curriculum originally contained a lesson explaining germ theory at length through a microscope demonstration with local stream water. This lesson, however, was condensed as many students in the class were already knowledgeable on the subject due to the 2009 Zimbabwean cholera outbreak. The children had read newspaper articles related to the outbreak and

had viewed pictures of the bacteria printed in the same source. This understanding was demonstrated when students were able to draw accurate pictures of a cholera-like germ during an in-class activity.

In place of the initial germ lesson, a class about water conservation was taught by the UNIVEN partners per request by both community members and other UNIVEN students. This lesson covered an important water-related topic the team had been unaware of prior to the CWC class.

During the focus group tests held to assess the results of the program, one mother explained how her daughter had “begun taking a bucket of water with her when she used the bathroom so she could wash her hands afterward.... [which] she never did before the camp” (Focus group, personal communication, June 17, 2010). Other parents responded similarly saying the camp was “relevant because kids will give encouragement to elders” (Focus group, personal communication, June 17, 2010) or that they were “impressed about teaching washing hands [because] most children don’t wash hands very often. Children can now remind their friends” (Focus group, personal communication, June 17, 2010). The adults’ stories about their children’s changed hygiene practices clarified that educating children is an effective way of spreading information amongst parents and elders.

Additionally, the adults were able to provide critical feedback on the program, suggesting the inclusion of lessons on traffic safety and the extension of the program to adults – ideas that are feasible and legitimate. Based on this feedback, the CWC’s original goals were recalibrated to focus on expanding the curriculum and reaching a greater majority of the children and adults throughout the community. Rather than focusing solely on water and hygiene, it would be beneficial to encourage the individuals to self-assess their needs and thereby help to redefine CWC’s future contributions and the larger WHIL project’s work. One of the student’s brothers commented that he “believed that this camp will help the kids in their career choices in the future and open up many opportunities” (Focus group, personal communication, June 17, 2010). The Clean Water Camp, by addressing the problem of water health, was not only able to target a crucial community need, but also developed leadership and problem-solving skills among the students.

### *Water Fair*

The water fair served as a unifying public event, bringing together parents, elders, teachers, children, water committee members and chiefs as the students presented what they had learned during the CWC. Despite the political issues in one of the villages, the schools provided a welcoming opportunity to connect with the community in a neutral manner. Likewise, the water fair united both political and nonpolitical entities, providing an opportunity to interact with and teach the community as a whole.

The chiefs and water committee members were able to hear what had been taught during the course of the CWC in a forum virtually free of political debate and rivalries. This created a common ground of understanding between WHIL and both traditional and non-traditional leaders. The fair eased tensions between the UVA/UNIVEN representatives and village leaders as the separate forces were reunited in the common goal of providing clean water to the community and the children.

### *Message Board*

The intended use of the message board proved to be a weaker aspect of the engagement project due to its unsustainable nature. The flawed design of this portion of the project resides in the fact that the water committees are a group of individuals brought together by WHIL’s foreign concept of a public interest group. The water committees run the risk of becoming politicized or sedentary, which threatens the success of the “sustainable” water filter system. The problems the water committees face are similar to the potential issues with the water filter itself – the systems run the risk of either becoming the source of political tension or suffering from a lack of accountability.

Although it is unclear whether the message boards will be used directly as part of the WHIL project, as was intended, building the boards proved to be an important bonding activity for the community, schools and water committee members. All those involved voiced their excitement in having been part of the construction of a physical sign of accomplishment. This enthusiasm seemed to stem from communal impatience for tangible results to materialize as a result of the project.

In an effort to ensure that the message board remains active and is constructively used, both the water committees and schools were given permission to utilize the message boards for discussions about the

WHIL project and water issues in the community. Hopefully the water committees will utilize this tool as a means of interaction with the community. But if not, the schools can take advantage of the space and use it to display student artwork and projects created as a part of the clean water curriculum to be implemented.

## Discussion

### *Bypassing Politics by Becoming Equals*

Working in the two villages throughout this project proved to be an educational, effective and politically neutral means of forming strong ties to the community, thus making projects more likely to succeed. This is especially true if researchers enter the classroom as knowledgeable equals rather than condescending instructors. By expelling an authoritarian role from the instructors in this camp setting and adopting a co-learning perspective, one can more easily develop a trusting, personal relationship. Aiding the local people as a donor or philanthropist is neither sustainable nor powerful. A strong synergy between researchers and the community brings about natural incentives, in the form of genuine interest and mutually beneficial results. Both of these goals have presented a challenge for WHIL teams, and development projects in general, to achieve as a result of using extractive research methods.

### *“Making” Sustainability*

By forming projects around the goal of enhancing initiative within the community, ideas become inherently more sustainable as the native people are put in control of their situation. The education program implemented this past summer is not an intrinsically sustainable concept, as it was not based on the area’s natural assets. However, the program is based on the foundations of reciprocal learning and personal development. Even if it only perseveres for a finite number of years, the program has the potential to educate and empower future leaders. Training young minds to question the status quo and take action has infinitely more sustainable power than could ever be unleashed by a group of temporary researchers. According to youth participation researchers Gurstein, Lovato and Ross, “They [youth] have a great deal to teach youth and adults alike about participation, which whole communities will recognize when they begin to perceive their younger citizens as assets and resources—agents of change who bear valuable tools that can illuminate new paths of community development” (Guerstein, Lovato, and Ross, 2003, 249-274).

### *Projects Based on Community Assets*

One of the fundamental challenges WHIL faces is the nature of the project – the slow-sand water filter is being constructed as a solution to a problem not originally conceived by the villages. True, the villagers wanted a larger *quantity* of water, but they were not concerned with the *quality* nearly as much if at all. For many individuals, the filter is not as important as the JoJo tank used to collect the water. For this reason, the community engagement component of the project, which highlighted the need for potable water, was crucial to the project’s sustainability. However, a flaw in this project’s design was the separation of the construction from the engagement. Though the children and community members were motivated to improve the villages’ water quality and sanitation as a result of the engagement endeavors, they were still disconnected from WHIL’s objectives because of their limited ability to actually participate in the core of the project – designing and implementing the filter.

This complex problem, however, could not be resolved simply by letting all those in Tshapasha and Tshibvumo build the filter. Because of the technical nature of the skills required for proper implementation of the filter, it is a challenge even for professionals in this field. This makes the project more difficult than most, as people may be inspired to take steps to improve their situation, but then are immediately exposed to a project that is both complex and foreign.

Understanding the complications of the WHIL project reveals that the most naturally successful projects are those that build upon existing communal assets, whether in the form of knowledge, skills or technology. These organic solutions are more natural, sustainable and empowering as they do not rely on the mindset of other cultures or the skills of those who will only be present in the community for a finite period of time.

### *Limitations of the Project*

WHIL, like many projects requiring a large dedication of time and funds, is limited by its long investment in the current water filter project. Scientific research is not a linear process (from question directly to answer) - it takes multiple attempts, feedback and reflection to understand how to move forward. A true research process requires continuous revamping and redirection with each installment of information because there is no true way to predict what will be encountered. The "six-phase" sand filter implementation plan that WHIL has been dedicated to for the past three years has provided an organization strategy for a complex project. However, it limits the workers' abilities to be responsive to community feedback because of the solidified structure.

Many of the limitations that the construction component of the WHIL project faced could be addressed by better integrating the community engagement efforts with the project as a whole. However, education's effectiveness is also limited when used as a singular tool to facilitate development. Education is a crucial element in community engagement projects as a means to keep residents invested in the outcome. It is impossible to implement successful changes using only education when a host of other resource needs exist. For example, it is difficult to teach children to take initiative and improve the quality of their water when they neither have the resources to educate themselves on the subject nor the funds to invest in their ideas.

### *Benefits to the Community*

Despite these limitations, the WHIL project has demonstrated an ability to reflect on its past actions and take steps to revise those weak points. The slow-sand filter has a strong foundation and significant support from both UVA and UNIVEN students and faculty. Better integration with the community will lead to an improved livelihood for those in Tshapasha and Tshibvumo. The implementation of the filter will be most effective when engineering engagement successfully works towards catalyzing existing knowledge into creative solutions by supplementing it with an engineering expertise.

Furthermore, the educational program developed during the past summer has shown promise in mitigating political obstacles with the slow-sand filter. A healthier partnership with the community and local governments is emerging and will hopefully continue to grow as the educational component of the project becomes more focused on leadership development and community autonomy. By expanding upon the strong ties created in the school system, university and villages, the WHIL can foster a mutually beneficial venture.

## **Biographies**

**Erin Boehmer** is a second year Systems Engineering and Computer Science student interested in the use of software in development work.

**Rachel Smith** is a second year Biomedical Engineering student involved in Engineering Students Without Borders.

**Melina Schoppa** is a second year Foreign Affairs major hoping to pursue graduate study in Public Policy. She is returning to South Africa this March to continue work on the water health curriculum.

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