

# Engineers Without Borders – New York Destination: Kenya

by Matthew Sisul

**E**ngineers Without Borders (EWB) is a national charitable organization based out of Denver, CO. Their mission is, “to improve the quality of life through the implementation of environmentally sustainable, equitable and economical engineering projects while developing internationally responsible engineers and engineering students.” They do this by working with student chapters and partnering with developing communities.

The New York Chapter of Engineers Without Borders (EWB-NY) began early 2004 after Mazda Riazi, with the New York City Department of Environmental Protection (NYCDEP), attended a national EWB conference in Denver. Being from a foreign country himself, Riazi said he knew there was a need for assistance in countries that do not receive enough help from their own governments.

Riazi began hosting meetings trying to promote involvement in the new EWB chapter. Development progressed while prospective members trickled in and out of meetings as the months passed. It was not until the chapter was presented with their first project that things really began to take off.

## The Kenyan Connection

Normally an EWB chapter applies for a project. This project came looking for EWB-NY. As Scott Snelling, the project leader, remembers:

*“On September 21, 2005 the phone in my cubical rang and, as usual I was greeting the caller before the phone had a chance at a second ring. It was Mark Reiner, the project director for Engineers Without Borders-USA calling from the Colorado headquarters. There is an NYC-based NGO (nongovernmental organization) called Mwikali’s Gift looking to*

*do a water project in Kenya,” he said. “I met with them last week and they are open to partnering with an EWB team. Are you guys in New York interested?”*

*At that point my experience with EWB was limited to attending one meeting and, unsuccessfully, volunteering to go to tsunami ravaged southern India to perform a site assessment. I had heard of Kenya and knew it was in Africa, but nothing more. As a mechanical and structural engineer in a structures department my primary role is to work on drawbridges. I had designed hydraulic systems that power the movement of large spans, but these systems used oil, not water as the medium. In summary, I had no qualifications for a Kenyan water project.*

*I told Mark I would try to get a team together and get back to him. I walked over to the desks of my friends and co-workers at Parsons Brinckerhoff -- Matt Barber, Preston Vineyard, and Matt Sisul. Within minutes I knew we would have a team of at least four.”*

## Mwikali’s Gift

Usalama is a settlement with a population of approximately 1,500. It was formed in the early 1990s when the Kenyan government evicted thousands of farmers and villagers from their land in order to create a new game reserve. The displaced citizens were given land at several sites throughout Kenya, and Usalama, located about halfway between Kenya’s capital of Nairobi and its chief port, Mombassa, is one such site.

Usalama is located on a patch of especially arid land in an area known for its dry climate. There is essentially no potable groundwater, and what water can be found in the many wells the villagers have dug is often too salty for irrigation or for livestock. In the rainy sea-



Posing with village citizens during the site assessment visit for the Usalama Water Project are (left-to-right, back row:) Scott Snelling (9th) EWB-NY, Peter Riechers, EWB-San Francisco (11th); (front row:) Matt Sisul, EWB-NY (4th), and Karen Brodsky of Mwikali’s Gift (6th). Jeremiah Kiscove (3rd in front) is the village leader.

Photo courtesy of EWB-NY

sons (usually two per year), the villagers make use of temporary surface water flows. However, the surface water is often contaminated, leading to high rates of intestinal and other illnesses. For most of the year and during droughts, such as the one in early 2006, surface water is unavailable, so the villagers walk nearly five kilometers to gather water from the nearby town of Kibwezi.

One villager, Robert Malii, immigrated to the United States where he now teaches preschool in the Manhattan neighborhood of Tribeca. When the parents of his students learned the story of his home, some of them decided to form an organization dedicated to improving life in Usalama. That organization, known as Mwikali's Gift, worked with the villagers to prioritize their needs. The first and most important was clean, sustainable water.

### Usalama Water Project

In a short period of time, the members of the newly formed Usalama Water Project had to become a working team. This meant learning the rules in which EWB-USA operates. It also meant understanding the scope of the project. Fortunately, the NGO, Mwikali's Gift, had commissioned a hydrogeologic survey before contacting EWB.

The findings of the report were the first hard data on the realities of the conditions on the ground. It was commissioned to investigate the potential for a borehole site in Usalama that could then supply water for domestic purposes to that community.

Drilling a borehole and pumping the water out and into a tank is a straightforward solution provided there is adequate groundwater. Unfortunately, the findings of the report determined that the ground conditions in and around Usalama are ill suited for drilling. The

report illustrated the subsurface conditions and fairly adequately described the underground water conditions in the region. Usalama is located in an area where all around is basement rock while nearby area is volcanic rock. As it turns out, the basement rock does not hold water and most of the water in the area flows along the volcanic rock into the nearby town of Kibwezi.

Even though the borehole option did not look very promising, the report included recommendations on alternatives to providing water to the village. The recommendations included distribution from nearby springs, from nearby towns or further investigations in the government owned forests. Given this result, it was clear that EWB-NY had to send a team to Kenya.

### EWB Activities

Engineers Without Borders-USA is an organization with multiple chapters. A chapter typically applies for a project with a specified project team. The members run the projects, led by a Project Lead. EWB's website at [www.EWB-USA.org](http://www.EWB-USA.org), provides many informative downloadable files detailing the organization.

The EWB-USA parent organization keeps in touch with the chapters by requiring the project teams to fulfill various obligations during the course of a project. These obligations include pre-site visit readiness checklists, post-site assessments, design plans, pre-construction approvals, etc.


Coupling a hierarchal and complicated organization with a new and inexperienced team resulted in many late nights of studying. Foremost, project members had to develop basic knowledge of engineering in the third world and water distribution. It was for this rea-

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Photo courtesy of EWB-NY

**EWB members Matt Sisul, Scott Snelling and Peter Riechers (l-r) investigate existing infrastructure in the village. This well, like many others, produces salty water unfit for drinking. There is also standing water around the well – a potential health hazard.**

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son EWB-USA assigned a mentor, Peter Riechers, from EWB-San Francisco, to the New York project team. He accompanied Scott Snelling and Matt Sisul on their site assessment in Usalama, Kenya.

### The Site Visit

According to Scott Snelling, project leader:

*“If the learning curve in preparing for the assessment was steep, it was steeper yet while we were on the ground in Kenya. From dawn to dusk, we met with government officials, inspected the region’s existing water infrastructure, and tried to soak up all of the relevant information we could.*

*We worked so hard that there never seemed to be time to eat a proper lunch. By the time we left Kenya my belt was fastening an inch shorter. Our exhaustion only added to the sense of accomplishment. Before leaving Usalama we had been able to discuss with the elders and announce to the villagers our three-phase construction plan for bringing water to Usalama:*

**Phase 1:** *construct a 2.5-mile-long pipeline and provide a chlorine doser (Usalama’s pipeline will receive water by tapping into an existing pipeline);*

**Phase 2:** *add a storage tank and additional water distribution points around the village; and,*

**Phase 3:** *irrigation.”*

### From Here On Out

Since the site visit, the Usalama Project Team has been working to see the project through to completion. The two main aspects remaining are fundraising and design. Both began at the project’s inception and both have developed with the team’s understanding of the project.

Fundraising has been an important responsibility and many team members are learning a lot about a subject that is generally unpopular but critical to a project’s success. A main focus of the group has been to acquire sponsors and donations, create fundraising events and write grant proposals. Each represents a different scale of support and each opens up new possibilities for the project and the development of Usalama.

**O**f course, the design is the key to a successful project and it has been evolving throughout the life of the project. Since the prospect of designing and constructing is a long one, the project team reached out to other EWB Chapters to help the village with auxiliary projects. In June of this year, a team from EWB-Urbana Champaign, IL, traveled to Usalama to help construct public latrines and teach valuable hygiene guidelines to villagers. With them, EWB-NY sent another project member, Matt Barber, to collect information critical to the completion of the design and continue to work with the leaders of the community. The community gave input on the design and, as a result, alterations were made in the design and schedule.

This updated design will be finished in the coming weeks and after peer review and remarks from EWB-USA, it will be passed on to our partners at Mwikali’s Gift, the community, and to the local Kenyan Water Office. Once all parties agree, the real difference can be realized.

***This article was written by EWB-NY’s Matt Sisul who works for Parsons Brinckerhoff in New York City, with contributions from Matthew Barber and Scott Snelling, also with Parsons Brinckerhoff. Project Lead Scott Snelling maintains an informative blog on the Usalama project at [www.usalamaproject.blogspot.com](http://www.usalamaproject.blogspot.com). Visit the site to find out more and how to donate directly to the Usalama Project. If you are interested in joining the New York EWB chapter; visit [www.ewbnewyork.com](http://www.ewbnewyork.com) or contact Mazda Riazi at [ewb\\_ny@yahoo.com](mailto:ewb_ny@yahoo.com). Check out the EWB main website at [www.ewb-usa.org](http://www.ewb-usa.org) for more information.***