Reliable, ready and accessible water

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Spartan engineers are showing their Spartan Will by helping a town in Tanzania achieve a more reliable, readily accessible, and sufficient water supply for their community.

MSU’s chapter of Spartans Without Borders (SWB-MSU) made trips to Mabibo-Makuburi in the city of Dar es Salaam, Tanzania, in 2013 and 2014 to supervise the construction of a well water distribution system at the Mabibo Lutheran External Church and work toward the gift of clean water.

James Rice served as the co-technical lead. He is from Laguna Niguel, Calif., and earned a bachelor’s degree in civil engineering in May 2014.

“It began in August 2013 when three members went on an assessment trip to Mabibo-Makuburi to meet with community members, take water quality samples, obtain measurements where the well would be drilled, and meet with a government well drilling agency,” Rice said.

“Using the data collected from the assessment trip, design alternatives for a borehole well water distribution system were prepared to satisfy the needs, priorities, and constraints of the Mabibo-Makuburi community.

“A design alternative was then selected by the community and preparations were made to implement the borehole well system in August 2014.”

Six members went back to the community in August 2014 to implement the borehole well system. Travel team members also presented lessons on proper health and sanitation to local children and adults.

Environmental engineering major Samantha Eanes served as the other co-technical lead on the project. She is a
senior in environmental engineering from Stanton, Mich.

Eanes said water sampling was conducted during the 2013 trip, during which they also arranged for a hydro-geological survey of the area.

“Based on those results, we anticipated the well would have a high salt concentration,” Eanes explained.

“When we received the water quality results from the well drilled in 2014, it was discovered that the well did not have a high salt concentration. Therefore, with proper treatment, the well water could be used for drinking and cooking, in addition to sanitation and cleaning applications.

“We’re still in the monitoring period, but that is such good news.”

And it makes the experience even more rewarding, Eanes noted.

“I was overwhelmed at the hospitality and the gratefulness of the community we are trying to help," Eanes continued. "When we were working here at MSU, we were proud of what we were accomplishing, but seeing their reaction is absolutely priceless.”

Susan Masten, professor of civil and environmental engineering (CEE) and the adviser to SWB, said the chapter not only provides students an opportunity to apply engineering knowledge to real-world situations, but also leaves a lasting impact in a community that could use the help. "We often talk about MSU students changing the world. In this case, they are."
Masten acknowledged the guidance of CEE Emeritus Professor David Wiggert and colleague Kurt Guter for their assistance with the project and financial support. “In addition, we should acknowledge financial support from the College of Engineering, ColorMeRad, University Lutheran Church, and the CEE department, along with several anonymous private donors,” Masten added.

The new well at the Mabibo External Lutheran Church will help alleviate water shortages not only for the church but for the residents for the Mabibo-Makurburi community. The church will sell water to residents regardless of religious affiliation and at an affordable rate.
“We’re proud of our international development work and grateful to see first-hand how engineering can positively impact people’s lives,” Eanes added.

**Travel team:**

- Tulakemelwa Ngasala – project coordinator, PhD student in civil and environmental engineering from Mabibo-Makuburi, Tanzania;
- Samantha Eanes – co-technical lead, a senior in environmental engineering from Stanton, Mich.;
- James Rice – co-technical lead, of Laguna Niguel, Calif., who graduated in May 2014 with a bachelor’s degree in civil engineering;
- Elisabeth Warner – education lead, a senior in mechanical engineering from Midland, Mich.;
- Justin Roe – education team member, a senior in materials science and engineering from Farmington, Mich.; and
- Andrew Accardo – health and safety officer, a senior in chemical engineering from Northville, Mich.

“As a Spartan Engineer,” Rice added, "I would encourage others to seek out international opportunities either by studying abroad or getting involved in an international development project. It is an immensely rewarding experience to go abroad. You can learn a lot about yourself by spending time among people of different cultures and the more you can do it before you graduate the better.”