



# Sustainable Irrigation Projects for Rural South Africa



## BACKGROUND

KwaZulu-Natal, South Africa suffers from one of the highest HIV/AIDS prevalence rates in the world. This, along with the lingering effects of political violence from the Apartheid era, has left rural Zulu communities without basic commodities. The lack of rural development forces a large number of working-age adults to search for jobs in larger cities and elderly grandmothers (ngogos) are left with the primary responsibility of caring for orphans and vulnerable children.



## EWB-USA

Engineers Without Borders is a non-profit organization established in 2000 to partner with developing communities worldwide in order to improve their quality of life. The Johns Hopkins University chapter (EWB-JHU), established in Spring 2005, seeks to fulfill these goals through the participation and partnership of students, professors, and professionals.

## THE NEED

The elderly women of many rural Zulu communities practice subsistence agriculture to support the children under their care by manually carrying water to the gardens from nearby streams. This not only places great physical strains on the grandmothers, but also takes time away from other daily activities, that includes educating the children.

The ram pump offers a low-cost, low-maintenance solution, using the hydraulic power of flowing streams to deliver irrigation water to these community gardens year round. Such systems will increase crop yield and improve the nutritional diet and general well-being of the communities.

## THE EWB-JHU RESPONSE

Recognizing the need and tremendous benefit of the ram pump irrigation system, EWB-JHU initiated the South Africa Project and established contacts with the local NGO Church Agricultural Project (CAP) in fall 2005. After an initial assessment in January 2006, the team worked throughout the school year to plan the project's logistics. Fundraising was a major effort that included community outreach, professional organizations (ASCE, Rotaries, JHU Alumni), and personal contacts.

## PROJECT IMPLEMENTATION

Collaborating with a local agricultural prep school (Zakhe Agricultural College- ZAC) and local NGOs (Durban and U.S. Rotaries and CAP), EWB-JHU has traveled to South Africa and implemented four total community irrigation systems in the past two summers.

In June 2006, faculty advisor, Dr. William Ball, and pump designer, Dave Alcock of CAP, guided a team of 15 students from the



*Dave Alcock supervises the team members as they prepare for the installation of the new ram pump system.*

Engineering, Arts & Sciences, and Public Health schools to install ram pump irrigation systems for the communities of Inchanga and Maphetheni within the Valley of 1000 Hills. Each day, students worked hard to dig trenches, move rocks, install piping, and build the pump units.

The summer of 2007, EWB-JHU returned to work with the inspired "Agriculturalists Without Borders" from the ZAC to successfully implement two more pumps for the communities of Phatheni and Esimozomeni near Richmond. The team also revisited the 2006 sites and was astonished by the tremendous progress seen at the gardens irrigated with the ram pump. This work was conducted in close collaboration with the Durban Rotary Club and the Fort Collins Colorado Breakfast Rotary Club with major funding provided by these groups, several other U.S. Rotary clubs, two Rotary Club districts, and The Rotary Foundation.

This past year has been EWB-JHU's most productive. In January 2008, EWB-JHU and ZAC students installed a demonstration pump on the ZAC campus to teach them the technology and to promote long-term sustainability. The trip successfully forged deeper relationships between EWB-JHU and ZAC as they worked together. During the summer, a two-part assessment and implementation trip allowed the students to discover new areas of need and realize better the cultural identity of the people. Students implemented a ram pump in Ndwedwe, an area in which the students hope to return in the future.



*Students with the gardeners at Ndwedwe after the successful implementation of the ram pump.*

## ADDITIONAL INFORMATION

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**EWB-JHU**

