

NESSC PARTNERS WITH ENGINEERS WITHOUT BORDERS-USA -AFRICAN VILLAGE RECEIVES SITE ASSESSMENT-

By EDWARD H. WINANT, PH.D., PE
RESEARCH ENGINEER, CANAAN VALLEY INSTITUTE



ENGINEERS
WITHOUT
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USA



All photos by Ed Winant

Home to approximately 800 people, most of whom work on pineapple plantations and in their own subsistence plots, the village of Obodan is like many in the Akuapim South District of Ghana, a major pineapple-growing region. The high priority of cash crop farming reduces the availability of protein in the local diet. Anthony Akunzule, a veterinarian with Ghana's Ministry of Agriculture, has worked with the village to promote chicken farming to provide this extra protein for the villagers.

While there, Akunzule noted poor sanitation and the lack of good water sources for the residents. Of three drilled wells in the village, only one had a functioning pump, which drew long lines in the mornings and evenings as children gathered to collect water for their family's daily needs.

A second well in the village was contaminated, and the third well went dry soon after it was built. A nearby creek also provides water, mostly for laundry and bathing; but in the dry season, it's barely a trickle.

As for sanitation, the village's public latrine dates from the 1950s. The holding pit is full, while the roof and walls of the latrine are broken and need repair. Several homes have individual latrines, but these are far from meeting the villagers' needs.

NO HELP IN SIGHT

According to the standards of the district's community water and sanitation office, a village the size of Obodan should have two to three working water sources. With a working pump and three drilled wells listed on the record, Obodan is far down on the district's list of priorities. With no official help in sight, Akunzule turned to international donors to find help for Obodan.

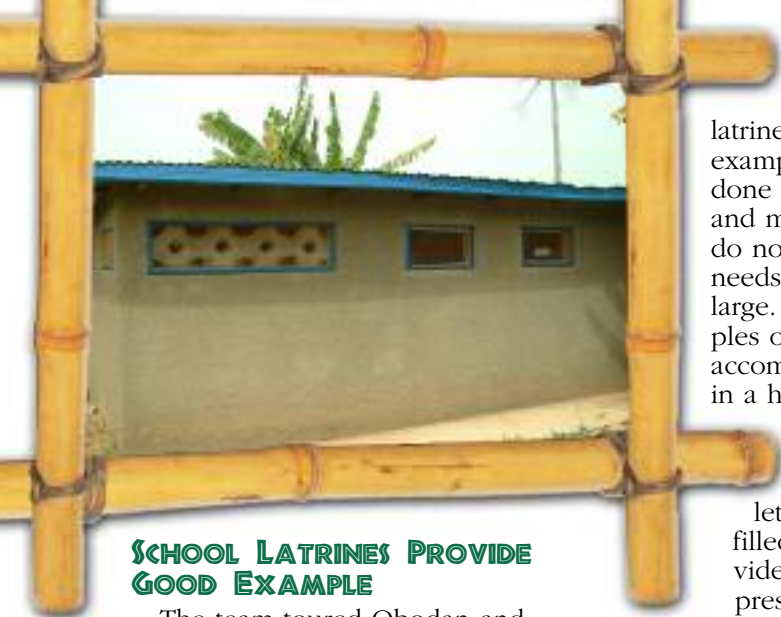
In his search, he happened upon a relatively new organization, Engineers Without Borders, USA (EWB). Akunzule

applied for assistance to provide water and sanitation to Obodan, which the Columbia University student chapter accepted. Students from this chapter planned a feasibility study in January 2005 to gather information about the village and the region and to plan the water supply project.

When their campus advisor was unable to accompany them, they turned to the national office of EWB for a mentor. Responding to a request from EWB, National Environmental Services Center (NESC) engineer Edward Winant (now with CVI) agreed to accompany the feasibility team to Ghana to oversee the initial study.

The team flew into Accra, the capital of Ghana, in January 2005. After a day to recover from jetlag and to locate lost luggage, they set about gathering information. Their chief priority would be assessing the village's needs and capabilities.





SCHOOL LATRINES PROVIDE GOOD EXAMPLE

The team toured Obodan and visited the existing water sources and sanitation facilities. A senior secondary school (SSS), junior secondary school (JSS), and primary school, all located within the village, have public latrines for the students. In addition, the SSS is constructing a dormitory for girls from surrounding villages.

The SSS was recently converted to one of the first all-girl schools in Ghana and is expanding to accept students from a much wider area. With the dormitory, the school was digging a new latrine and a shallow well with a hand pump to supply a water storage tower.

The schools' latrines provide a good example of what can be done with local resources and methods, but they do nothing to relieve the needs of the village at large. Two other examples of what can be accomplished are shown in a house and the SSS, which are provided with flush toilets. These toilets use water towers,

filled by trucks, to provide the necessary pressure, and both have septic tanks and seepage pits for effluent treatment.

Again, however, these examples do more to show the lack of adequate sanitation for the village as a whole. Surrounding villages also offer good contrasts.

OTHER VILLAGES NEED SANITATION

While in the country, the team also visited Adwokrom, about a kilometer northwest of Obodan and home to 500 inhabitants. They provided the village with a solar-electric pump and water

tower. The pump fills a raised reservoir, which distributes water to four public taps. The system is relatively simple with no automated controls.

The pump must be switched on manually when the tank is low, and there is no battery storage for periods of decreased sunlight. A pedal backup is available for operating the pump manually when needed. This village, however, is in worse straits for sanitation, as their public latrine is merely an earth pit covered with logs.

Another village, Akwasi Doi, located approximately one-and-a-half kilometers northeast of Obodan, has about 300 residents. The village has a drilled public well and hand pump and a composting latrine. This latrine is maintained regularly and has a prefabricated, watertight holding pit with two access hatches and wind-driven ventilating fans on the outlet stacks. These fans pull stagnant air and odors out of the latrine.

TEAM GATHERS INFORMATION

In addition to site assessments in Obodan and surrounding villages, the team spent time visiting government agencies, non-governmental organizations (NGOs), and scientific



research centers to gather information useful for the project. The district chief executive of Akuapim South and his engineering staff proved very helpful in providing information about the district environs and ideas for the project in general.

The regional community water and sanitation office helped with details about existing wells in Obodan in addition to other water projects in the area.

In Accra, the Council for Scientific and Industrial Research gave detailed soil and groundwater information through their Water Research Institute and Soil Research Institute. The hydrological services department, dealing mostly with surface water resources, assisted in determining that groundwater sources would have to be used.

TEAM UNCOVERS PROBLEMS

Problems underlying the water supply picture for Obodan are in the rocks beneath the village. The region sits upon granite bedrock about 20 meters below the surface. Boreholes are typically drilled into the granite bedrock and may or may not hit pockets of water contained in the rock fractures.

Shallow wells tap into the water table in the sandy clay soils above the granite, but these sources are not protected and are prone to surface contamination. Fertilizers and chemical sprays from pineapple plantations, as well as latrines and animal waste, can all affect this upper, unprotected aquifer.



The costs for any proposed projects must be supplied by charitable donations. The team focused on which projects are most suitable and appropriate for the village, and which ones can be accomplished within the limits of the money raised.

TEAM PROVIDES A PLAN

Based on the assessment trip to Obodan, the EWB team came up with a plan to construct a new village latrine, bore another well, and provide a hand pump to increase the supply of clean water.

The team also demonstrated safe excavation techniques to the villagers, such as shoring the excavation while working in the pit—but mostly, the team brought funding, hope, and a willingness to help others.

NGOs, including WaterAid and Ricerca eCooperazione contributed information and advice about water projects since both groups are active in finding water supplies for rural areas of Ghana.

For more information about EWB, visit their Web site at www.ewb-USA.org/



Raised in West Virginia, **Ed Winant, P.E.**, has worked for the US Indian Health Service, served in the Peace Corps for two years in Cameroon as a Water Resources volunteer, and worked as an engineering scientist for NESc prior to joining the Canaan Valley Institute this year.