ciplinary package of technical inputs before technology became of real use to them. These farmers, many of whom are women, required not only farm machinery, but also technology to overcome other bottlenecks in their daily lives such as water supplies, sanitation, access to rural workshop facilities, cooking, washing, housing, etc.

A feasibility study showed that while excellent work was being done by individuals in some organizations, it tended to be scattered all across Zimbabwe, with very little effective documentation and integration. The study recommended that the University of Zimbabwe establish a central, professional multidisciplinary center.

The center uses university resources or makes use of other existing resources and expertise. The goal is to improve the well-being of people in low-income rural areas through better transfer of the technology they need. The center has also been given the responsibility of facilitating the integration of communal areas into the main stream of the socioeconomic development of the nation, to improve small and medium-scale industry, to increase employment opportunities, to make better use of local resources, and to reduce the demand for foreign currency.

This is a very large order for a small group that is chronically understaffed and underfunded. But with the growing demand for its services, as well as the interest from potential collaborators and supporters, DTC looks forward to increased growth. Additional staff, for example, would allow more time for lecturing to outside groups and schools, and for the introduction of a course in small-scale appropriate technology at the certificate or diploma level. There is also hope of adding a department of agricultural engineering to the university. •

---

*Jeremy Ascough is the Director of the Development Technology Centre at the University of Zimbabwe. For further information, write : DTC, P.O. Box MP 167, Mount Pleasant, Harare, Zimbabwe.*

# VITA News
# Reader Survey

Almost 200 of you took the time to respond to the Reader Survey published in the January 1989 issue of *VITA News*. To our relief, most of your comments were favorable. Nearly all of you like the the magazine, and your criticisms were thoughtful and helpful. We will make good use of your suggestions in planning future issues to make the magazine even more useful and informative.

Some specific suggestions include:

• Focus each issue of *VITA News* on a particular topic and broaden the scope of articles included. — This has been done in the past, and future issues will have a topic focus as often as possible.

• Publish more "how-to" and technical articles. — We encourage readers to submit technical or how-to-articles about topics in their areas of technical specialty. And we will enlist the aid of VITA Volunteers and others to prepare more articles on specific technologies.

• Include more articles about specific topics [in the reader's areas of interest.] — We will make use of these topic suggestions as they fit in with the main focus of individual issues and as authors become available.

• Include more information about VITA Volunteers and list opportunities for volunteers to lend their technical expertise. — We will publish some of the letters we receive from individuals seeking advice or assistance to solve their technical problems. Readers who are able to offer help can respond to the inquiries. VITA Volunteers are also encouraged to write about their experiences in the field or correspondence they have had in helping to solve problems for individuals in developing countries, along with biographical information about themselves for use as short profile articles in future issues.

• Add more articles about programs in education, health, arts, and humanities. — We will from time to time present articles or an issue in one or the other of these fields. (See the January 1987 issue on health, for example.)

Comments about the design and appearance of *VITA News* ranged from "excellent and keep up the good work" to "get rid of the ugly boxes around the photos." Readers will notice that changes have already been made and should look for more changes in future issues.

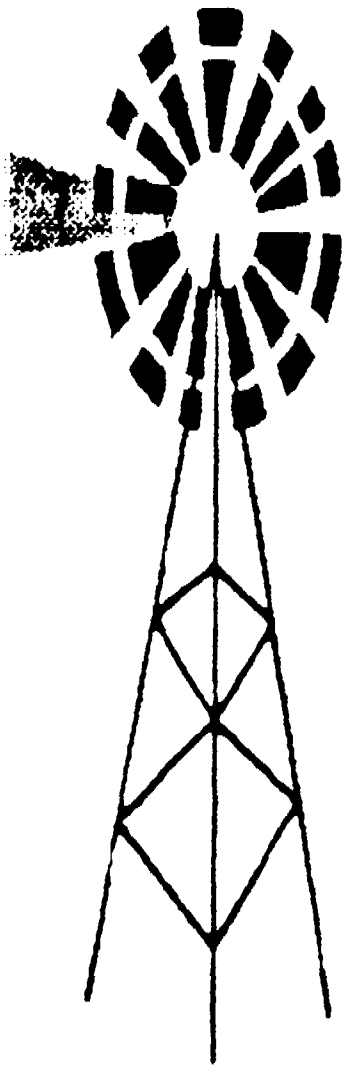
We encourage any and all readers to send us articles. Photos or drawings to illustrate them would be very helpful as well. We also welcome any additional comments or suggestions about the magazine at any time.

For more information about submitting materials to *VITA News*, please contact the editors.

# Honduran Water Project: A Model for Sustainability

***Roatan Water Supply Project Revisited***

*By Sandra Wark*



Village women on the Honduran Island of Roatan used to spend up to six hours carrying water on their backs to their households. They suffered health problems from standing in pools of mud while they collected water. Their children often went to school dirty and some had skin infections and diarrhea from unclean water. But 10 years ago, APRODIB, a Bay Islands development agency, with USAID funding and technical assistance from VITA, went to work to change the situation by providing piped potable water to a number of villages on the island.

Last October, VITA Volunteer Ed Kennell visited 10 of these these villages to see how their water supply systems were working and to assess the sustainability of this self-help water project. Kennell along with his wife Marilyn, both of whom are wind energy specialists, first visited Roatan in 1984 when they spent four weeks installing windmills and pumps and training APROBID technicians. Mr. Kennell made follow-up visits in 1985 and 1986, in addition to this 1989 visit. VITA has traditionally worked to assure that projects continue to function long after its volunteers have left and assistance has ended by making follow-up contact and visits. These follow-up visits also provide lessons learned to be applied to other VITA projects in similar conditions elsewhere in the developing world.

VITA Volunteer specialists began working on Roatan in 1981, to conduct ground water and soil surveys for the well installation project. Other volunteers assisted with the well drilling and trained technical staff in drilling operations and spring development. Both solar and wind pump specialists then installed pumping systems and provided on-the-job training in pump installation, operation, and maintenance. In addition, technical assistance was given to local staff to design construction techniques for improved latrines.

**"The successful projects were ones that were able to bring together the appropriate technology, local support, and the personal determination of a few village people committed to make their project work."**

During his follow-up visit, Mr. Kennell found both some successes and some failures. Eight of the ten villages he visited in October still had functioning systems, though some had changed the pumps they used and some had reduced services or faced other problems. The successful projects were ones that were able to bring together the appropriate technology, local support, and the personal determination of a few village people committed to make their project work.

Willy Bennett and Francine Rich of Pollytilly Bight are two such individuals. Pollytilly Bight is the site of the first

photovoltaic water pumping system on Roatan. Panels of photovoltaic cells are used to convert solar energy into electricity to run the pumps. The village consists of 41 homes with three additional homes under construction. It's a tightly knit community densely gathered around the Central Protestant Church. Mr. Bennett is in charge of system operation and maintenance and Mr. Rich, the current water board secretary, collects the six-*limpera* water fee from residents.

The present water pump is the third at this site and does not operate at full capacity. In an attempt to control consumption and provide for equitable distribution, water is only pumped from the cistern on Mondays, Wednesdays, and Saturdays for a period of six to eight hours. Residents are allowed to fill one 55-gallon drum and several buckets during this time. Clothes washing is also saved for "on" days.

While the arrangement is far from ideal, it is an improvement over the "old days." Pollytilly's women and children have benefitted the most from the system. They have been saved the burden of carrying water long distances on their backs from surface wells. School attendance has improved and health problems have decreased, especially children's foot infections contracted by standing in the contaminated muddy pools around the surface wells.

*A solar pump control panel.*

Village women are the driving force behind the success of Pollytilly's water system. They are active on the water board and are expanding their role to promote the eventual electrification of the village. With electrification, improved pumping technology will be available allowing for continuous water service and better storage methods. One indication of the broad community acceptance of the project is the 70 percent collection rate of water fees, a high rate compared to like projects.

*Children get drinking water from a pump run by wind power.*

Flowers Bay, located at the far southwest end of Roatan, is the site of another successful water supply system. Like Pollytilly Bight, the village has a strong sense of community. Due to high water demand from the 80 taps arranged along the shoreline, a diesel pump was installed. Presently, water is available four days per week with the tank refilled on "off" days.

Clarendon Bodden, his wife Consuelo, Rudolph Brooks, and Nelda Bodden form the committee that administers the water system. A 10-limpera fee is collected from 50-70 percent of the users and is applied to diesel and maintenance costs. By all accounts, the system has been a great success with almost feeling that the benefits of less hauling of water and fewer skin infections due to cleaner water and cleaner areas around the pumps are well worth the cost.

Emma and Barbara Elvin and Karen Muñoz, the combined school board and water board, are the capable managers of the Jonesville Point water supply system. Despite basically good management, the project has had some problems.

Jonesville Point, a 40-home village sitting along the shoreline of a large inlet, was the site of an earlier windmill installation in 1983. Salt intrusion reduced the usefulness of the first well, and in 1986, APRODIB installed a solar pumping system in a new well north of the old system.

The village has a well-developed tradition of rain water collection and a large number of both flush and water seal toilets. Because of the salinity of the water from the first system, many people used well water only for washing and for toilets, a habit that continues today. Most houses have two taps and the rainwater system is used mostly for cooking and drinking. Many people understand that the well water is more

healthful because it is reduces the incidence of water-related diseases such as diarrhea and enteritis, but because the well system does not always have adequate pressure, they must constantly switch back and forth between sources.

The system has operated fairly well," according to Emma Elvin, "but we've had two major pump problems and numerous leaks in the supply lines due to animals and undercutting during the wet season." Maintenance is handled by whomever in the village has the time and expertise to handle the repairs and is paid out of the treasury. The board has over 1,000 limperas in the bank even though the 15-limpera monthly fee is collected from only 20-30 percent of the residents.

Poorer members in the community, who tend to live at a higher elevation, are the first to have to carry water from afar during periods of low production. So far no effort has been made to store water or to institute a rationing program similar to other communities. The result, then, has been relatively uneven distribution of pumped water.

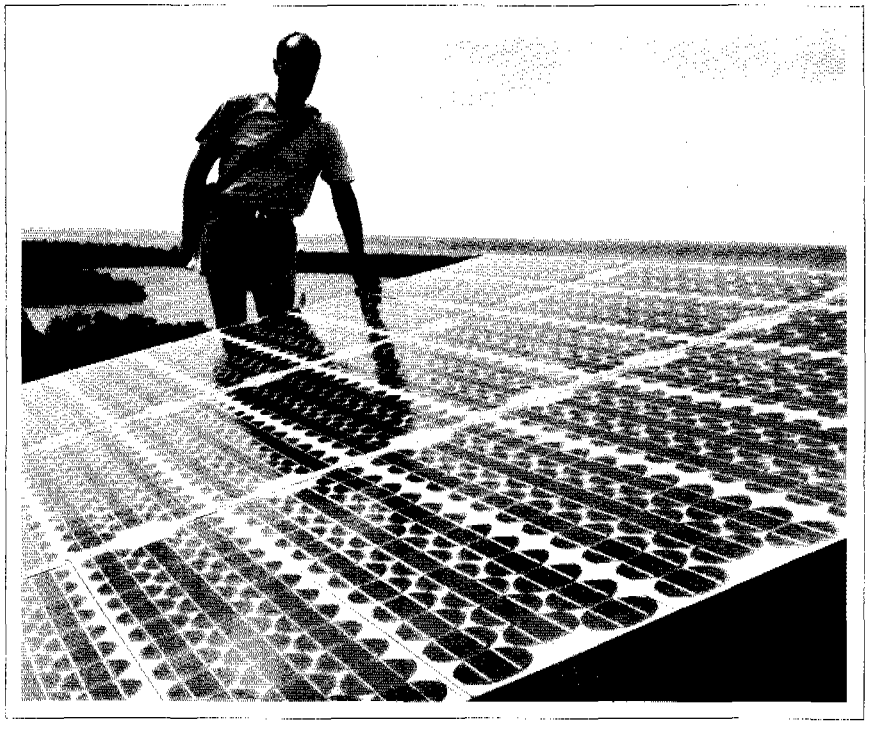
The Juticalpa village project is one of two out of the original ten projects Mr. Kennell visited that no longer functions. A Baker windmill was installed early in 1984 and performed erratically for three years. At that point, it was determined that the site was unsuitable for wind power and the village was left to its own resources.

Two years have elapsed and the water board is still intact. Treasurer Anastacia de Lemos and Secretary Juana Conception felt that an operational water system should be the highest priority of the community. Juticalpa is a rather poor village of 31 houses located just off the ridge road between French Harbor and Oakridge. The community is scattered on both sides of a canyon leading to the sea but it is still fairly cohesive. Ms. de Lemos and Ms. Conception agreed that the village's quality of life had improved, both in time savings and better health for their children, when the water system was running.

Since the water system broke down, the women of the village have had to carry water from small surface springs far below the village. When these wash out, a modest amount of rain water is collected from downspouts. According to one villager, water collection is mostly the domain of women and children as the men are only interested in having water, and do not traditionally collect it. The water board still has about 3,000 limperas in the bank. The community is considering the purchase of a small generator and the installation of an electric pump in the existing well. They are still about 7,000 limperas short on funds but collection is continuing. Another hope is that ENEE (Empresa National de Energia Electrica) will complete the power line to Oakridge that will pass quite close to the well site.

Roatan has provided VITA with some valuable insights for future work. Many of the problems that exist are linked to social problems in the villages rather than to specific technological failures. Future VITA projects will most certainly employ a rural development adviser/sociologist as well as a health educator to work closely with community leaders in its water supply efforts.

On the technology side, more extensive systems will have to be installed in order to meet the demands of a growing Roatan island population. In addition, the establishment of a central maintenance facility would ease problems of both maintenance and replacement of existing pumps and spare parts. Such a facility also represents a potentially profitable enterprise for area businesses. However, even with all the problems, Mr. Kennell reports that the effort on Roatan is one of the most successful water projects he has seen in Latin America. •



*Vita Volunteer Ed Kennell with solar panels at Pollytilly Bight.*

---

*Sandra Wark, a student at Georgetown University, is an intern with VITA. This article was based on a recent trip report submitted by Ed Kennell.*