Village Empowerment: Toward Sustainability in International Service-Learning

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The purpose of this workshop is to discuss the results to date of designing, installing, and monitoring student systems as part of the Village Empowerment Project: how well they have worked; the impact they have had on the villages, students, and faculty; and the lessons we have learned. These lessons are expected to be useful to educators in developing programs serving remote areas of developing countries. The background of the project is presented first and student projects are shown and discussed: transceiver communication; water supply and purification; lighting and personal computers; vaccine refrigeration and other medical equipment; and microenterprise (aquaculture and solar lanterns and headlamps).

The project had its beginning in the summer of 1997 when a group of undergraduates wanted to do international service work and asked the then-chaplain Fr. Paul Soper. He and the students visited mountain communities in the Peruvian Andes, about 300 km north of Lima, near Huarmey and Casma. Though Huarmey and Casma have electricity, telephones, and a hospital staffed by several doctors and nurses, the mountain communities are generally without electricity or communication, but have a clinic staffed by a trained medical technician. The larger villages have schools, some up to grade 12, typically without even books and paper. Some of the villages rely on water from rivers that has to be hand-carried to houses and clinics. The people in these networks of villages are representative of: one-fourth of the world without grid electricity (IEA, 2006), one-sixth with no access to clean water (UNDP, 2006), and about one-half living on less than $2 a day (World Bank, 2004) (CIA, 2004), and some of the one-sixth living on less than $1 a day and barely surviving (Sachs, 2005; World Bank, 2004).

In the 10 years of the project (which we now call Village Empowerment), we have installed over 75 systems in 34 villages and in Huarmey and Casma. More than 100 students and volunteers, from U Mass Lowell as well as other colleges, have participated in this project and made 20 trips to Peru. All of these systems were designed and installed by undergraduate and graduate students and local people, assisted by faculty and experienced volunteers. Many of these systems formed service-learning projects (e.g., Duffy, 2000), providing projects for 15 courses at U Mass Lowell. These courses form part of a program called SLICE: Service-Learning Integrated throughout a College of Engineering. The aim is to have each student each semester have at least one course with a service-learning project.

We have chosen to focus on infrastructure development for a variety of community end uses in a relatively small network of villages in order to help ensure the sustainability of these systems through returning to existing systems to keep maintaining and improving them and through expanding the types of infrastructure needs met in the same networks (health care, education, communication, energy, water, food production, housing). The sustainability of these infrastructure systems is a key goal of our project in keeping with the vision of a balance between advance of technology and preservation of the natural/human environment.

Most of these systems utilize renewable energy to provide lights, transceiver radio communication, laptop computers, educational experiments/lessons, water supply, drinking water purification, biogas, and various medical needs (vaccine refrigeration, nebulizers, and sterilizers). These systems are powered by photovoltaic (PV) modules, solar thermal collectors, and microhydro generators, to provide for continued sustainability (in energy supply, economic costs, and environmental impact). In addition, startup microenterprises have been initiated for aquaculture for trout and crayfish as well as solar lantern and headlamp manufacture and rental.

Microenterprises are under development for the manufacture and sales of photocatalyst-coated recycled plastic bottles for water purification.

Students have been mainly from the U Mass Lowell engineering school. However, students from more than a dozen other colleges and universities and from many different disciplines have been involved. The project welcomes participation of faculty, staff, and students from any appropriate discipline and school. The real needs of the villagers cannot be met by people from one academic area.

By the end of the workshop, the participants will be able to:

- Describe various interdisciplinary projects that students can design and install/implement for villages of indigenous people in some of the poorest areas of the world;
- Characterize the program aspects that ensure sustainability of the projects as well as the program from energy, environmental, economic, ethics viewpoints;
- Assess the success of such programs in student learning and in meeting real community needs; and
- Avoid the danger in the apparent popularity in students participating in service-learning projects involving "one-shot" designs and installations in which there is no sustained involvement for training, maintenance, and replacement.

References

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