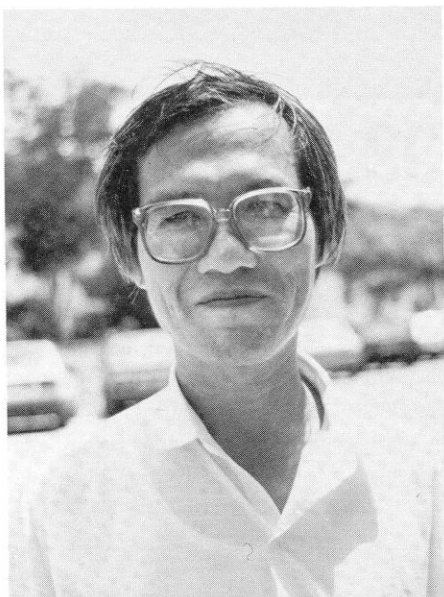




Dr Goh Sing Yau

most suitable arrangements for fabricating the pump in their own countries. The Sri Lankan team, part of an NGO called Sarvodaya, has made much progress in manufacturing its SL5 handpump in small workshops run entirely by women. The program's success to date has prompted Sri Lanka's National Water Supply and Drainage Board to order 225 pumps, and UNICEF has asked for 300.

This is only a beginning. Negotiations are now under way for IDRC and the Canadian International Development Agency to assist in a major expansion of Sarvodaya's operations to Sri Lanka's southern dry zone. A total of 120 women in 60 workshops will be trained to manufacture, install, and repair the pumps.

In Malaysia, injection molding of plastic parts has been successfully used to mass produce some 4000 Unimade pumps, both for Malaysia's domestic rural needs and for the rest of the projects in the IDRC network.

For those researchers now field testing the Unimade Mark IIs and IIIs in their own countries, the issue of pump fabrication is not so much one of actual manufacturing technologies such as injection molding and jig design — the Malaysians have already perfected these. Rather, the researchers need to know how manufacturing operations can best be organized and managed in their own countries. For example, how much of the work can or should be subcontracted out and how can quality control be ensured?

As the various projects advance into the manufacturing phase, the new research and training centre in Malaysia will provide the solid technical backing they need. Eventually some of the participating projects may themselves become training centres to help neighbouring countries to profit from handpump technology too.

By helping to launch the new centre, IDRC is protecting its heavy long-term investment in handpumps and making the technology available to those who need it.

The promising technical results so far achieved must not be ignored or forgotten — like dusty old lab reports on a top shelf or rusty, broken-down pumps abandoned for lack of spare parts. Rather, they should be transformed into clean drinking water for millions of villagers. ■

WATER FOR THE BARRIOS

The Malaysian "Unimade" handpump is being put to the test in six countries. In the Philippines, it has caught the attention of water planners and politicians alike, including the President, Corazon Aquino.

During the oppressively hot Philippine summer which begins in April, the province of Camarines Sur becomes a parched land. Farmers shimmer like mirages in their now barren rice fields. Few people venture out into the midday sun, preferring instead the shelter of mango or coconut palm groves. And water becomes a precious commodity.

In the "barrio", or township, of Santa Elena Nabua, the family of Salvacion Regalado used to get drinking water directly from the rice fields. But with the growing use of agricultural chemicals, the water became contaminated, so they collected rainwater in a simple hole in their backyard, which unfortunately dried up in summer.

The people in these and other communities in Camarines Sur still use water with great respect during the dry season. However, supplies are becoming more reliable, accessible, and safe for some of the families due to the installation of handpumps made with plastic components and designed with the special needs of villagers in mind.

Clean water is one of humanity's most basic needs. Yet three-quarters of people in developing countries do not have access to adequate potable water. In the Philippines about 60 percent of the rural population is without access to safe water.

IDRC has supported handpump research and development for 12 years (see previous article). The testing of pumps in barrios of the Philippines is just one component of an international network of IDRC projects to record pump performance and villagers' reactions to the designs so far developed. These projects are also investigating which types of community participation ensure fair sharing of the water and correct maintenance of the pumps, and which approaches to manufacturing best match local conditions.

In the Philippines, field trials of a Malaysian-developed pump, the Mark II Unimade, began in 1984. The University of Malaya in Kuala Lumpur, Malaysia, provided the guts of each pump — the piston, foot valve, and cylinder assembly. The above-ground components, namely the metal stand, cover, and wooden handle, were built by a Philippine technology centre.

Nationally, the project was coordinated by Philippine Business for Social Progress (PBSP), a nongovernmental organization with extensive experience in rural water projects and funded largely by local businesses.

In Camarines Sur, the main target area, the work was carried out under PBSP's supervision by the Naga City Social Action Center (SAC), a service arm of the local Catholic church. Pumps were given to small communities that already had a local organization in place to take responsibility for the project, or to ones prepared to form such an organization. Women played the major role in the project (see box).

In Barrio Santa Elena, Concepcion Regalado, the sister of Salvacion, was chosen as a project "monitor", the person responsible for pump supervision and maintenance. A pump was put in her yard because she was a member of a Christian farmers' self-help group.

When other villagers saw how easy it was to operate the pump — even for children — practically everyone wanted one of their own. But they were told they would have to pay part of the installation cost — an average of 1300 Philippine pesos (CA\$85). As no one had this sum available in cash, payments were arranged in several installments.

Some of the villagers were surprised. In the past, officials from Manila had given them such equipment but had never asked for anything in return but their support in the next election. Never had the intended beneficiaries been asked whether they thought the gift was suitable. Although such projects got off to an enthusiastic start, they often petered out. This was the expected outcome of such aid.

Asking the villagers to have a financial stake in the project was seen as a way to break out of this unprogressive cycle. "We have an agreement that any project like this will not be a dole-out, because the people are so used to dole-outs they don't know how to take care of themselves," says Monsignor Alberto Nero of the Social Action Center.

"We would like to uplift them by telling them that the repayment will be a help to other groups like them. The money will be used to finance other projects. They, being poor, will now be in a position to help other poor people like themselves."

In fact, the village handpump project was as much about building self-confidence and self-reliance among villagers as it was about developing a safe water source. Mediatrix "Peanuts" Valera, leader of the Philippine pump project for PBSP, says water projects "can interest and motivate the villagers to develop cooperation and even foster unity among themselves."

This is not to say that the handpump project has been without technical hitches. Of the 27 Mark II pumps installed in Camarines Sur, only

President Aquino with Unimade handpump. Far right, mother and child in Camarines Sur — the real beneficiaries of pump technology.



Photo: Edison Dy Ong



Photo: Gerry Toomey / IDRC

four performed flawlessly between September 1985 and March 1987. Outside Camarines Sur, four of the nine installed developed problems.

In some cases, bolts made of acetal plastic on the below-ground components have broken under the stress of use, indicating a manufacturing flaw. "You may get high quality acetal in Canada but not necessarily in developing countries," explains Prof. Goh Sing Yau, the engineer who piloted the development of the Unimade Mark I and II, as well as the latest version, the Mark III.

Another common problem has been worn piston rings. In locations where the well water is rather sandy, the rings have been wearing out more quickly because of abrasion and have sometimes damaged the walls of the riser pipes.

In Barrio Santa Cruz, the villagers responded to such problems with down-to-earth resourcefulness. When asked by some IDRC visitors whether spare parts were a problem, one responded, "Leave a pair of tsinilas (sandals)!"

Sandals? The pump piston rod was quickly pulled out of its casing and the riddle solved. To replace a piston ring, a round piece of a child's rubber sandal had been cut out and inserted in between two sections of the piston. As a temporary solution it did the trick nicely.

Reports of such problems by the villagers have been a crucial part of the research project. They have enabled Prof. Goh and his team in Malaysia to improve their product. The acetal bolts, for example, have been replaced with stainless steel bolts, which cost about the same.

Prof. Goh is also experimenting with rubber cup seals to replace the PVC piston rings. He notes that at each stage of the pump's development, the cost goes down. A Mark III, he says, could be sold for between CA\$155 and \$195 to be competitive.

The Philippine users of the handpumps have also learned something as a result of these technical hitches. They realized that they had to cooperate with the village project monitors in regular maintenance of the pumps. Immediate attention to even minor repairs was seen as important.

In September 1986, Philippine President Corason Aquino called on the country's business community to throw its support behind national development. PBSP's pump project with IDRC, in particular, had caught the president's attention and she asked the organiza-

tion to draw up a plan for rural water delivery using a variety of technologies — deep wells, springwater collectors, rainwater cisterns, and handpumps.

The result was the creation of a national, privately supported water agency called the Tubigan Foundation. With Tubigan money, PBSP proceeded to install 250 handpumps, including 50 of Prof. Goh's Unimade Mark IIIs.

On January 22, 1987, under the hot Philippine sun in a squatter settlement of Cabanatuan City, Mrs Aquino inspected a newly installed Mark III and pumped water with it. This was part of a ceremonial handing over of PBSP's water projects to the new Tubigan Foundation.

A few months later, Ms Valera was appointed executive director of Tubigan, recognizing the success of PBSP's work and her expertise in managing water projects. Very quickly her desk has become inundated with project proposals from both the public and private sectors.

Meanwhile, the organization that produced the Pilipino-language handbook for the Unimade Mark II pump — Kabalikang Pamilyang Pilipino — is now carrying out a marketing survey to determine the feasibility of manufacturing Unimade pumps in the Philippines. The study is supported by the Program for

Appropriate Technology in Health (PATH), based in Seattle, USA.

Ms Valera underlines the importance of such initiatives. "If the spare parts of the Mark II or Mark III are not available, then they will end up like all those other handpumps that are just considered junk," she says.

Most handpump technology fails, she adds, because it is too complex for the user who must call in a high-priced professional to repair it. In this regard, Ms Valera is sold on the Unimade pump.

"Among all the technologies available here in the Philippines, it is the IDRC [Unimade] pump that is adapted to the level of the people in the village," she says. "It can be installed, it can be maintained, and it can be repaired by women."

Ms Valera would like to see future water projects focus on women and children. She says women are the "change agents responsible for transferring the proper attitudes about use of water to children."

This article was compiled from submissions by: Mark Timm, a Canadian freelance writer in Southeast Asia; Edison Dy Ong, a Manila-based freelancer who writes about science and development; and Gerry Toomey, Reports Associate Editor, reporting from Kuala Lumpur and Manila.

WOMEN IN CONTROL

Under the IDRC-supported handpump project in the Philippines, village organizations were involved from the very start. They decided on the best location for the pumps, learned to maintain and repair them, and chose trusted community members to serve as project monitors. More often than not, the planners, implementors, monitors, and beneficiaries of the pump installations were women.

"Since the women actually do the cooking and washing, they were made responsible for looking after the pump, its proper usage, and regular cleaning," explains Mediatrix "Peanuts" Valera, leader of the project.

In one case, the women, realizing the value of safe water, "contacted the Department of Health to visit their pump and chlorinate the water. Later, following the instructions, they did regular chlorination on their own."

Participants' behaviour, however, was not always driven by scientific reasoning. In one instance, recalls Ms Valera, the drillers were forced to transfer to another site when a project participant expressed a "superstitious belief that the drilled hole in that area would never yield potable water."

The reason for her belief? A blackbird had flown across the sky while the well was being drilled.