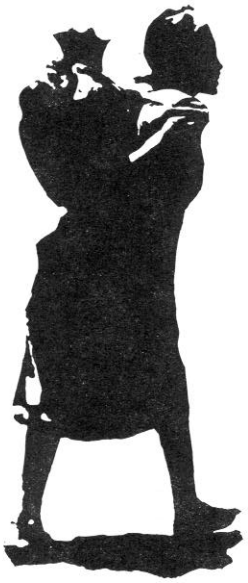

Water technology — there must be a better way

David Henry

David Henry is Assistant Director of IDRC's Health Sciences Division. This article is based on a paper he presented to a workshop on "Water Related Problems in Developing Countries," organized by the Scandinavian Institute for African Studies. The theme was struck when he told the participants: "If the airplanes in which we travelled to this meeting had the same failure rate as most of the technology that has been applied in the last decade in rural water programs, 50 percent of us would not have reached our destination."

"Weapons determine tactics, tactics do not determine weapons". So said Hannibal about war. It could equally well be applied to describe some of the conceptual problems that exist in the field of rural water technology.

At present there is a strong trend among international and bilateral organizations to produce grand strategies for meeting the water problems in developing countries. The problem with these grand strategies is that they are often based on limited knowledge and experience on the ground. This confusion is compounded by the fact that both the tactics and the weapons for implementing the strategy are inadequate.

Looking at the past 20 years, we see that the major impetus for development agency involvement in the rural water field came from severe droughts, first in India in 1967 and then in the Sahel. It has been, in many respects, a response to a crisis situation, resulting in the injection of some very sophisticated capital-intensive equipment and expertise. From my observations I would suggest that the return on these investments has been very low, not only in purely economic terms, but also in response to the basic question: "Are these water systems producing any water?" If so, how much, for how many, and at what cost?

Many of the program officers in bilateral and international organizations who are responsible for country programs admit that there is a great weakness in the planning and field implementation of water projects. However, they are quick to point out that this is because their performance is often judged on the basis of the financial magnitude of projects rather than on the quality and effectiveness of the programs. Also inherent in the process is a heavy bias towards sophisticated equipment. It is far easier, for instance, to deal with a program requiring $3 million worth of drilling equipment than it is to assist a country to plan and design a water project based on local labour and a blend of technology that can be sustained by the local economy.

We must realize that many of the people engaged in rural water projects in developing countries are products of highly structured and specialized training programs, designed to produce engineers and technicians whose role is to plan, implement and maintain urban water treatment and distribution systems in industrialized countries. This background, when transferred into the extremely different environments in rural areas in developing countries, often leads to the imposition of a technology that has little relevance to the local situation and cannot, in most cases, be sustained by the local people after the expatriate engineer has departed.

When it comes to water supply, rural people have the cards stacked against them. They are on the fringes of the formal political power structure and do not have a revenue collection system through which payments for both capital and operating costs of rural water supply programs can be collected. This situation does not appeal very much to lending agencies. But the observation that rural populations do not produce revenue is not only naive, it is totally wrong. Developing countries have predominantly agricultural economies that stand or fall on the production of surplus agricultural products for export. Not only that, rural areas feed the cities and, in one country, a study showed quite persuasively that the villagers are subsidizing major urban water programs.

One of the most glaring weaknesses in the rural water technology discussion thus far has been that women have not been encouraged to participate in the dialogue. Women carry almost all the water used for domestic purposes and in many cases, spend more than half their time doing so. This is a tremendous waste of time, energy and resources. While it may not be possible to put a monetary value on the time and labour saved when water is made more accessible, one can say with assurance that until this obstacle is overcome, it will be difficult for rural areas to achieve a significant breakthrough in agricultural production.

Another limitation within international and bilateral institutions is the tendency for general program managers to take refuge behind the statement: "I am not a technical man". It will become increasingly necessary for the generalist to acquire a much better understanding of the technological implications of the decisions that are being made.

The best definition of technology for these purposes is "the totality of the means employed to provide objects necessary for human sustenance and comfort". It is complex blend of social, technical, economic and political forces. In many cases, the technology problems we are facing can be traced back to the very limited perspective that many people have used in defining the term.

An expatriate technician in Africa recently described his work in the appropriate technology field as being primarily involved in "downgrading obsolete technology so that it will fit here". I regret that my observations in the field indicate that much of what is being described as intermediate or appropriate technology falls into this category. No criteria or objectives are defined for the research, no performance criteria are established for the machines being produced, and no critical evaluation or field testing is carried out.

"Who selected this technology?" asked a colleague after he heard a description of the problems being encountered with conventional manual cast-iron pumps in a country where reliable estimates indicate that 80 percent of the 50,000 wells in drought-prone, hard-rock areas were not producing any water because the pumps had broken down. A dictionary defines "select" as "exclusively or fastidiously chosen, often with regard to social, economic or cultural characteristics." The only reply I could give to his question is that no-one really selected the technology. It was grabbed from the inventory of machines most familiar to the engineers in the field.

Being wrong is a creative part of the learning process and we have a great deal to learn from the experience of the last two decades. But do we have an effective learning situation? As things now stand, the best information is carefully stored away in confidential files or even more inaccessibly in people's memories. Very little useful information has been published and it is unlikely that much more will be generated until there is a declaration of a "freedom of information act" in the rural water field. The time has come for everyone to admit that the last two decades have been largely experimental and that many of the experiments have been less than successful. If we can all agree that we are in the same leaky boat, we can begin to work out a system for problem-solving.

One of the most essential tools will be an effective system for the generation, collection and dissemination of information. Information in itself is silent, however. It is the use to which it is put — inferring, interpreting, projecting, analysing and decision-making — that is important. The development of an effective system for conveying the information to policy-makers and planners who are allocating scarce resources in the water field is one of the most challenging tasks facing those who are concerned with improving the situation.

Based on our observations of the shape of the past, IDRC has decided that resources must be allocated to solving some of the basic problems in the rural water technology field. Some of the basic criteria for our programs are: my technology must be capable of fabrication, as far as possible, within the developing country: it must be reliable, have a reasonable cost, and should be maintainable by the villagers. It is not a matter of designing technology *for* traditional society, but designing technology *in collaboration with* traditional society.

Getting this technology into the marketplace after the design has been tested and optimized presents great difficulties. Opinions vary as to the most effective way to do this. Some contend that the industrial sector has very little to contribute to the development of more appropriate technology for developing countries. Others feel that, with some encouragement, industry can make a significant contribution.

While our major emphasis should continue to be to encourage the development of local capacity for technological innovation, we should not dismiss the potential role of the industrial sector which already plays significant role in the application of technology in the rural sector.

An OECD publication states that, in 1975, $5 million were spent worldwide on all research and development for appropriate technology; $60 billion were spent on developing new technologies for industrialized societies. It is clear that more money must be provided, but that is only part of the solution. More effective mechanisms for the allocation of this money must be devised if it is going to be accessible to the innovative people in developing countries.

We don't fly in airplanes that have a 50 percent failure rate. Villagers don't want machines that break down and cannot be repaired. The challenge before us is to establish a system that will produce machines that will make poor people more productive — machines that will work, will last and are affordable. In developing this system we must ensure that the villager becomes an active member of the research team. For it is the villager who is the focal point of all this activity, and ultimately it is he who will judge if we are making a serious effort to solve his problems, or if we are merely continuing to tinker with his future. □

New Publications

Rural Health Needs, Moin Shah, Mathura P. Shrestha and Marilyn Campbell, editors. Published April 1978, 64 pages, IDRC-105e.
The Nepal Health Manpower Development Research Project began in 1973 to collect information useful for health planning and the development of training programs. In October 1977, representatives of five other Asian countries were invited to a seminar to share their experiences in health care delivery and learn of the Nepal project. This report of the seminar summarizes the results of the studies carried out in one district of Nepal, presents country papers from Nepal, Afghanistan, Sri Lanka, Thailand and the Philippines, and contains an annotated bibliography and list of participants.

Biogas Technology in the Third World: A Multidisciplinary Review, by Andrew Barnett, Leo Pyle and S.K. Subramanian. Published June 1978, 132 pages, IDRC-103e.
Biogas technology represents one of a number of village-scale technologies currently in vogue among governments and aid agencies. Because the technical and economic evaluation of these technologies has often been rudimentary, the IDRC commissioned this "state-of-the-art" review to form a basis for further discussion. The book's three chapters deal respectively with the technical aspects of biogas production, a social and economic appraisal, and practical field experience in six Asian countries.

Publications, 1978.
This up-dated IDRC publications catalogue contains a complete list of monographs, technical studies and audiovisual productions produced by the IDRC in English, French and Spanish as well as a list of forthcoming publications.

Information Retrieval and Library Management: An Interactive Minicomputer System, by Faye A. Daneliuk. Published May 1978, 16 pages, IDRC-TS14e.
This booklet describes the IDRC's minicomputer-based bibliographic information processing system. Developed by the Centre over the past two-and-a-half years, the system was designed to meet the needs of many developing and developed countries for a low-cost system that will enable them to participate in international science information systems.

For information on these and other IDRC publications see announcement on the back cover of this issue.