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POPULATION AND HEALTH SCIENCES

WILL IT WORK? WILL IT LAST? CAN I AFFORD IT?

The problem of providing a reliable year-round supply of safe water to rural populations is one which today directly affects one billion people. Discovering possible solutions will be a complex process, since the situation varies dramatically, not only among countries, but from region to region within countries. However, one part of the water equation that is common to all developing countries is technology.

The best place to get a "fix" on the nature of the problem and the limits to present technologies is at the village level. Villagers may have to spend up to half a day carrying drinking water from the nearest source. It's likely unsafe, but they all have access to water of some kind. When we talk about rural water programs, we are talking about the delivery of safe water for 365 days a year.

In defining research priorities for rural water supply the successes and failures of some of the major interventions that have been made in the rural water field during the last ten years must be analyzed. The objective of most of the interventions was to supply reliable safe water to rural populations living in drought prone areas, where access to water was very difficult. During extreme droughts the traditional sources, hand dug

wells, rivers and ponds dried up, and the solution to the problem was beyond the economic and technological resources of the community itself. This situation prompted governments, and international and bilateral donors to implement and assist large scale rural drinking water programmes.

A brief look at the last decade of experience of the larger rural water programmes, reveals a situation which is less than inspiring. In one Asian country, for example, where about 50,000 wells have been drilled in villages in hard rock, drought prone regions, an estimated 80% of the wells are no longer producing any water. These 50,000 wells represent an investment estimated at 40 million dollars, and are intended to serve a population of 35 to 40 million people. In West and East Africa the same story repeats itself, with failure rates of up to 90% reported by some countries.

What is wrong? If you ask a villager, he will likely show you a rusty piece of machinery, sitting on top of a pipe in the ground.

The machine was designed over 100 years ago and except for some minor modifications has not changed much since. It is called a hand pump. The villager does not think it is a very good piece of machinery, and he is right.

The problems in rural water programmes are not solely technological. There are significant managerial, financial and sociological dimensions to the problem. However, until there is some improvement in the technology, the other three dimensions will be very difficult to deal with. At the present time we are confronted with a situation which is analagous to designing

a public transit system, where the choice of technology is limited to 1920 Ford Model T's.

For the sake of this discussion, let us assume the most feasible technical and economic solution to the water problems of rural populations will be to tap underground water, usually by drilling. Few of these villages will have access to electricity. The experience with diesel and petrol powered village pumps has not been good in most developing countries. It is difficult and sometimes impossible for the villagers to meet the operating and maintenance costs, and if something breaks down they find themselves at a long distance from the service and spare parts supply line.

The universal, and most reliable sourceof power for extracting drinking water from the ground in rural areas, is still people. The question is, is it possible to develop a hand pump, which is reliable, and can be manufactured at a price villagers (individually or as a community) can afford.

Most research that has been done to-date in this area has generally lacked a sound scientific and engineering research base and has had very little input from social scientists. For example, a large American research group was commissioned by a bilateral donor to produce an improved design for the conventional hand pump. The design was produced and tested under laboratory conditions. The testing consisted of operating the hand pump for one million strokes under laboratory conditions. Subsequently someone else doing some research at village level discovered that a hand pump under typical village conditions was subjected to between 5 and 9 million strokes per year. This reveals a rather striking gap in the research methodology. The pump referred to here has not solved any village water technology problems!

The observation of The Director of one of the largest developing country scientific and industrial research organizations,which is conducting research in the rural water field, reveals an interesting new dimension. After reviewing developments in his organization, he commented that we should not overlook the potential contribution that industry in both public and private sectors, can make to the solution of the rural water problem. At some point it will be necessary to apply manufacturing technology to the problem, and the sooner a dialogue is opened with the industrial sector the more likely that significant developments will be initiated in improving technology.

One of the other limitations to the water discussion thus far is that it has been confined mainly to public health engineers with a fairly strong urban bias. Other disciplines, particularly hydrogeologists, agricultural economists and engineers could make a useful contribution. A recent review of ongoing irrigation research projects indicates that many of the approaches and research methodologies that are being applied to irrigation, could be applied to rural drinking water problems. After all, we are dealing with agricultural communities, and the technological, social and economic dimensions are basically the same.

Another very important aspect of the rural water scene is leadership!! Water cuts across a very wide range of interests and disciplines. It will be necessary to identify people, who have a basic interest and understanding of rural communities, who can relate to a wide range of skills and organizational problems, and articulate this complex range of issues in terms that can be understood by political leaders, administrators, technicians and most importantly, the villagers.

In order to improve the delivery of rural water and sanitation programmes an effective system for exchanging information will be needed. Some of the best information on rural water and sanitation has never been published. This is probably because the people who are doing the work in the field are too busy to write, and the academics have not been very

interested in rural water. IDRC is now assisting the development of an information system, and it is expected that in two or three years the major weaknesses in the information field will be overcome.

Efforts are underway to identify groups of researchers in Africa, Asia, and South America to undertake research in the field of rural water and sanitation and it is likely that within the next twelve months a few research projects on a modest scale will be initiated. In the development and implementation of these projects, two crucial points will be carefully examined: firstly that unscientific tinkering with technology is not clothed in research jargon, and secondly that a rigorous examination of the economic implications must be made to ensure that the villager is not priced out of the water and sanitation technology market place.

In the final analysis, the dictum of the villager, "WILL IT WORK, WILL IT LAST, AND CAN I AFFORD IT", will prevail.