


Kari Homanen and Kyber
**Finnida activities concerning handpump applications
in rural water supplies**
**FINNIDA ACTIVITIES CONCERNING HANDPUMP
APPLICATIONS IN RURAL WATER SUPPLIES**
General

The Government of Finland has assisted three countries in the development of their rural water sector. The oldest project is in the Mtwara and Lindi Regions in Tanzania, it started in 1972 and it is called the Mtwara-Lindi Rural Water Supply Project.

Projects of a similar type were started in Sri Lanka 1980 and in Kenya 1981.

Since the projects in Sri Lanka and Kenya are still in their early stages the following presentation concentrates on describing experiences gathered from Tanzania.

The total cost of Project implementation from 1978 to the end of 1984 was about 13 million US\$. Of this about 42% has been spent on the construction of handpump wells.

Handpump Wells

The production of handpump wells has been about 250-300 wells/year totalling about 1780 wells and serving about 400,000 people.

Wells are either dug wells (dia 1.0 m) or tube wells (dia 6" or 8"). Dug wells are dug by tractor excavator or by hand. The water level is normally less than 4 metres.

Tube wells are drilled by the hand auger method. Water level is normally less than 8 m.

All wells are equipped with the Finnish made NIRA pumps.

The villagers are participating in the construction of hand pump wells as follows: the information on possible well sites is collected by interviewing the villagers during the survey. The villagers are informed about the well construction in village meetings. In machine dug and auger well production the villagers provide assisting labour.

Since July 1983 no payments have been made to the village for providing the labour. Earlier villagers were paid 500.- Tshs per well after completion. The change has caused some problems especially near those villages which have received payment before. Hand dug ring wells are constructed independently by villagers and the project provides only supervision (one foreman) and materials. After the construction has been completed, the whole responsibility for hand pump maintenance is gradually handed over to the village.

Operation and maintenance of handpump wells

The maintenance of handpump wells has been carried out from the beginning of the project until recently by mobile maintenance units. Every well has been visited on average three times a year. With this degree of maintenance 85-90% of the handpumps are always in a working order. The maintenance costs (Project overheads excluded) /well are about 45 US\$ a year, of which about 20 US\$ is used for spare parts.

The Project started in June 1983 to create a new village level maintenance system for the operation and maintenance of handpump wells. It consists of three levels:

- 1st level (the most important one)
village well caretaker
- 2nd level district maintenance centre
- 3rd level regional maintenance centre

The village well caretaker is trained by the Project either in a one-week training camp (villages with existing wells) or together with construction and pump installation groups during construction of new wells. He or she is responsible for daily maintenance of the handpump, cleaning of surroundings of the well, repair of the handpump and collection of spare parts from the district maintenance centre. The district maintenance centre also gives technical assistance to the well caretaker, if needed. The regional maintenance centre acts as a coordinator and distributes spare parts to district maintenance centres.

Villages have to buy the tool kit needed for the maintenance of the handpump, but spare parts are still provided free of charge by the Project.

The well caretaker is responsible to the village government when district and regional maintenance centres are within the Maji (Ministry of Water and Energy) organization.

The Project has already handed over the maintenance of the handpump wells in 70 villages, 4 district maintenance centres are functioning but the Project still acts as regional maintenance centre.

Judging from follow-up records, the village level maintenance system is functioning well. The number of broken handpumps has been only slightly higher than with the centralized system of maintenance.

There are still problems to be solved. The main problem has been inability or reluctance of the village governments to pay compensation to the well caretaker. However, we have a strong belief that the village level maintenance system will be the cheapest and also the most effective maintenance system for handpump wells, at least in our Project regions. Of course, a smooth system cannot be created in one or two years, the system will need careful follow-up, readiness for changes and strong support from both the Project and from the Government of Tanzania.

Development of handpump technology

The Project first became involved with the World Bank handpump test programme in March 1983. Since then there has been continuous discussion between the World Bank experts and the Project as well as within the Project staff concerning handpump technology.

As a result the Project started experimental work with a direct action handpump late in 1983. The aim was to develop a pump to be as simple as possible, to use as many local skills and materials as possible and that the maintenance can be done using as few tools as possible.

The actual dismantling work can be done solely by removing bolts from flange and cap. The cap can be opened, the inner pipe with wooden bushes can be taken away and the piston rod can be lifted up along with the piston.

The pumps have been made by skilled local workers using mainly imported materials and for the cylinder we have used the cylinder of the normal NIRA pump.

Six months of field testing have shown so far that the wearing of wooden bushes is fairly fast during the first weeks but after creating considerable clearance the rate of wearing is much slower. Villagers have agreed that the pump is heavy to use but has a good yield and so most users are satisfied.

The manufacturer of the NIRA pump has also developed a direct action pump, called NIRA AF-85. The stand pipe is made of mild steel, the hand and upper part of the pump rod of stainless steel and the rest of different kinds of plastic materials. The drop pipe and sealed pump rod are of high-density polyethylene pipe and piston, foot valve, etc. are of polymer plastic. The pump is designed so that 70% of the work needed is used during the down stroke and 30% during the up stroke, and so pumping is quite easy down to 10 metres.

Health education and sanitation

The Project has prepared, in co-operation with local health authorities, a poster series and a booklet about water and health. Final decisions on how to continue have not yet been made but most obviously local organizations will take the leading role and the Project will provide only materials and general assistance.

Sanitation aspects had not been originally included in the Project. Last year at the request of FINNIDA a proposal was prepared by prof. Albert Wright for a sanitation programme. Final decisions have not yet been made, but it is likely that a pilot scale sanitation programme will be implemented in 1985 consisting of testing suitable latrine designs, testing construction methods, evaluating construction materials and the construction of demonstration latrines in some selected villages.