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**Rural water supply development and handpump**  
**use in Kwale District, Kenya**

The Government of Kenya has made considerable development of water resources with the aim of improving the living conditions of its urban and rural populations. In the late '70s, it was noted that simple technologies, and in particular, the handpump offer advantages in the development of relatively shallow groundwater for rural populations due to its low capital investment and running costs. The development of groundwater using simple methods is widespread in Kenya and is being implemented by the Government, non governmental organisations, donors and other institutions. All these activities depend on community participation to a large extent. Kenya is well known for her traditional community "Harambee" efforts in all spheres of development.

This paper gives details of a handpump project on the coast of Kenya, which aims by its approach to provide a water supply that is maintainable in the long term. Basic features of the project are community ownership of pumps and hence community responsibility for maintenance, and the development of a locally manufactured pump that can be maintained at village level.

The South Coast Handpumps Project in Kwale

In 1981, preparation of this project was initiated as part of the Government participation in the 'International Drinking Water Supply and Sanitation Decade'. On initiating this project, the main objective was a simple yet dependable water supply system incorporating the support and involvement of the community to be served in its execution. The other objective was to field-test about eight types of handpumps and identify those that are suitable as shown by the users; and as a follow-up, to establish local manufacture with designs incorporating the community ideas.

The South Coast area of Kwale was chosen because it has a shallow water table, usually less than 50 m, and due to the need arising out of widespread health problems related to waterborne diseases notably bilharzia, cholera and typhoid. Walking distances of one to two kilometres are commonly found in the area.

Actual drilling operations began in earnest in September 1983. With its two small, cable-tool rigs, the project has constructed sixty

boreholes fitted with handpumps. In addition, ten open well have been protected and fitted with handpumps. All these are distributed in an area of 300 km<sup>2</sup> with a population of about 50,000.

This project is implemented by the Ministry of Water Development which also meets about 35% of its cost. The Swedish International Development Authority provide the other finances, channelled through UNDP. The UNDP/World Bank Rural Water Supply Handpumps Project provides management support while a local NGO (Kenya Water for Health Organisation) undertakes community liaison and training.

The direct cost for one water point (borehole) calculates slightly above US \$1,000. Other indirect costs such as operation and maintenance, staff costs and community contribution in labour and materials are about twice as much. Each water point serves on average about 200 people.

Project Approach and Activities

Before actual work began, a water resource survey was carried out to collect and analyse relevant hydrological, hydrogeological, population and population distribution data. Existing water sources were identified, including about 100 open wells. The water table was found to be generally less than 30m. below ground level in the project area. Water samples were collected for both bacteriological and chemical tests. The results showed water of generally favourable mineral constituents although often contaminated. The need for protection was therefore real. New sites for borehole drilling were identified with sufficient care being given to water conservation measures and coiding chemically unacceptable or possible polluted sources. In most cases the sites were such that the villagers had easy access to the water source.

Community Involvement

Initially there was understandable reluctance from the community as some believed (some few still do) that the end result would be failure as was the case with similar handpump projects in the past. A socio-cultural study was initiated when this was realised. The study involved:

- a) Present status of water supply and sanitation in the area.
- b) Community organisation and participation

in self-help programmes with special emphasis on self-help groups.

As the project progressed, the community became the centre of nearly all activities. In this way, major obstacles were overcome, including issues such as land ownership, community institutions for managing the waterpoint, handpump ownership and responsibility for pump maintenance. The activities which secure the water point may be summarised thus:

- a) An extension worker who is constantly in touch with the local community receives and forwards their request.
- b) The liaison officer together with the siting geologist then approach the community which may be an existing organised group or one with no definite organisational structure. In the latter case, a committee is formed.
- c) The villagers (committee) are requested to identify the site with the hydro-geologist assisting.

site on public utility land - OK  
site on private land - the  
community decides.

Once decided by the community with the consent of the landowner, the project takes up the issue with relevant authorities to see that such an agreement is embodied in the landowner title deed. This arrangement is seen to be the most practical and satisfying to the community and landowner because, by a community decision, the community gains right of access to the well and the landowner gains a nearby water source.

#### Construction Stage

Once the site has been agreed upon, the drilling which is done by a specialised crew commences. The drilling which is carried out through sands, coral limestone and sandstones with clays is done carefully, formation samples being collected and its characteristics recorded. Once the required depth is reached (normally between 30 and 50 m), completion casing is set in place and then well graded sand of the required quality is inserted. When this is done properly, the borehole is certainly sand free ensuring the well's long life and prolonged pump life. The well is then developed as necessary and tested for its productivity. At the end of the test, water samples are collected for chemical and bacteriological analyses. All these activities take about two weeks.

During this period, the community may have done some or all of the following:

- a) Clearing access to the well location.
- b) Providing water for drilling.
- c) Collecting construction materials

e.g. sand, stones, etc.

When acceptable results of the water analyses have been obtained, the pump pedestal, washing basins and drainage system are constructed and the handpump installed.

#### Other Community Activities

During this time, other government community workers, e.g. Public Health Technicians, Community Development Assistants together with Project extension workers are organising communities to:

- a) Be aware of the benefits of clean water to health, hygiene and general well-being (as a matter of fact, some villages have reported improved health among their children since they got the water point).
- b) Prepare small vegetable gardens which will use the waste water.
- c) Prepare and organise themselves to keep the pump surrounding clean and remove stagnant water pools.
- d) Raise a modest financial contribution (normally contributed on a weekly or monthly basis at about US \$0.25 per month per family). Contribution among twenty villages begun in September last year amounted to more than US \$400 (see below) by end of February 1985.

#### Planning for Maintenance

As mentioned earlier, operation and maintenance require substantial inputs and the success of rural water supplies will depend largely on how well this is prioritised. The project has taken the following steps:

- (i) Every water committee is being encouraged to collect funds on a regular basis so that the funds will be available for hire of artisans and purchase of spare parts in case of pump failure. The response has been fair, about 50-60% of the eligible contributors actually contribute without any external duress.
- (ii) The project at its start employed local people to install handpumps and carry out above ground construction. This team has developed complete skills in handpump installation, removal, repair and maintenance. The project intends to provide these men with repair tools and pump manuals so that the local community can hire them when the project team has left.
- (iii) Several local companies are now manufacturing pumps and pump components. Some of these are institutions aided by Government to spur industrialisation, for example Kenya Industrial Estates and some regional Institutes of Technology. Large scale production and a proper distribution network have not yet been established

and this certainly is a major challenge for this year.

- (iv) The project is formulating an effective training programme. It has not yet been possible to introduce some of its aspects due to the diverse nature of pumps and the handpump testing programme; nevertheless training of trainers who will then carry out training at the village level is now under way. Also villagers have generally been called upon to observe and sometimes participate during pump installation and removal for repairs.
- (v) All the different types of handpumps installed are routinely monitored by the UNV (UNDP/World Bank) handpumps engineer for their performance, durability and acceptability by the target users. Data is being compiled on repairs carried out on each type of handpump, the frequency of failure and which part actually failed. Our results show that out of twenty five (25) pumps installed a year or so ago, seven have not had any breakdown, while a maximum of three repairs were carried out on the others. This monitoring, together with developments in local pump manufacture, should allow selection of the most suitable pump and standardisation to one type of handpump in the near future.

It is necessary to emphasize that the problems of operation and maintenance may not be overcome easily. The ideal handpump may probably never materialise because of the conflicting requirements - a cheap sturdy long-lasting easily-maintained piece of equipment! The deciding factors may be:

- a) Acceptability by the users and easy maintenance.
- b) Local manufacture.
- c) Constant source of spare parts and an effective distribution network.
- d) Sufficient training and motivation of maintenance crew at the village level.

The above aspects require action in a vigorous manner if the handpump is to succeed.

#### Future Plans

Though the present project had a lot of flaws in its initial approach and some still exist, a reasonable acceptance by the target community has been generated. Its success and the degree of community participation have opened up chances of its extension to other areas of Kwale District where need for water is greater. A programme is now planned which will be district based, in line with recent Government policy of delegating more authority to the districts for rural development. The districts have been strengthened with the necessary

manpower and facilities to cope with these enlarged activities. The District Focus for Rural Development policy rightly sees long term rural development success depending on the participation of local populations and concentrates on the fact that there is a high degree of cooperation among and between all people involved in development in any one particular district. The strategy is based on the principle of complementary relationship between ministries with their sector approach towards development and the district with its integrated approach to addressing local needs.

The proposed Kwale District Community Water Supply and Sanitation Programme will centre around community based participation and will involve target communities that have expressed desire and shown commitment to participate in the programme's activities. It is proposed that this commitment will be formalised in terms of Community 'Water and Health Groups', registered with Government, which will be responsible for the water points and sanitation facilities installed under the Programme. It is felt that this approach will increase the chances of achieving one of the basic aims of all water supply and sanitation projects: long term and sustainability.