Introduction

Water is a basic requirement for human as well as animal and plant life. People need water for drinking, preparing food and for sanitary purposes. In Africa and many other parts of the third world, there is a manifest lack of access to clean potable water with a consequent deleterious effect on community and individual health. The World Health Organisation (WHO) in 1980 estimated that 30,000 people were dying everyday from diseases attributable to lack of good water and sanitation and over 70% of the world’s rural populations lacked access to safe water supply.

The need for safe water for domestic use was recognised in the plan of Action of the United Nations World Water Conference (1977) and motivated the launching of the International Drinking Water Supply and Sanitation Decade (1980–90).

Figures available show that in the first half of this decade (by 1985) significant progress was made in improving the access of third world people to safe water (see Table 1 below).

From these figures, it was clear that progress made in Africa was not as good as in other regions. Hence it is clear that the decade target of full coverage was not going to be met. It is estimated that half the population would remain uncovered at the end of the century. (Ref. 1).

The plight of the rural dweller can be seen from this table above and the following figures. In 1985, 870 million people lived in urban areas, while 116 billion people lived in the rural areas, yet approximately, 22% of urban dwellers were uncovered while the corresponding figures for rural households was 64% (Ref. 2).

Thus, inspite of the fact that the past 30 years have seen great efforts in the area of water resources development, with the construction of water projects of large magnitude, there is still under-provision of water for domestic use. Sadly, inspite of the vast amount of money channelled into such schemes, the people, particularly the rural ones, have not been able to get the projected benefits because of the plague of broken down and badly functioning facilities. Project maintenance has been a continual problem.

Table 1 Water Supply Coverage 1980–1983.

<table>
<thead>
<tr>
<th>Region</th>
<th>Total Population (millions)</th>
<th>Population served</th>
<th>Population served</th>
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<tr>
<td></td>
<td>1980</td>
<td>1983</td>
<td>Mills</td>
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<td>Region</td>
<td>Total Population (millions)</td>
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<td>1980</td>
<td>1983</td>
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<td>Africa</td>
<td>334</td>
<td>356</td>
<td>76</td>
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<tr>
<td>Asia/Pacific</td>
<td>1064</td>
<td>1109</td>
<td>277</td>
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<tr>
<td>Latin America</td>
<td>124</td>
<td>126</td>
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in water provision schemes and a major cause of their unsustainability.

Nevertheless, the problems surrounding lack of water have reached a critical state and taking into account population growth, it is clear that there will be greater need for new water supply projects in the future. These projects must be environmentally sound and sustainable.

Obstacles to Sustainable Water Resource Development.

In Africa, the major obstacles to sustainable water resource development must be poverty and dependence. Property has resulted in a situation where governments are confronted with short-term problems such as malnutrition and disease, high infant mortality, illiteracy and chronic unemployment. Faced with these problems governments and countries manifest the obstacles listed by the World Bank as (1) fragmented sector policies due to competition for donor funding; (2) weak or non-existent institutions and inadequate coordination among sector agencies; (3) lack of adequately trained and motivated manpower; (4) use of inappropriate technologies, generally provided by donor agencies; lack of knowledge of lower-cost technologies; (5) lack of community involvement, fostered by donor planning of "assistance"; (6) inadequate operation and maintenance, attendant upon lack of local knowledge and community involvement; (7) problems of resource mobilization and utilization - compliance with donor requirements.

Many systems for supplying communities with water, built with foreign aid, lie abandoned all over Africa because they simply cannot be maintained. A fundamental change of approach was called for which could involve the community in the management of their water supply. This is recognised in the following statement:

"Lasting health and economic benefits for the rural and urban-fringe populations e.g. Africa can be achieved through increased community management of water supply and sanitation systems based on proven low-cost technologies."


Solutions

New CMS Systems

It is now recognised that successful water supply programmes must contain technology and institutional/organisational support elements. This will ensure that each community recognises the benefits of the improved supply, can afford to maintain the equipment as well as having the necessary skills, spare parts and other materials to sustain it.

This approach calls for community involvement in design, implementation and financing of planned improvement. It also provides for the selection of technology based on the resources available within the community and maximum involvement of local industries in the supply of services and materials needed in the construction and maintenance of water supply technology. Implicit in this new approach is the ownership of the means of producing water by the community (i.e., privatization of water supply) and the maintenance at community level of this means of production. This is a concept which has been labelled village level operation and maintenance (VLOC) (Ref. 3).

There is evidence now from various countries that schemes developed by the community stand the greatest chance of being maintained in working condition. But the success of any such scheme will be based on the selection of appropriate technology to meet (1) financial resources (2) physical resources and (3) organisational resources. These resource issues have in many cases been the cause of failure of many community water systems in the past. A case in point is the introduction of diesel pumping in rural Nigeria. In this project, deep drilled wells were equipped with submersible electric pump, a diesel generator to pump the water into a storage tank, typically holding one day's supply of water only.

The diesel generators were housed in small buildings guarded against theft and vandalism, by hired security men. These were augmented by operators who were responsible for operating the generator and preventing water wastage by the community. Major repairs and maintenance were carried out centrally by government agents. This meant long delays and increased costs of maintenance. Communities were unable to find personnel to carry out the repairs needed. Furthermore, because community involvement
was minimal, communities were only to supply
diesel for running the pumps, there was no
motivation for them to ensure their continued
functioning.

Clearly, assessment of organisational
resources at national and community level was
inadequate in this case. As such, the
decisions reached on the duties of each group
were inappropriate. It has become clear that
reliance on national organisations for
maintenance support placed logistic burdens
on central government which it was unable to
meet over the long term. Over the long term,
self reliance at the community level is a
more workable alternative.

A reported successful example of
village/community level management of hand-
pump based water supplies comes from Burkina
Faso and was modelled on principles developed
by experts of the ACP and SRC at their
consultative meeting in Bamako (Mali) (1979)
- i.e. the transfer of responsibility for
operation and maintenance of water points to
users. The aim of this particular project
was to set up a system entirely independent
of outside support (Ref. 4).

Community participation in this project began
with the direct involvement of communities in
deciding which technology to use. The
community had to select between dug wells
without handpumps and drilled or dug wells
with handpumps. Then, the community was
involved in selecting well sites as well as
collecting contributions to finance the
superstructures. Finally, the community
members met the cost of hand pump
installation and maintenance. The water
scheme was theirs.

The Role of NGO's in Community Water Supply

Most communities in developing countries need
to be assisted in the construction and
maintenance of water supply schemes. The
different possible arrangements for water
resource management have varying capabilities
and limitations. The best technology for any
given circumstance will depend on the
prevailing situation. Sustainability based
on community resources is a vital design
parameter if rural water supply is to expand
without being a continual drain on scarce
financial and human resources. Thus in
deciding on the first step, communities must
be assisted through an assessment of the
resource demands of each technology option
and compare these with the resources
available to the community.

Given the shortage of skilled manpower in
developing countries, it would be extremely
difficult for them to provide this kind of
service to the numerous communities. This is
therefore an area in which assistance from
Non-governamental and non-profit organisations
may ensure the provision of community water
supply.

Providing Organisational Assistance. NGO's
assistance to the community should begin with
the evaluation of organisational capacity.
In some communities there are already self-
help groups, co-operatives etc which are
evidence of organisational experience. These
groups, where they exist, should be assessed
in terms of leadership, level of education
and skill. Suitable organisations can be
adapted through training and skills
improvement for the purpose of running the
community water system.

In communities, where there are not such
organisations these would have to be created.
NGO's are in an ideal position to assist in
this process and may help the community by
teaching the rules and advantages of co-
operative formation.

Assisting Communities to Access Additional
Resources. One of the major difficulties
which rural communities have is lack of
access to the resources needed for their
development. Because of distance from
cities, illiteracy and lack of means of
listening to radio broadcasts, rural
communities are not aware of the
possibilities for assistance which are
available to them. The establishment of
self-help groups, cooperatives etc is a step
towards bridging this information gap. Once
NGO's have assisted in groups, these groups
can be registered with government agencies
so that they can be supplied with information
NGO's can also link these groups up with
agencies responsible for providing funds for
rural development and credit.

Assisting in the Determining of
Infrastructure Requirements. There are many
technology options in rural water supply
schemes each of which gives a different level
of services. These range from improvement of
existing traditional sources such as cisterns
and rain water jars to drilled deep wells
with pumps. There are many technical issues
which have to be taken into account such as
physical characteristics of the aquifers, the level of service required by the community—the amount of water required per day, the costs associated with the various choices and the benefits. All these must be calculated so that communities can decide the best level of service which they are willing to pay for. This kind of information can only be provided by experts which are in short supply in developing countries. It is therefore suggested that NGO's provide expertise in this regard.

NGO's must in collaboration with communities, establish the demand for water supplies. In previous water supply schemes, External agencies and government planners have often determined water demand and then applied some predetermined quota to set the number of water points required. This meant that the community's needs were not taken into consideration and their sense of ownership and satisfaction with the water scheme was non-existent. The result has been failure of water schemes which the community cannot afford.

In the case of community Handpump water supply in Burkina Faso mentioned above, the weak point proved to be the supply and distribution of imported spare parts. Here again it is possible that NGO's can help communities to purchase directly spares to set up their own stocks, provided the communities are willing and able to bear the costs.

Enhancing Access to Training. It is clear that community members have to be trained if they are to carry out maintenance of their water supply schemes. Having assessed the skills of members of a group to be used in the water schemes, individuals who can be trained must be identified. Then missing community skills can be created through programmes implemented before and during construction.

Qualified trainers from the implementing agency (NGO's) supported by representatives of the manufacturers should take advantage of community interest in project activities to organise demonstration and training sessions.

The Role of Women.

In African and other societies, women have traditionally been responsible for supplying their family water needs. The inaccessibility of water has meant that women have had to trek for miles searching for water. In some cases the time spent stretches to hours, which could have been spent in some income generating activity.

Clearly, women have more to gain from improved water supply and are therefore more motivated to ensure its continued provision. Advantage should be taken of this. Women must be trained to maintain the equipment. Women's groups and co-operatives have been found to be very useful in improving the living conditions of women and children and should be utilized in ensuring continuous improved water supply.

Many women in traditional rural societies are already highly skilled in arts and crafts and could easily be taught to dismantle and lubricate pumps or replace worn parts. The added income which improved water supply would generate by liberating the women to pursue their income generating activities will ensure their continued motivation.

With the problem of out-migration of men from the rural areas and the consequent abandonment of women as family heads, it is now more than ever necessary that women be provided with the skills needed to ensure the health of their families. One way in which this can be achieved is through women's ownership and maintenance of the community's water supply. This will also help to prevent the mass movement of communities which has been partly responsible for the refugee problems currently plaguing Africa.

Finally, it has been said that by educating a woman, you educate an entire community. This is clearly true. A woman who is trained to operate a machine will train her children to assist her, thus ensuring the spread of skills. By this means the number of training sessions needed is over the years diminished and the continuity of services maintained. This must be the cheapest way of ensuring sustainability of Community water schemes.

References


