

Towards a new philosophy on operation and maintenance

by Ato Birru Ittissa

The operation and maintenance of water supplies and sanitation systems has been so badly neglected that many schemes no longer provide the service for which they were constructed.

THIS SITUATION IS the result of two processes, the first and most important being the emphasis on capital construction and expansion, particularly of water services, by developing country governments and External Support Agencies (ESAs). A second crucial factor is the long-standing tradition of some governments and External Support Agencies of offering water and sanitation services as a free social benefit at no cost to the consumer. Investments in the water supply and sanitation sector increased steadily during the Water Decade, 1981-90, because of the recognition and acceptance of the fact that safe water and appropriate sanitation are crucial to an individual's health. Not much attention, however, has been paid to the fact that the sustainability of such benefits will depend upon the correct operation and maintenance (O&M) of these facilities. Even though adequate O&M has been recognized as one of the major constraints to water sector development, there has been no substantial progress in this field over the past ten years. The rural experience has been that where a water supply is provided through point sources fitted with hand-pumps, a high percentage of the facilities not functioning — figures of 40, 50 and 60 per cent are reported. In urban areas, ineffective O&M has resulted in more than half of the water produced in several large cities in developing countries being unaccounted for. In contrast to the high amounts of wastage and subsidized tariffs which are common features in the served city areas, the peripheries remain unserved and are forced to pay a premium for water from private vendors.

The international community sought to focus more attention on this issue through a one-day informal working session in November 1988 at The Hague, which was convened by WHO and assisted by the International Reference Centre for Community Water Supply and Sanitation (IRC), and which brought together representatives of various ESAs. This initial meeting concluded that special consideration needed to be given to the O&M aspects of rural and urban water supply systems. While recognizing that sanitation systems need to be approached in the same way, the meeting considered the O&M problem of the water supply systems as being more urgent. It stressed the need to establish clearly the scale of O&M problems, and for ESAs to support the development of country-level policies and strate-

gies, and for case studies to be prepared to encourage and facilitate exchanges of experiences and related development strategies for improving O&M. A working group on O&M was established and its first meeting, organized by the WHO, was held in Geneva in February 1989, at which a list of key issues were identified and a methodology for joint co-operation adopted.

Subsequently an informal meeting on O&M, co-organized by WHO and IRC and attended by representatives of WASH and the UNDP/World Bank Project, was held at The Hague on 20-23 February, 1990. Its main purpose was to contribute to the preparation of the meeting of the Working Group on O&M which was held at Geneva on 19-22 June, 1990, and was convened by WHO with the support of GTZ and IRC.

Identify the problems

These meetings have resulted in the concrete identification of problems and issues and have proposed desirable approaches to their solutions.



In rural areas a high percentage of handpumps are broken.

Ato Birru Ittissa is the General Manager, Water Supply and Sewerage Authority, Addis Ababa, Ethiopia.



Lack of sufficient funds restricts the programme's ability to buy spare parts and train technicians.

These approaches constitute what will be the new philosophy on operation and maintenance. The deliberation of the February 1990 pre-Working Group meeting at The Hague identified the major constraints which influenced the current O&M situation in developing countries. The meeting described the effect of these issues on the effectiveness and efficiency of water and sanitation agencies, defined the aim of the proposed co-ordination of efforts, and discussed some of the key issues and activities to be jointly implemented. The June 1990 Working Group meeting was able to put these various factors together. The identified constraints and remedial approaches should now be the focus and substance of efforts to improve the O&M of the urban and rural water supply system in developing countries.

Under the three broad headings of Sector Performance, Institutional and Technology Performance, and Environmental Linkages, the Working Group identified the key issues contributing to the poor O&M of water supply facilities as the following:

- absence of data on operation and maintenance;
- insufficient and/or inefficient use of funds;
- poor management of water supply facilities;
- inappropriate systems design;
- low profile of O&M;
- inadequate policies, legal frameworks and overlapping responsibilities; and
- political interference.

The overall lack of data is a significant obstacle to any useful formulation or reformulation of systems and programmes. The kind of data one needs is, for example, the number of systems not working all over the world — a global figure — and information on why these are not working, or what kind of costs are involved for adequate O&M programmes in relation to various facilities in different countries. At the other end of the spectrum, we need data on the well-managed and maintained water supply systems on a global basis, and a breakdown of the costs and benefits of these operations. Another valuable input



Good system design includes a maintenance programme.

would be data on the rates of breakdown of different systems, such as handpumps, gravity systems, and treatment and distribution networks. In the absence of such hard data, it is difficult, if not impossible, to convince decision-makers of the need for and benefits of an improved O&M system.

A second major constraint is the lack of and/or inefficient use of funds. The first restricts activities that are vital to effective O&M — the purchase of spare parts, the training of staff, and the provision of competitive salaries to attract the right people. External Support Agencies have tended to shy away from financing O&M activities, while national governments have accorded it a low priority, directing available cash to what they believe are more crucial sectors. Frequently, where the money is available, it is used inefficiently and contributes to poor O&M.

Poor management

The ineffective management of facilities leads to the wastage of resources, which in turn reduces the viability of the water-supply system. Overstaffing and poor organizational structuring are two major factors in this situation. Another factor leading to losses in revenue is the high rates of unaccounted-for water either through leakage or illegal connections; figures as high as 40 to 50 per cent have been mentioned. A case in point here is the study entitled 'Unaccounted-for water management in Greater Kathmandu' presented at the meeting of the Working Group, which highlights not only the problems of unaccounted-for water, but also the other financial constraints mentioned. Another case study, 'Financing the operation and maintenance of water supply systems: Experiences from the urban and rural water supply sector in Zambia and Malawi' offers further evidence of the lack of funds hampering effective O&M. This second paper also illustrates another issue, which is the unwillingness of the consumer to pay for an unreliable and unsatisfactory service. Evidence in support of the fact that consumers are able but unwilling to pay is surfacing in a number of countries. The failure to establish realistic levels of tariff which are linked to the service available results in diminishing levels of user support and a corresponding reduction in funds avail-

able for O&M, which in turn leads to a further drop in service levels.

Water-supply facilities range from community-owned and operated water-supply systems to government-owned and operated systems. Whatever the scale of the facility, however, ineffective management will render it useless. Some of the symptoms of this kind of management can be seen in inefficient organizational structures, lack of career structure for staff, inadequate salaries, and poor relationships between the users and management. This last feature is particularly true of government-run utilities, with all the negative implications of inadequate feedback and possible confrontations between the agency and the consumers.

Inappropriate system-design will almost certainly result in an inefficient water-supply system. There are, unfortunately, too many of these systems which have been badly designed, poorly managed, and which have used inappropriate technologies. The reasons for this poor system design vary. An ESA may send an unqualified consultant to design the system, or political pressure may result in a certain system, however inappropriate, being favoured. Here again one has to go back to the community that the system is supposed to serve, whether urban or rural, for support in identifying the optimal system. This area of community participation leads to community management and considerable work needs to be done if we are ever to realize the objectives of optimally functioning water-supply schemes in all developing countries.

Low profile

A further problem with the operation and maintenance aspect of water-supply systems is its low-profile, its virtual invisibility when compared to new construction and system extension. New constructions are fairly reliable vote catchers, while there is not much glory to be gained from a good O&M system. Moreover, engineers themselves seem to find new construction more attractive than routine O&M activities.

Because of its low profile and its relatively low status, not much attention has been paid to the need for establishing clear sector policies, compatible legal frameworks, and a clear division of responsibilities and mandates within the O&M

sub-sector. An example of this is the nature of the relationship between the agencies for water supply and sanitation — quite often they have virtually no contact with each other, even though their interaction is crucial to the reduction of disease. We have not been successful in establishing the links between an effective WSS programme, a healthy individual, and an increase in the nation's productivity. Organizationally, one also finds that the approaches of ESAs and national governments differ with regard to O&M; better co-ordination here is an obvious necessity.

The last serious inhibiting factor in successful O&M is that global issue of political interference. When a political decision has been taken to provide free water, the chances of running a self-financing water-supply system are remote. Political interference may also result in inappropriate and wasteful water-supply systems, not only in terms of inappropriate technology but also, for example, in the quality of the facilities constructed. The working group's recommendation therefore makes eminent sense: devolve the responsibility for the management of systems from government to autonomous agencies which will be

guided — technically, administratively and financially — by government guidelines.

O&M principles

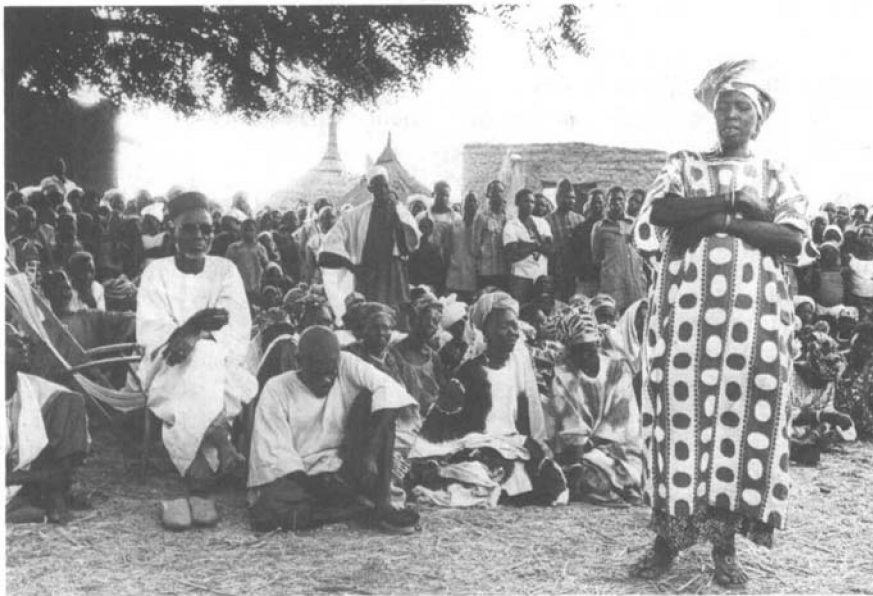
Having defined the constraints to an effective O&M system, the working group then established the linkages between the conceptual and the implementation aspects of a new order O&M philosophy. While outlining the activities which would serve as the vehicles for the theories discussed, the group suggested that these activities be guided by four basic overriding principles for operation and maintenance. These are fundamental to any sustainable O&M activity in the water supply sector.

- Agencies involved in the provision of water should be service-oriented. If water is to be treated as a long-term commodity, its sustainability will depend on the adoption of a sound and cost-effective approach subject to the same legal and regulatory controls as other resources.
- The principle of effective demand must be the normal basis on which water is supplied to consumers. In other words, the community must define the stan-



Good relationships between users and managers are essential.

Christian Aid/S. Gupta



Women are the main users of pumps and must be consulted when operation and maintenance schemes are proposed.

dards of service it is willing to operate, maintain, and pay for in order to ensure adequate public health standards.

- The principles of good business practice must govern the establishment, operation, and maintenance of water systems. While forms of management may vary depending on local realities, the responsible agency will be autonomous but will still be guided by the government's guidelines. More important, the agency will be fully accountable to its consumers.
- New programmes must seek to establish the importance of the sanitation sector and establish closer links between water supply and environmental sanitation.

While emphasizing these principles, the group does recognize the legitimate concerns of national governments to satisfy the basic needs of the disadvantaged segments of their populations. These concerns could take the form of services at 'lifeline tariffs', minimum tariffs, or temporary subsidies.

Action plan

Within the framework of the principles I have just mentioned, certain activities were identified for implementation. These fall into four broad groups:

- Enhanced profile of operation and maintenance at global and national levels.
- Management improvement.
- Data collection and operation and maintenance monitoring.
- Policy formulation, collaboration and co-ordination.

The activities under the first

group include activities such as: the preparation of a global position paper on O&M aimed at decision-makers in national governments and ESAs to prioritize O&M at the highest level; the holding of workshops, seminars and conferences at the national and other appropriate levels to raise awareness regarding O&M; the maximum exchange of experiences regarding O&M to raise the profile of O&M among professional associations, training establishments and other organizations; and the preparation of guidelines to be issued by ESAs to engineers so that O&M concerns can be included in system designs.

Proposed activities relating to management improvement include the promotion of a range of autonomous agencies spanning the rural-urban sector which will manage water and sanitation systems on a fully self-financing basis for O&M and the encouragement of ESAs and national governments to strengthen agencies so that they can function optimally, especially regarding O&M activities.

Under the third heading, Data Collection and Monitoring, the group has set out a number of activities, such as the development and implementation of monitoring systems for O&M costs and national-level performance; the implementation of programmes at the global/national levels which will collect financial and performance data on O&M using standard guidelines; and the development of international methodologies to establish performance indicators and review WHO evaluation guidelines for compatibility with adequate O&M.

There will also have to be a global-level programme to determine as accurately as possible the costs of adequate O&M for various types of water and sanitation systems, and studies to establish extents of savings and/or improvements to efficiency that will result from improved O&M and the use of locally or regionally manufactured spare parts.

To back these up, the group has suggested that ESAs assist with the data collection and monitoring programmes and participate in the exchange of technological experiences between countries.

As regards policy formulation, collaboration, and co-ordination, the group suggested that ESA sector policy documents should be reviewed and a set of policy guidelines established which address O&M issues. Also that national government sector policies and practices on O&M should be reviewed, and national government policies and legal frameworks should be established which ensure that O&M concerns are included in project design from the very outset of the process. Legislation restricting the discharge of pollutants and restricting the use of materials causing O&M problems should be passed, and a forum established where ESAs and national governments could more effectively collaborate in achieving common policies, unified approaches, compatible technologies and standardized equipment within the scope of national policies. The working group also strongly recommended that an international institution act as a focal point and forum to promote, co-ordinate, and reinforce O&M concerns. It felt that the appropriate institution would be WHO, operating with the support of other UN agencies, ESAs, and national governments, with the ESAs supporting WHO as a professional advisory group.

This is the core of the new philosophy of operation and maintenance. The recognition of the crucial role that efficient O&M must play in the development process by local associations, national governments, and the international community can prove to be a vital factor in the decade ahead of us. In this respect, the recommendations of the Working Group gives us clear directions in which to move, the goals we should set ourselves, and the objectives we must attain if the global community is to benefit.