

COMMUNITY WATER SUPPLY AND SANITATION

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MANAGERIAL AND FINANCIAL PRINCIPLES FOR WATER SUPPLY AND SANITATION AGENCIES

**Report of the fourth Consultation
on Institutional Development
Working Group on Cost Recovery**

Geneva, 21 - 25 November 1988

VOLUME I

WORLD HEALTH ORGANIZATION, GENEVA, 1989



This report presents the recommendations of a WHO consultation on institutional development (cost recovery) in water supply and sanitation (Geneva, 21-25 November 1988). Volume I, "Managerial and Financial Principles for Water Supply and Sanitation Agencies", is based on the conclusions of Working Group I on agency-managed systems (Mr H.C. van der Mandele, Rapporteur). Volume II, "Principles and Models to Achieve Sustainable Community Water Supply and to Extend Household Sanitation", reports the conclusions of Working Group II on community- and household-based water supply and sanitation (Mr C. Wang, Rapporteur).

L. Laugeri, WHO/CWS, Secretary of the Consultation.

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ABBREVIATIONS

ANAFID	Association Nationale des Améliorations Foncières, de l'Irrigation et du Drainage, Morocco
Aya	WSS Institute, Costa Rica
CEFIGRE	Centre de Formation Internationale à la Gestion des Ressources en Eau, France
CGE	Compagnie Générale des Eaux, France
EPFL	Ecole Polytechnique Fédérale de Lausanne, Switzerland
GTZ	German Agency for Technical Cooperation
ILO	International Labour Organization
IRC	International Reference Centre for Community Water Supply and Sanitation
NRW	Non Revenue Water
NVE	Norwegian Water Resources and Energy Administration
ONEP	Office National de l'Eau Potable, Morocco
O&M	Operation and Maintenance
PEPAS	Western Pacific Regional Centre for the Promotion of Environmental Planning and Applied Studies
PHC	Primary Health Care
SDC	Swiss Development Cooperation
SNE	Société Nationale des Eaux, Niger
SNEP	Société Nationale de l'Eau Potable, Haiti
TUT	Tampere University of Technology, Finland
UDDAS	WSS National Agency, Mozambique
UFW	Unaccounted-for Water
WAJ	Water Authority of Jordan
WHO	World Health Organization
WHO/SEARO	Regional Office of WHO for South-East Asia
WSS	Water Supply and Sanitation

INTRODUCTION

The Fourth Consultation

1. A consultation was held at the Headquarters of the World Health Organization (WHO) in Geneva, from 21 to 25 November 1988, on Institutional Development in Water Supply and Sanitation (WSS). The 46 members of the Consultative Group included Dr M.M. Nzuwah, Permanent Secretary, Ministry of Local Government, Rural and Urban Development, Zimbabwe, Chairman; Mr Y.N. Ojha, Additional Secretary, Ministry of Housing and Physical Planning, Nepal, Vice Chairman; Mr Eladio Prado, Executive President, Costa Rica Institute for Water Supply and Sewerage (AyA), Rapporteur General; 21 senior sector officials from developing countries; 10 representatives of bilateral and international support agencies; and 12 consultants or experts from private consulting firms.

2. The Secretariat was provided by economists and engineers from the CWS Unit of WHO, including Mr M. Acheson, Manager, and Mr L. Laugeri, Secretary of the Consultation. The complete list of participants is in Annex I, as part of the general list of the seventy members of the WHO Working Group on Cost Recovery in WSS.

3. This fourth Consultation on institutional development in WSS was opened by Dr W. Kreisel, Director of the Environmental Health Division of WHO, who welcomed the participants and recalled the background and objectives of the meeting. Between 1985 and 1988, three consultations and a study group on cost recovery had been organized by WHO and the International Reference Centre for Community Water Supply and Sanitation (IRC/CWS); a Working Group on Cost Recovery had been formed, and it had elaborated guiding principles and frameworks for agency-managed systems, and for community- and household-based WSS. These distinctions between agencies, communities and households had been made to reflect the relative importance of each one of these decision-makers and managers in specific circumstances, e.g. the agency when rehabilitating an urban sewage treatment plant, the community when mobilizing local resources to build a village well, the household when drawing on its savings to buy a latrine slab. Other distinctions, based on system size or urban vs rural differences, were only indirectly considered.

4. The objective of the fourth consultation was to finalize the guidance documents and recommend follow-up action with the support of WHO, IRC/CWS, the donor community, and consultants and consulting firms. Technicians, financiers and users were all represented in the meeting, which included officials from more than thirty countries, both developing and industrialized, of the six WHO regions. The Consultative Group was divided into two working groups, each consisting of English- and French-speaking subgroups. Working Group I defined principles and approaches applicable essentially to agency-managed systems. Working Group II, whose task was of a more exploratory nature, dealt with areas where the main end-responsibility rests with the community, a highly specific entity, and it therefore presented its report in the form of broad guiding principles and reference frameworks, with emphasis on negotiation and implementation processes and procedures.

Results

5. The reports of both working groups reflect a common concern that cash resources should be at least sufficient to cover cash expenditures. Liquidity maintenance and continuity of the service are regarded as essential, hence the definition of a "shoe box principle": nothing can come out of a shoe-box unless something is put into it first. This is an analogy to an old shoe-box being used for storing household cash.

6. The report of Working Group I on agency-managed systems contains managerial principles directed at reducing costs and facilitating their partial or full recovery. Agencies should be granted more autonomy and responsibility, so that they can take steps to improve efficiency, including cost control, reduction of non-revenue water, maintenance of facilities, and improvements in billing and collection. The service provided should be tailored to the needs of the consumers, with the objective of stimulating their "willingness to pay", which is by far more important than what the agency thinks is their "ability to pay". Average tariffs should cover operating expenses, changes required in working capital, debt-service and, where possible, a surplus to allow for extension needs.

7. The report of Working Group II deals with the "Community": this is understood as both the group responsible for managerial and financial decisions and the sum of its members. As cash resources are scarce in most urban poor and dispersed rural communities, Working Group II identified other resources: time, skills, labour and locally-provided materials (and equipment). Cost-recovery, cost-containment and cash-raising approaches should be Community-focused, clearly defined, understood and accepted by the Community, and formally agreed to by the Community. They should reflect the Community's willingness to pay. As a minimum, water rates should cover operation and routine maintenance costs. For low-cost sanitation installations, the cost recovery system adopted should allow the Community to cover the cash requirements of its latrine coverage programme.

Presentation of the Report

8. The report is presented in two separate volumes:

- Volume I (WHO/CWS/89.5), entitled "Managerial and Financial Principles for Water Supply and Sanitation Agencies", is the report of Working Group I (Mr H.C. van der Mandele, Senior Economist, Rapporteur);

- Volume II (WHO/CWS/89.6), entitled "Principles and Models to Achieve Sustainable Community Water Supply and to Extend Household Sanitation", is the report of Working Group II (Mr C. Wang, Sanitary Engineer, Rapporteur).

Implementation

9. The follow-up steps at country level are outlined in Annex II. Some activities, including three regional and six national workshops, case studies, and technical support to on-going projects were decided during the Fourth Consultation and implemented shortly thereafter. The representatives of the twenty-one developing countries present at this consultation have confirmed their intention to field test the guidance material and to support its implementation. Further improvements are therefore to be expected, and the present report should not be regarded as a final statement of policies and procedures, but rather as one of a series of attempts to clarify some managerial and financial principles conducive to cost-containment and improved cost recovery and resources coverage in WSS.

PROBLEM DEFINITION

Common Shortcomings in WSS Financial Management

10. Although many WSS economists and financial analysts are capable of designing sound tariff structures, WSS services are provided in most countries at prices which are unrelated to financial or economic costs. Large consumers including governments sometimes do not pay their water bills. Industries often enjoy the benefits of private supplies and discharge untreated effluents, free of any charge or penalty. Tariffs are high for those who pay. Utilities have irregular incomes and sometimes cannot meet fixed obligations like debt-service or payroll: subsidizing is the rule. Inadequate tariff-setting is but one reason for this state of affairs, the more important ones being unwillingness of user to pay, lack of qualified staff, and lack of political will and commitment to contain and recover costs.

Study Rationale

11. Although the fulfilment of at least minimum WSS needs is an essential step towards the health improvement objectives of most governments, half of the population of the developing world is still deprived of adequate WSS facilities. Providing WSS free of charge to part of the population would result in a lack of these services for other people. The need for managerial and financial improvements is critical, due to budgetary constraints and the necessity to optimize water utilization. Service levels deteriorate for lack of provisions to cover replacement, maintenance and even operational needs, so that it has become essential to improve the allocation, size and timing of application of investment funds, as well as take all possible cost containment measures, and diversify and increase the sources of recurrent income.

12. Water tariffs which reflect future needs can exceed the means of the poor. The compensation possibilities are reduced, due to the imbalance between the low-income population which grows rapidly, and the stagnating group of large consumers. Efforts to extend services towards urban poor and rural areas are often in vain, because of a growing need to subsidize those who have water. A large part of the water is lost in distribution, and the remainder is often sold at less than cost, while the poor who are not served are charged high prices by water vendors. There is a need for the less-privileged communities, irrespective of size or location, to organize themselves to construct, operate and maintain WSS facilities, and to derive maximum benefits from them, while ensuring that all costs are met.

13. Broader institutional improvements, based for instance on coordinated intersectoral action, decentralization, or in some cases divestiture of responsibilities, can within limits be conducive to improvements in financial management. The reduction of non-revenue water (NRW - all water which is unaccounted for or otherwise unpaid) remains the most effective cost-containment measure in most water supply systems.

Purpose of this Report

14. This report summarizes the results of a consultation of professionals of the WSS sector, in order to provide information and guidance on possible managerial and financial improvements to students of all disciplines, political decision-makers of all tendencies, and community members and agency managers in charge of providing and maintaining WSS services at prices compatible with the needs and means of the people they serve.

SOME GUIDING MANAGERIAL AND FINANCIAL PRINCIPLES FOR AGENCIES

- Water and sewerage agencies should be granted AUTONOMY in order to provide an efficient and satisfactory service. While subject to public interest regulations, they should operate on a commercial basis.
- The agency's management should be such as to ensure optimum EFFICIENCY (technical, commercial, financial, etc.)
- The agency should focus on COST CONTROL: on the investment side by avoiding premature investment or investment on too large a scale and by selecting appropriate technology, and on the recurrent side by an OPTIMUM UTILIZATION of FACILITIES, which should be achieved by minimizing the amount of non-revenue water, maximizing the efficiency of billing and collection and implementing adequate preventive maintenance measures.
- The service provided by the agency should be tailored to the consumers' needs, which requires in particular a good CONSULTATION with the consumers, market studies and good public relations.
- "Ability to pay" criteria can at their very best be broad guidelines and represent an external assessment, whereas "WILLINGNESS to pay" is far more relevant.
- The agencies should provide a service for which the consumer is willing to pay. To achieve financial viability, the average tariff should be fixed at such a level that all cash needs (except sudden emergency needs which would cause intolerable tariff fluctuations) are covered, including where possible an adequate self-financing margin to fund extensions (LIQUIDITY MAINTENANCE).
- Increased efforts should be made by the donor community to help water supply and sanitation agencies to reach a SOUND FINANCIAL POSITION; projects which may undermine the financial viability of the sector should not be undertaken.
- The agency should KNOW (through internal information systems, accounts, meters, etc) how much it finances, how much water it produces, and where the water goes.
- Subject to average tariffs being sufficient to cover liquidity needs, the following selected principles should be followed for specific consumers:
 - . the public standpost service should be financially autonomous, with an average tariff to the retailers (entrepreneurs/community organizations/other agencies) equivalent to the variable costs of supplying these connections; the rates should be such that under normal supply conditions the financial situation of the agency cannot improve by closing these facilities;
 - . large consumers* should pay the long-run marginal cost of water;
 - . where the capacity of the natural drainage system is - or is expected to become - insufficient, the costs of a sewerage/drainage system (existing or future) should be gradually covered by a charge, for instance a levy on water use, except for water used to cover minimum human needs; a similar charge should also be applied in the case of private abstraction of water.

* "large" applies to consumers who can effectively decrease their consumption if given appropriate price signals. Several reviewers felt that this recommendation should apply to all consumers: average tariffs should reflect the full economic cost.

ACTION LINES

15. The implementation of these action lines will depend on the actual situation in each country and on the possible ways of implementing changes. These action lines should be seen as a whole, presented here under seven principal headings:

1. financial and administrative autonomy;
2. cross-subsidization;
3. financial management and planning;
4. cost-effective operation and maintenance;
5. equity and willingness to pay;
6. sector planning and project preparation;
7. roles of governments and international agencies.

A list of financing options usually available for agency-managed (mostly piped) systems is given in Annex III.

1. Financial and Administrative Autonomy

Rationale

16. WSS agencies should be granted financial and administrative autonomy, if they are to become really effective and free from direct political influences, which can undermine financial viability, often result in postponement of urgently needed tariff adjustments, and divert revenues meant for water and sanitation to satisfy needs of other sectors. Autonomy is also required if the organization is to attract adequately qualified staff with appropriate salaries and career structures, and it should be regulated by specific legislation. Autonomy can also be understood as a sector-wide concept, with permanent consultation required between the agency and its customers.

Divestiture of Responsibilities

17. In the sequence input-output-outcome-impact, the public institutions are often seen as mostly concerned with the maximization of their inputs (e.g. their development budget) and their outputs (e.g. number of systems constructed) on which their performance will be assessed. The intention behind divestiture of responsibilities is to further improve the output/input ratio, and to maximize outcome and impact, thereby expanding companies' markets. All of these objectives are difficult to achieve and can hardly be pursued concurrently by any one agency. When granted a monopoly, which is generally the case, a private water company may even be motivated by the sole objective of maximizing its output/input ratio within a reliable market beyond which it will not willingly expand its services.

18. Matters of public interest cannot easily be vested in private hands in the absence of strict regulatory mechanisms, especially in sectors like water supply which have direct public health implications. Government interventions are required to ensure that services will be extended to the less privileged, that best use will be made of resources, especially those which can be provided locally, and that the company can remain viable without charging exorbitant prices to other sectors of the economy (e.g. industry or tourism).

19. Water supply agencies, whether public or private, have a very high proportion of fixed costs, and must devote the largest share of their (variable) income to meet payroll and debt-service obligations. Private companies are subject to pressures to ensure the continuity of their service. Their income structure should be such as to allow for maintenance of existing assets and for

depreciation, and to meet service expansion needs if this can be done without tariffs becoming excessive.

20. All of these objectives can be pursued concurrently by both public and private institutions. A private company should remain creditworthy, pay its staff and maintain a satisfactory service level. Provisions are therefore required to monitor and control its activities as well as foster their development. Alternatively, its mandate can be restricted to operation and maintenance activities, with or without commercial risk.

21. The existence of a wide variety of standard agreements to govern the relationship between government and private companies in public utilities suggests that "privatization", despite its merits, may not be an absolute panacea in WSS, and the process should therefore be selective and carefully regulated. Some review of newly-implemented divestiture methods (e.g. through leasing in Burkina Faso, or franchising projects executed by the International Labour Organization in Kenya) is also warranted, together with a study of social aspects, such as why user groups and cooperatives (instead of individual vendors) sometimes run standposts.

Efficiency and Expansion

22. Tariffs adjusted for inflation and incorporating an allowance for depreciation and a rate of return are likely to meet the expansion objective of the sector, by channelling towards future beneficiaries the surplus which they generate from existing facilities. They are also likely to meet the efficiency objective corresponding to an optimum use of resources from all sectors, by channelling funds to pay for these resources, at least as long as there is no distortion between their market prices and their real economic values. Where such distortions exist, it is recommended that tariffs be adjusted to reflect the value of water to the economy as a whole rather than to the utility alone*.

Revolving Funds

23. A revolving fund is a credit facility earmarked for a specific sectoral activity. Revolving funds contribute efficiently to expansion in domestic water supply: the model is particularly well adapted to the specific supply/demand conditions and expansion needs of the water market. In addition, it tends to encourage improvements in accounting and planning for the entire sector. However, its ability to facilitate expansion varies considerably between countries, with specific constraints related to high service costs, slow demand growth, and inadequacy of the sector's institutional framework.

24. The constraint of "high service costs" means that if tariffs are calculated in the manner specified above (para. 22), average prices may become so high as to defeat the purposes for which renewal funds are created. They may exceed the thresholds of consumers' willingness to pay for the service.

25. The performance of a revolving fund largely depends on the ability of the institution to forecast accurately future demand and supply conditions. Revolving funds can revolve only if growth occurs at every stage of the development process. The assumption that demand will either remain stable or grow, irrespective of price changes, may apply within limits to individual consumptions; it does not apply, however, to the collective demand of most communities, which in many developing countries will have a fast-growing low-income consumers' category. Supply limitations (e.g. intermittent systems, high levels of leakage and wastage) may also severely affect the growth and service extension potential of a revolving fund.

* This decision concerning a specific sector depends on the overall policy of government towards public utilities and related sectors.

26. Revolving funds are often used to extend services to low-income communities. A delivery system is often used, which transfers resources from larger urban centres to medium-size towns and eventually to rural areas. Centrally-managed public utilities are generally unable or reluctant to extend their activities to small agglomerations, since this would tend to lower their financial performance, the financial base of the revolving fund can therefore be threatened.

27. Where revolving funds are feasible, they have the merit of forcing the sector into a disciplined and reliable organizational framework, they can act as catalysts and long-term regulators. They also give a better chance to agencies to break even, if cash needs are not greater (and revenue smaller) than projected. As long as such funds continue to revolve, the entire water supply sector can rely on their proceeds. It is however essential that governments be committed to their continuous financial performance, and in particular that enough surplus income generated as a result of the fund's activity be earmarked to ensure that revolving funds do revolve.

Decentralization*

28. Decentralization can occur in the form of "deconcentration" (of the central agency into units closer to the community) or "devolution" (of power to the community), or (preferably) both. It varies according to topographic, climatic and demographic conditions, and such physical and human characteristics often play an important role in the need for decentralization and its success. While CWS agencies have known limits to their decentralization potential, software providers such as Public Health agencies are usually more deconcentrated. Integration of CWS and other elements of PHC can therefore serve as support to decentralization.

29. Devolution of authority and responsibility to self-reliant community structures with support from software providers is probably the most effective arrangement; it requires important recurrent budget increases. In many instances, even though decentralization of CWS institutions takes place, there is little increase in actual spending for the rural subsector. Financial autonomy should at least be achieved in urban CWS before decentralization can be effective: this requires a strong government commitment.

30. Community participation provides opportunities for reducing cash costs in less-privileged areas. In many cases, urban services have been made more accessible to the poor through more participation, varying from voluntary labour (to reduce connection costs), to operation and maintenance of group connections and standposts by user groups, and autonomous operation of small installations such as handpumps.

31. Decentralized provision of hardware often increases unit costs sufficiently to offset the benefits of the process, as the general scarcity of resources is compounded by logistic constraints. There appears to be a limit beyond which construction, operation and maintenance costs increase sharply. Also, municipal or provincial agencies often construct and operate water supply and sanitation installations; deconcentration may be difficult or useless if the central agency overlaps with strong regional or local agencies. Finally, in most of the least developed countries, deconcentration is very limited in all sectors, because of lack of support and contact structures such as provided by provincial capitals or regional development centres, and this limits the decentralization potential of WSS.

* An elaboration of the ideas for community-managed systems is to be found in Volume II. This section deals principally with the agency aspects of decentralization.

Autonomy in Development

32. More funds should be made available to the water supply and sanitation sector on concessional terms. Excessive overhead charges imposed by some central governments on loans in the water and sanitation sector should be reduced or eliminated*. WSS agencies should also seek to diversify their capital structures by encouraging equity participation from provincial and central government, and seeking capital contributions from large consumers/users (e.g. industry) with whom appropriate future water/sewerage tariffs can then be negotiated.

2. Cross-Subsidization

33. Cross-subsidization should be selective and carefully designed and monitored. In terms of equity and economics, the less privileged part of the population should bear a minor share of the burden of water and sanitation charges. Not all agree, however, as to whether people using low-cost systems (due to size and/or source) should contribute to the construction and operation of high-cost facilities. In some cases, as a result of attempts to transfer financial and other resources by cross-subsidy from urban to rural areas, urban consumers' contributions may become excessively high; alternatively, urban tariffs cannot be raised and the water agency may be in danger of losing its financial autonomy.

3. Financial Management and Planning

34. Greater emphasis should be placed on improved management and planning to ensure that optimum use is made of existing assets, that proposed new investments are adequately phased, of correct size, and fully justified, and that user charges are adequate and acceptable. Effective financial planning depends on an accurate financial and technical data base incorporated in a suitable management information system.

REQUIREMENTS FOR FINANCIAL PLANNING

- reliable and up-to-date information on: mapping of systems; number and location of connections; quantities and costs of water produced; billing, cash collection and consumption by consumers' category (available through meter and accounting records and/or regular consumer surveys) and other indicators;
- proper commercial accounting audited internally and externally with results available within six months of the end of each financial year;
- realistic annual budgeting;
- preparation of roll-over five-year financial plans in order to determine the tariff levels required in relation to a pre-defined maintenance and investment programme; such plans should be conceived as dynamic and not static, with annual monitoring and updating;
- in financial planning, the maintenance of cash liquidity should be the prime objective: a positive balance should be maintained between sources and applications of funds, to cover direct operating expenses, debt-service obligations and a contribution to future capital requirements.

* The Working Group was in favour of keeping in WSS any surplus from on-lending operations which would be made at the expense of the WSS sector.

4. Cost-effective Operation and Maintenance

Cost Effectiveness

35. An important objective should be to optimize the use of existing assets so that they deliver the most cost-effective service without needing substantial capital investment too early. This entails effective manpower planning (with productivity targets, motivation and appropriate training), optimization of inputs (e.g. electricity consumption, chemicals, services) to minimize unit costs, and efficient maintenance planning with increased emphasis on preventive maintenance and substantial reductions in unaccounted-for water (leaks, inaccurate meters, etc.), and other NRW.

36. The underlying causes of revenue losses should be identified and addressed. This will improve the quality and quantity of information available to management, for instance to complete its records of capital assets; understand the optimum operational performance of the system; optimize billing and revenue collection; improve operational efficiency, which is essential to ensure consumer's confidence and satisfaction; and obtain direct benefit from a non-revenue water control policy through a reduction in annual operating costs and postponement of capital works schemes. Since in most water supply systems there is a very substantial proportion of NRW, it should be a major priority to reduce it: target levels of 20% (in some cases 25 to 30%), are feasible and recommended.

37. Agencies should consider improving the financial viability of their organizations in order to work towards optimum cost effectiveness. Particular emphasis should be given to the efficiency of staff, the control of non-revenue water, financial appraisal procedures, and billing and revenue collection processes. In some countries, specific attention needs to be given to controlling the foreign exchange components of operating costs.

38. CWS agencies should place great importance on proper billing and collection procedures, ensure adequate cash inflow and avoid build-ups in arrears which undermine the efficiency of financial planning. They should also explore ways and means of diversifying their sources of income, e.g. sales of sludge and reuse of treated effluent, subject to adequate protection against health risks.

39. In most places, women are often the main users and domestic managers of drinking water, and are faced with the greatest problems in sanitation (privacy, safety, health, etc.). Especially in the case of public taps and communal sanitation, they can be strong supporters of both the introduction and maintenance of improved facilities. However, this potential can only be used to the full benefit if steps are taken to involve women (and other essential users and domestic managers) in project preparation and implementation.

40. As previously mentioned, the agency can examine the possibility of privatizing some of its operations if this can result in a more cost-effective service. Contracts with non-agency related bodies (or other forms of divestiture) could be limited to discrete activities, such as: maintenance of machinery and equipment; treatment plant operation (water and sewerage); leak detection and repair; and billing and collection of revenue.

Preventive Maintenance

41. Besides the unpredictable hazards of major breakdowns in the absence of preventive measures, the rationale for investing resources in preventive maintenance is based on expected improvements in the reliability of the supply, and avoiding or postponing lump-sum rehabilitation or new investment. Preventive maintenance also lowers recurrent costs. In developing countries, its importance could not be overemphasized in view of the gradual deterioration of water systems and the high level of NRW. The amount of preventive maintenance required varies from one system to the other. Failure to carry it out may lead to inability of a system to operate as originally designed or to work at full capacity. The need for preventive maintenance can be further justified on the premise that no meaningful waterworks expansion programme should be initiated if the existing system is not properly operated and maintained. The lack of preventive maintenance leads to the premature replacement or rehabilitation of equipment, requiring the utilization of scarce funds which could perhaps have been employed to extend CWS services to more people.

Intermittent Supplies

42. In some developing countries, small water systems operate at best 12 hours a day. This may be due to inadequate operations and insufficient capacity of the facilities, or resorted to in an effort to minimize pumping and energy costs and thus reduce charges. In the latter case, this means that the system is not operating at its full capacity because the community prefers to pay minimal charges. To improve the system on the assumption that it will be operated 24 hours a day may be illusory because there is no assurance that the users' preference will change. In most urban systems however, increasing reliability increases the potential of cross-subsidization to less privileged consumers. Capacity constraints caused by high NRW and intermittent service often encourage large consumers, particularly industry, to build their own private supplies.

Metering

43. As shown in the table herebelow, there are both arguments for and against metering. The weight of these arguments depends on local conditions. Indiscriminate metering in small urban systems may however not solve problems which are generally related to poor operation and maintenance. It may be prudent to consider the flat or rather graded rate concept (based on indices other than volumes) as an alternative to total metering, particularly in the case of weak institutional set-up and insufficient technical and organizational capability.

44. In order to minimize water wastage associated with flat-rate connections, regulating devices such as flow restrictors, may be used to limit the quantity of water provided to users. These devices are, however, of limited value, essentially because they are easily tampered with. Preference should be given to improvement in the accuracy of the design flow of the entire distribution system. In all cases, local conditions and acceptability by the community of the proposed changes should be fully taken into account.

45. Metering is not in itself a cost-containment measure; it is a step which should be considered first upon starting improvement programmes designed to reduce the level of non-revenue water. NRW includes leakages in pipes, under-registration by defective meters, reservoir and other operational losses which can decrease as a result of physical rehabilitation of facilities and technical improvements. But it also includes the considerable amount of water which is consumed either illegally or because laws to regulate the use are non-existent or not enforced, and this raises a more serious problem of resources management.

PROS AND CONS OF METERING

- pros: increase in revenue - equity - reduction of misuse and wastage - conservation of the resource - more accurate economic costing and pricing providing signals to increase or decrease consumption - use of a single parameter (volume) - differential tariff structures according to volume consumed - possibility to calculate meaningful lifeline rates, to predict average revenue and growth in demand - improvement of the commercial and accounting organization, management and control of a public utility - better technical control of water supply systems (subject to adequate master metering).
- cons: cost (acquisition in foreign currency, installation, preventive maintenance, inspection, repairs) - consumers' reactions to defective meters (vandalism, non-payment) - irregular income (as opposed to flat rates) - high levels of under-registration and other technical problems (adaptation to local conditions) - logistic and other difficulties related to inspection and reading (on which billing and collection depend) - high level of accuracy required prior to computerization - billing system purely volumetric and impersonal perhaps not adapted to equity objectives - poor reliability of supply may be an obstacle to consumers' willingness to pay for metered consumption.

5. Equity and Willingness to Pay

46. The misplaced concept of free water is still in use in many countries. Access to safe water and adequate sanitation has been declared a basic human right by the United Nations. This had led to the erroneous conclusion that these services should be available to all free of charge. However, in most developing countries, where full coverage is far from attained, the supply of free water to any given consumer implies that the service will not be extended to others who have equal right to it.

47. It is often assumed that water at the standpost should be free: this is generally not feasible in the many countries where hundreds of thousands of consumers are either served by standposts, or not served, while only a few hundreds of those with private connections can be regarded as large consumers likely to subsidize others. Many water supply agencies in developing countries are or will be confronted with periods of acute liquidity shortages and capacity short-falls. Management is often forced to close down non-revenue services to remain in operation; this can have serious public health consequences.

48. To the poor, who consume little water and have a tradition of paying high prices to vendors, for a service which is generally accepted as it is, equity is essentially related to actual qualitative improvements, easier access, and the extension of significant advantages to as many people as possible. Whether the improvement is significant or not will be a determinant of the acceptability of the proposed tariff; this willingness to pay is probably much more important than the concept of affordability. In many cases for instance, people are willing to accept public standposts as a temporary solution only; they would be willing to pay for private connections, but seem discouraged by the high cost. However, when given an opportunity to connect, most persons make financial efforts beyond the threshold of affordability.

49. Willingness to pay should be measured through regular consumer surveys, which would gauge consumer satisfaction with the existing service and proposed

changes. The views of women as main water users and domestic managers should be investigated and recorded separately. Cost recovery will be greatly facilitated if the services provided correspond to the needs and willingness to pay of the users. Involvement of the community in pre-planning, planning and evaluation activities is essential to ensure users' participation in the cost recovery process.

50. Specific attention should be given to the needs of the urban poor to ensure that the tariffs levied are reasonable and appropriate, and that they serve to optimize the consumers' use of the system in relation to what they can afford. In addition, to serve the large and fast-growing low-income urban population, there is a need to widen the range of intermediate options between paid private connections and free public standposts, and to match the needs of users with varying financial and administrative solutions. Possible options include: shared private connections and sanitary blocks serving clusters of households, metered group connections paid for by a larger user group with its own group committee, semi-autonomous systems (piped water sold in bulk to a specific neighbourhood or group which organizes its own distribution system), autonomous systems (groups or neighbourhoods establish and manage their own community-based systems), and concession sales by female heads of households (who have no other source of income and can also give hygiene education). Some financing options for piped systems, e.g. "voluntary contributions" (Annex III) may not correspond to the requirements of agency-managed systems.

51. A large share of the sector's income goes to water vendors: the less privileged consumers who do not even have standpost service often pay ten times as much for water as the clients who enjoy the benefit of a private house connection. Nevertheless water vending can be used effectively when properly regulated; in some cases people believe that the water sold by the vendor is of better quality than the piped municipal supply. In some countries, water vendors are provided with a private metered connection supplying a public standpost. A concession agreement is made between the utility and the vendor, with covenants stipulating the concessionaire's maximum selling price and other obligations. Consumers pay much less than they would to vendors, and each concession has a profit margin equivalent to a reasonable salary.

52. Health education may increase the willingness to pay but water/sanitation improvements are often adopted for other reasons (convenience, status, etc.). Health education should be directed at the entire community, particularly at the main financial decision-makers. It should not be limited to mere promotion and distribution of one-sided health messages but be based on thorough knowledge and understanding of the target groups. Through education and awareness campaigns, misuse and wastage of water should be minimized to enable the agency to extend its service to more potential users.

53. A stepped tariff structure should form the basis of the main charges levied on the community. This structure encourages consumers to save water and avoid misuse and wastage, as they adjust their consumption according to their willingness to pay for different levels of services (education and awareness campaigns are additional instruments in achieving this aim). Differential structures should be developed for different user groups (e.g. domestic and industrial/commercial) for both water and sewerage services.

54. It is essential to convey, not only to the authorities, but also to the general public, the message that adequate water rates are necessary for the continuation and improvement of services and as such should be reviewed at least annually. The donor community should support water supply and sanitation agencies in their efforts of educating authorities and consumers alike in this respect.

6. Sector Planning and Project Preparation

55. Sector planning should be more creative and flexible in identifying appropriate projects for support by the international community. Current sector planning is often carried out in isolation by each ministry or international development agency and only serves the needs of the particular institution. This inevitably leads to duplication and competition which is detrimental to the rational development of the water supply and sanitation sector. A more coordinated approach is warranted, which involves all of the relevant institutions in the country concerned and the interested international (multilateral and bilateral) development agencies. This has implications on the coordination of financing plans and therefore on the costs to be recovered.

56. Intersectoral action is particularly required in the less-privileged districts of large cities; shortly before CWS services are extended to these areas, the need is felt by many water and sanitation agencies to obtain support from more decentralized structures such as those of the Public Health or Education sectors, in order to ensure that the future beneficiaries are adequately informed of the costs and benefits of CWS services, and that they will in the future save water and accept to pay for it. Similarly, although to a lesser extent, intersectoral collaboration can result in improvements in both cost containment and cost recovery in the residential and industrial areas of large urban agglomerations. The activities and costs of intersectoral programmes should be included in pre-investment planning studies.

57. Human resources development plays a vital role in the improvement of the water and sewerage sector. The international donor community should support and encourage the human resources aspects of development by including project components for developing training needs analyses; initiating and supporting management development programmes; and assisting organizations to manage change by supporting institutional development programmes, and developing and implementing improved operational and management procedures.

58. Without support in these critical areas, the improvements required in the sector may not be achievable. Donor agencies should emphasize the importance of human resources development as an essential ingredient in the overall improvement of water and sewerage organizations. Development programmes should be primarily directed towards human resources productivity, public relations and community involvement, financial management, preventive maintenance, and improving billing and collection.

59. The concern to improve sector planning should also be reflected at the project preparation stage. Some improvements required in pre-investment activities and studies are as follows:

- more emphasis should be placed on market research and community participation at all stages of project preparation, through user consultations and consumer surveys, to ensure that the service offered matches the "real" demand;
- more consideration should be given to community-managed projects in low-income areas as a more cost-effective method of extending coverage and providing phased improvements in levels of service;
- the effective use of local expertise and the mobilization of local resources should be encouraged;
- more effective and appropriate technical support should be provided to water supply and sanitation agencies in the form of consultancy contracts which require not only the study of a problem and

preparation of appropriate solutions, but also advice on implementation and monitoring through local agencies;

- risk analysis should be included in project identification and implementation;
- greater attention should be paid to realistic implementation schedules, accurate project costing and acceptable standards of construction;
- it should be realized that it takes time for water supply agencies to reach a sound financial situation;
- the procedure for monitoring project implementation and post-implementation performance should be established at the time when the project is appraised.

7. Roles of Governments and International Agencies

60. Governments should give more autonomy to water agencies with regard to the calculation, management, and operation of their own water tariffs - which may differ from an agency to another - on at least a liquidity maintenance but preferably a cost recovery basis, subject to appropriate regulation by public authorities. Sufficient budgetary resources should be allocated and disbursed for governmental or public sector entities depending on government financing, to enable these entities to pay for their water consumption.

61. Governments should ensure that water agencies are adopting adequate and appropriate financial and technical monitoring indicators, and report the results timely to public authorities; to facilitate the attainment of the financial autonomy objective by WSS agencies it may be necessary in certain circumstances to assist them temporarily in resolving occasional difficulties.

62. WHO and other international agencies should:

- organize regular exchanges of views on financial and management topics related to water supply and sanitation: this could be in the form of a regular journal drawing contributions from and being circulated to finance and management specialists of water and sanitation;
- promote and support technical research on specific issues in WSS, e.g. metering, leak-detection, operation and maintenance;
- promote in-depth research into specific topics of current interest, e.g. cost recovery, or provision of CWS services to the urban poor;
- continue to promote operation and maintenance support programmes;
- prepare and disseminate information on specific CWS technical subjects, e.g. financing options for piped systems;
- recommend international standards relative to different aspects of the water supply and sewerage sector, as minimum targets or goals to be achieved:
 - * drinking water quality guidelines (continuation);
 - * standard consumption in urban and rural communities (e.g. design criteria in liters per capita per day or distance to water points);
 - * standards of treatment to be applied in sewerage;
 - * guidelines on WSS affordability assessment.

A N N E X E S

- ANNEX I - Working Group on Cost Recovery in CWS
List of Members
- ANNEX II - Short-term Follow-up Plan
- ANNEX III - Financing Options for Piped Systems

WORKING GROUP ON COST RECOVERY IN CWS
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SHORT-TERM FOLLOW-UP PLAN

ANNEX II

PHASE I - Initial presentation and dissemination of results of the Fourth Consultation, including preliminary versions of the Reports.

<u>Activity</u>	<u>Agencies</u>	<u>Date</u>
- Marrakech Workshop for Union Africaine des Distributeurs d'Eau	WHO EDI/CEFIGRE	December 1988
- IWSA Symposium on Cost and Price of Water in Urban Areas - Paris	WHO IWSA	December 1988
- Broadcast by the World of Health radio information programme	WHO	Dec.-Jan. 1988
- Staff Seminar on Health Economics WHO, Geneva (Switzerland)	WHO	December 1988
- Philippines national workshop	Philippines	March 1989
- Mongu (Zambia) intercountry workshop (Malawi, Zambia, Zimbabwe)	NORAD/IRC	Jan.-Feb. 1989
- Malawi (National Workshop, Case Studies)	The Netherlands	Aug. 1989
- Rabat (Morocco) intercountry workshop (9 English-speaking countries)	WHO/EMRO	Feb.-Mar. 1989
- Rwanda national seminar	WBk/UNDP/WHO/IRC	May 1989
- Ethiopia national seminar	WBk/UNDP/WHO/IRC	to be determined
- Rabat (Morocco) seminar (rural)	ANAFID/WHO	March 1989
- Bangkok (Thailand) intercountry seminar	CEFIGRE/WHO	April 1989
- Malaysia national seminar	WHO/PEPAS	May 89 - March 90
- Portugal national seminar	WHO/EURO	October 1989
- Intercountry workshop for West African countries	GTZ/WHO	to be determined

PHASE II - Field Work and Publications

<u>Activity</u>	<u>Organizing Agencies</u>	<u>Dates</u>
- Planning meeting - The Hague (The Netherlands) - selection of field test areas - preparation of terms of reference - calendar of activities - documents	IRC/WHO/Financing Agencies	July 1989
- Country activities	Government Agencies/IRC/ Financing Agencies /WHO	Jan-Dec 1989

PHASE II - Field Work and Publications (cont'd)

<u>Activity</u>	<u>Organizing Agencies</u>	<u>Dates</u>
- Finalization of the Report	WHO	July 1989
- Publication of the Report	WHO	Oct. 1989
- Presentation of a Manual (summary)	WHO	Nov. 1989
- Publication of a manual with case studies (if possible)	WHO	June 1990

PHASE III - Full-Scale Field Use of Manual (or other final document)

Types of activities

- Seminars and Workshops
- Case Studies
- Publications, Presentations
- Promotion
- Support to CWS institutional development
- Project Planning and Appraisal
- Support to Project Preparation
- Financial Studies

Current Issues in Various Countries and Regions

- Volume I (agencies) - Nearly all countries listed below have indicated the existence or the current preparation of an urban water supply master plan with financial components.

- Burundi = tariffs, sanitation tax, public standposts' management;
- Costa Rica = private supplies (industry);
- Ivory Coast = transition from wells to piped supplies;
- Jordan = metering, unaccounted-for water;
- Malaysia = sewerage tariffs, privatization;
- Morocco = tariffs in secondary centres;
- Niger = tariffs, maintenance costs;
- Syria = cost of water in urban areas;
- Zaire = motivation to pay in urban poor areas.

- Volume II (communities) - The objective is to test the frameworks and assess the acceptability of the guiding principles.

- Morocco = rural water supply (ANAFID)
- Philippines = rural water supply
- Rwanda = rural sanitation
- Uganda = handpump maintenance
- Zaire = Cost recovery in rural areas
- Zimbabwe = rural CWS

- Volumes I and II (intercountry workshops and seminars)

- Africa = Union Africaine des Distributeurs d'Eau (UADE) - EDI/CEFIGRE workshop, Marrakech (Morocco), December 1988
- Malawi-Zambia-Zimbabwe = NORAD/IRC workshop, Jan.-Feb. 1989
- West Africa = GTZ/WHO workshop, May-June 1989
- International Water Supply Association - Paris Symposium, Dec. 1988
- South-East Asia = CEFIGRE workshop, Bangkok, April 1989
- Malaysia and Western Pacific = PEPAS seminar, Kuala Lumpur, May 1989

FINANCING OPTIONS FOR PIPED SYSTEMS

<u>What?</u>	<u>When?</u>	<u>What for?</u>	<u>Who organizes?</u>	<u>How?</u>
voluntary funds	in communities with a tradition of fund-raising, seasonal income, and a good knowledge and control of payments according to household capacity and benefits	financial contributions to construction; occasional larger contributions to maintenance and repair of simple systems with public water points	traditional leadership, voluntary organizations, e.g. women's groups, tap organizations	targets are set and funds collected periodically through meetings, house-to-house collections, bazars, etc. Funds are collected in advance or when required
general community income	in communities with own sources of income and a water supply with public facilities	annual maintenance and repair, financial contributions to construction; depreciation and expansion where possible	local government, community water committee or subcommittee	reservation of funds based on the estimated costs and net annual income of the community; cost-reduction or income generation where necessary
cooperative funds	water supply initiated and financed through production cooperative or village revolving fund; no direct payments for water used	annual maintenance and repairs; repayment of construction loan; depreciation and expansion where possible	cooperative's executive committee, community water committee or subcommittee	reservation of funds based estimated costs and income from cooperative ventures and/or member fees; cost-reduction or income generation where necessary
flat rates	families have private taps, or share taps with well-defined social group, have fairly reliable incomes, and benefit more or less equally	repayment of community loan for construction; annual maintenance and repairs; depreciation and expansion where possible	water committee or subcommittee, board of water users cooperative, local government, tap users' committee	project agency advises on rate for approval by users; rates are collected and administered by the local water organization
graded rates	in communities with appreciable differences in water use and benefits and sufficient community spirit to divide user households into different payment categories	repayment of community loan for construction annual maintenance and repairs; depreciation and expansion where possible	community water organization with support from promoters or other social experts assisting the project agency	private tap owners are classified in high and low categories, using local indicators of water use and wealth; users sharing taps may pay lower or equivalent individual rate
mixed systems	in communities with large differences in payment capacity and water use, with high and low-income households living in separate sections	repayment of community loan for construction; annual maintenance and repairs; depreciation and expansion where possible	water agency with community water committee or subcommittee	surpluses or private taps are used to finance the costs of free public taps in poorer sections
water metering	in large communities with limited water resources and an efficient administration	repayment of community loan for construction, annual maintenance and repairs; depreciation and expansion where possible	water agency and/or community water organization	meter reading, billing and rate collecting by separate workers, or payment through banks, at central government offices or local branches
vending instead of a piped distribution network	in communities where a socially valuable vending system can be improved, where other solutions are technically, economically or politically impossible	contribution towards financing of the recurrent costs of the agency, and financing of vendor service costs, including upkeep of hygiene and simple repair	water agency paid operators, women's groups of water sellers' cooperative	water is sold from metered taps at controlled prices; when buying prices are subsidized, selling prices may equal private rates, the difference forming the vendors' income
vending as part of a piped distribution network	in communities where group connections or cross subsidies between private and public taps have not worked	contribution towards financing of the recurrence costs of public taps and the service of the vendors, including upkeep of hygiene and simple repairs	water agency paid operators or socio-economically appropriate concessionnaires, e.g. women heads of households	
coin-operated taps	not recommended because of their great sensitivity to breakdown and interference			
direct or indirect water taxes	in communities where the transfer of sufficient funds to the water organization is assured and taxation can be related to water use and costs	annual maintenance and repair; repayment of construction loan; depreciation and expansion where possible	local government service organization for a specific area, e.g. a low-cost housing scheme	taxes are used exclusively for financing one or several basic services; categories of payment are based on level of service or housing conditions

Source: What Price Water? User Participation in Paying for Community-Based Water Supply, by Christina van Wijk-Sijbesma, IRC, Water & Sanitation Center, The Hague, March 1987