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DRAFT GUIDELINES ON COST RECOVERY
IN COMMUNITY WATER SUPPLY AND SANITATION

REPORT OF THE
THIRD INFORMAL CONSULTATION
ON INSTITUTIONAL DEVELOPMENT
WHO, GENEVA, 11-15 APRIL 1988
STUDY GROUP
IRC/CWS, THE HAGUE, 21-23 JUNE 1988

World Health Organization
Geneva

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This report, which presents the recommendations of an informal WHO consultation on cost recovery in community water supply and sanitation (Geneva, 11-15 April 1988), and of a special Study Group on community-managed systems (The Hague, 21-23 June 1988), has been prepared by the Community Water Supply and Sanitation Unit of WHO in Geneva.

(L. Laugeri, editor).

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ABBREVIATIONS

CMWSS	Community-manageable Water Supply and Sanitation
CWS	Community Water Supply and Sanitation
DWSF	District Water Supply Fund (Malawi)
EPFL	Ecole Polytechnique Fédérale de Lausanne (Switzerland)
HSN	Household Sanitation
ILO	International Labour Organization
IRC	International Reference Centre
LWUA	Local Water Utilities Administration (Philippines)
MWSS	Manila Water/Sewerage System (Philippines)
NRW	Non Revenue Water
O&M	Operation and Maintenance
ONEA	Office National d'Eau et d'Assainissement (Burkina Faso)
PHC	Primary Health Care
RWDC	Rural Waterworks Development Corporation (Philippines)
RWSA	Rural Water supply and Sanitation Associations (Philippines)
UFW	Unaccounted-for Water
WASH	Water and Sanitation for Health Project
VWS	Village Water Supply (Lesotho)
WD	Water District (Philippines)
WHO	World Health Organization
WHO/SEARO	Regional Office of WHO for South-East Asia

INTRODUCTION

The Third Consultation

1. An informal consultation was held at the Headquarters of the World Health Organization (WHO) in Geneva, from 11 to 15 April 1988, on Institutional Development in Community Water Supply and Sanitation (CWS). The 19 members of the Consultative Group included Mr M. Alvarinho, Director, National Water Supply and Sanitation Agency of Mozambique, Chairman, six economists and engineers from private consulting firms, two CWS specialists from European universities, two representatives of the International Labour Organization (ILO), six representatives of financing agencies, one representative of the International Training Centre for Water Resources Management (ITCWRM/CEFIGRE), and one representative from the International Reference Center for Community Water Supply and Sanitation (IRC/CWS). Mr C. Wang, Sanitary Engineer, was designated as Rapporteur. The complete list of participants is attached as Annex I. A special Study Group (Annex II) on Cost Recovery in Community-managed CWS reconvened in IRC/CWS, The Hague, Netherlands, with the same Rapporteur, between 21 and 23 June 1988, in order to complete the findings of the Geneva meeting.

2. The third Consultation was opened by Mr Michael A. Acheson, Manager, Community Water Supply and Sanitation Unit, who welcomed the participants and recalled the background and objectives of the meeting. The first Consultation, which took place in November 1985, resulted in recommendations on administrative organization, decentralization, intersectoral action, coordination, community involvement and development, and transfers of resources (essentially funds and manpower). The second Consultation, which took place in October 1987, dealt mostly with transfers of funds: its objective was to recommend improvements in revenue collection methods and reduction of non-revenue water. While the members of the first Consultation were senior officials from developing countries, the second Consultation was made possible by voluntary contributions from consulting firms, universities, ILO and IRC/CWS, who provided the services of high-level experts. These contributions were renewed on the occasion of the third Consultation.

3. The objective of the third Consultation, in which representatives of financing agencies were involved for the first time, was to review the recommendations of the report of the second Consultation,¹ and to prepare in draft form relevant guidance material which would subsequently be submitted to potential users and beneficiaries, at a meeting of national officials to be convened in November 1988. The participants of the previous Consultation had divided themselves into two Working Groups, to formulate recommendations on cost recovery in CWS: (i) in piped systems (mostly urban, agency-based) - Group I, and (ii) in other systems (mostly rural, community-based) - Group II. In the third Consultation, the only distinction retained between the two Working Groups was derived from the differences between agency-managed versus community-managed CWS installations.

4. Working Group I formulated draft guidelines on the basis of precise recommendations from the last meeting, thereby fulfilling the objectives of the Consultation. The members of Working Group II followed a different approach,

¹ WHO/CWS/87.5 "Cost Recovery in Community Water supply and Sanitation - Report of the Second Informal Consultation on Institutional Development - Geneva, 5-9 October 1987", also available in French.

dealing with institutional development rather than limiting themselves to precise issues in cost-containment and cost recovery. The respective outputs of the two Working Groups are therefore different, consisting of a set of draft guidelines in the case of Group I, and of a model with broader guidance and frameworks in the case of Group II, whose work was of a more exploratory nature; this is also the reason why Group II found it useful to reconvene in IRC/CWS.

Summary of Findings

5. It was generally agreed that the long-term objective of cost recovery could not be questioned in the present context; rather, it should be defined more precisely in different situations. For agency-managed systems for instance, Group I showed that it could be misleading to assume that cost recovery should be based on a conventional accounting approach to cost pricing, but rather that it should be related to the objective of constant liquidity maintenance, without which CWS agencies cannot survive. As regards community-managed installations, Group II felt that the expression "cost recovery" should not be construed as a hard-line, no-compromise economic decision of an outside authoritarian institution to recover its own costs, but rather as the communities' own objective to cover its own expenses and maintain a liquid cash position.

6. In both Groups, the concepts of liquidity maintenance and actual ability of the agency or the community to continue to provide services were regarded as essential, hence the definition of a "shoe-box principle": nothing can come out of a shoe-box if it has not got in first.

7. Group I therefore developed the findings of the previous consultation on piped systems, which were largely dominated by a common concern that tariffs which are correctly designed to cover cost expressed in accounting terms fail to generate sufficient cash revenue to cover cash expenditures, because non-revenue water is high, cash income is much less than a reasonable portion of receivables, and there is a general confusion between depreciation allowances and allowances for bad-debts on the one hand, and loan amortization and cash deficits due to unrecoverable arrears.

8. Group II reiterated the objective of community-maintainable water supply and sanitation (CMWSS), which had been formulated at the last Consultation, and endeavoured to answer the questions: what should be recovered? why? from whom? when? how? Besides the definition of fundamental principles, the model proposed includes the identification of key elements of cost and of sustainability, the assessment of required community, household, and agency inputs and their relative importance during development and recurrent phases, and the identification of options available for expense coverage.

9. As in the case of the second Consultation, the Working Groups reported separately on their respective findings, as it became apparent that it would be vain to try to merge their conclusions and recommendations into broad statements of the Consultative Group on the subject of cost recovery in general. There was no common strategy emerging from one Consultation, but rather one distinct approach for each Working Group (except for liquidity maintenance as a prerequisite to sustainability). These approaches are therefore presented separately here.

PROBLEM DEFINITION²

Importance of cost recovery

10. As half of the population of the developing world is still deprived of adequate CWS services, the provision of these services free of charge to some people implies that they will not be extended to others. In view of the current intensification of CWS programmes, hampered by serious budgetary constraints, the issue of cost recovery from users becomes critical; it is compounded by the problem of apportioning the burden of rates between people of different needs and means.

Difficulty to recover full cost

11. The cost of water does not decrease over time, as the temporary benefits of capacity extensions are more than offset by subsequent expenditures for the mobilization of new resources; therefore the price of water cannot decrease over time. If tariffs are calculated to reflect future needs, they exceed the means of those who must have water at low cost. Now the scope for cross-subsidization is reduced as a result of the imbalance between the fast-growing low-income population and the stagnating or declining large consumers' group. Efforts to extend services towards urban poor and rural areas are often vain, because of the persistent need to subsidize those who have water. One drop of water out of three is lost in distribution; the two which remain are sold to the rich at half of their cost price, while only the poor pay to the water vendors a true market price.

Cost containment

12. As a companion policy of cost recovery, cost containment is thus becoming an essential ingredient of sound financial management. Coordinated intersectoral action, decentralization, or in some cases divestiture of responsibilities, can within limits be conducive to improvements in both cost recovery and cost containment. Technical improvements -- supply management -- include preventive maintenance and overall reduction of non-revenue water (NRW = leakage in network + reservoir losses + firefighting and illegal use + meter under-registration + operational use + all other unpaid water), and adoption of higher construction standards, while demand management essentially consists in orienting consumption through appropriate tariff structures. A discussion of the main issues relevant to cost containment in CWS is presented in Annex III.

Cost recovery

13. Costs can be recovered through tariffs, which are used to channel funds to the supplying agency, which pays for the resources used, and channels any surplus to improve or extend the supplies. Tariff systems can be assessed with reference to the following four objectives: equity (in relation to present users), autonomy (of the agency), efficiency (in the use of resources), and expansion (to future beneficiaries). A discussion of the main issues related to these objectives and the corresponding assessment criteria is presented in Annex IV.

² Abstracts from document WHO/CWS/87.5 "Report of the Second Informal Consultation on Institutional Development - Geneva, 5-9 October 1987".

DRAFT GUIDELINES FOR COST RECOVERY IN AGENCY-MANAGED SYSTEMS

RECOMMENDATIONS OF THE CONSULTATION (WORKING GROUP I)

Principles adopted for the preparation of guidance material

14. In the discussions of the Working Group on agency-managed systems (essentially piped water supply and sewerage), the following main principles were evolved:

- the financial management function within the organization should be such as to ensure optimum billing and collection efficiency;
- water and sanitation authorities should be granted increased autonomy if they are to provide a cost-effective public service;
- the operations of these authorities should be more responsive to the needs of the communities which they serve; this requires improvements in users' consultation and market research, and effective public relations;
- greater emphasis should be placed on cost efficiency and optimum use of existing assets;
- tariff structures should provide for cross-subsidization in order to relieve the financial pressure on the urban poor.
- if the geohydrological situation and/or the population density are such that without a water-borne sewerage system, water supply causes unacceptable environmental damage, water rates should be such as to ensure that the financial needs of sewerage are covered in addition to those of water supply; this does not imply that water supply and sewerage should be entrusted to the same agency.

15. The sector should be well organized and financially sound, in order to provide a service for which the community is willing to pay. In order to justify existing and proposed user charges, cost recovery should be viewed in the broader context of providing a cost-effective service, and not in the narrow sense of imposing a defined tariff. The issue of cost recovery applies equally to water supply and sewerage services.

16. The Working Group on agency-managed systems presented draft guidelines under eight principal headings:

- (i) financial and administrative autonomy;
- (ii) financial management and planning;
- (iii) cost-effective operation and maintenance;
- (iv) willingness to pay;
- (v) cost-containment through improved resources utilization;
- (vi) implications for sector planning and project preparation;
- (vii) human resources development;
- (viii) role of WHO.

Other recommendations, and case studies which were presented at the previous Consultation, are summarized in Annex V, in support of the various observations and suggestions of Working Group I.

(i) Financial and administrative autonomy

17. Urban water supply and sewerage agencies should be granted increased 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. Increased 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 defining the objectives and responsibilities of the agency, and the procedures of accountability to the community and to the government.

(ii) Financial management and planning

18. 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 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. The requirements include:

- 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); other indicators such as balances;
- 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 obligations and a contribution to future capital requirements.

(iii) Cost-effective operation and maintenance

19. Annual operating costs can be divided into direct operating costs (cash) and capital costs (depreciation and interest) or expenditures (debt-service - interest + amortization of principal). In relation to direct operating expenses, the objective should be to optimize the use of existing assets so that they deliver the most cost-effective service without needing substantial capital investment. 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 non-revenue water (unaccounted-for water: leaks, illegal connections, inaccurate meters, etc.).

20. It is recommended that the underlying causes of revenue losses be identified and addressed. This will improve the quality and quantity of information available to management, for instance to identify its 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. It should be a major priority of any water and sewerage authority to reduce the non-revenue water to a target level of 20% of water produced.

21. In order to build up sufficient capital funds to allow for replacement of assets at the appropriate time, the effect of inflation should be taken into account for depreciation purposes, and as far as present consumers can be expected to pay the corresponding expenditures, it should be reflected in tariffs.

22. If capital loans, particularly from international sources, are on-lent on harder terms than those of the original loans, the difference should remain within the water and sewerage sector. Excessive overhead charges imposed by some central governments on loans in the water and sanitation sector should be reduced or eliminated. CWS 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.

(iv) Willingness to pay

23. It is recommended not to use the concept "ability to pay". "Ability to pay" criteria can at their very best only be broad guidelines and represent an external assessment, whereas "willingness to pay" is far more relevant. Market research needs to be carried out to measure the willingness to pay of each consumers' category, taking into consideration specific circumstances, in the various countries, regions and areas.

24. Tariffs should be set at levels which reflect the cost recovery targets of the organization and the community's willingness to pay. They should also be reviewed annually and increased regularly to reflect increasing costs and the levels required in relation to the financial planning process. It is recommended that a stepped tariff structure should form the basis of the main charges levied on the community. This type of structure encourages consumers to save water and avoid misuse and wastage, and it reflects their willingness to pay for different levels of services. Differential structures should be developed for different user groups (e.g. domestic and industrial/commercial) for both water and sewerage services.

25. Annual reviews of tariffs, as long as they are technically and economically justified, are necessary for the continuation and the improvement of the services. It is essential, for the water supply and sanitation agencies, to convey this message, not only to the authorities, but also to the general public, and their efforts should be supported by the donor community.

26. Willingness to pay should be measured through regular consumer surveys, which would gauge consumer satisfaction with the existing service and proposed changes. Special steps should be taken to ensure that the views of women as main water users and domestic managers are 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.

27. 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), and autonomous systems (groups or neighbourhoods establish and manage their own community-based systems).

28. Health education may increase the willingness to pay but most water/sanitation improvements are adopted for other reasons (convenience, status, etc.). Health education should be directed at men when they are 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.

(v) Cost-containment through improved resources utilization

29. 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.

30. In order to ensure efficient allocation of national economic resources, the average tariff charged for the service should be equal to or close to the economic cost of water (its long-run marginal cost), which reflects the real value of the resource to the economy, rather than its market value.

31. 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.

32. Women are generally 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 in project preparation and implementation.

33. Another recommended measure is that the agency should examine the possibility of privatizing some of its operations if this can result in a more cost-effective service. Privatization (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.

(vi) Sector planning and project preparation

34. 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 development agencies (multilateral and bilateral). This has implications on the coordination of financing plans and therefore on the costs to be recovered.

35. In the project preparation process, there are several important factors which should receive more prominence in the drafting of terms of reference and project specifications:

- 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 for the provision of both water supply and sanitation services 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 actual implementation in an advisory capacity;
- greater attention should be paid to realistic implementation schedules, accurate project costing and acceptable standards of construction;
- the monitoring of project implementation and post-implementation performance should be made more effective;
- increased efforts should be made by the donor community to help water supply agencies to reach a sound financial position; considerable time is involved; projects that may undermine the financial viability of the sector should not be undertaken: it is therefore very important to include risk analysis in project identification and formulation.

(vii) Human resources development

36. Human resources development often plays a vital role in the further 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;
- assisting organizations to manage change by supporting institutional development programmes, and developing and implementing improved operational and management procedures.

37. Without support in these critical areas, the improvements required in the sector will 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. These development programmes should be primarily directed towards human resources productivity, public relations and community involvement, financial management, preventive maintenance, and improving billing and collection. The human resources development programme should assist in achieving autonomy in CWS.

(viii) Role of WHO

38. Besides its activities in human resources development, WHO acts as an important forum for the exchange of views and information on the development of the water supply and sanitation sector. However, there are a number of ways in which this role could be made more effective and practical:

- organize regular exchanges of views and analyses of development in 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 agencies and other appropriate institutions in developing countries, international development agencies such as the International Labour Office, national and international research institutions, consultants and other interested parties;
- promote and support technical research on specific issues in the water supply and sanitation field, e.g. improvement of water meters;
- prepare and disseminate information on specific CWS technical subjects;
- 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 (Annex VI) and cooperate with ILO in these areas (Annex VII).

PROPOSED FRAMEWORKS FOR COST RECOVERY
IN COMMUNITY-MANAGED SYSTEMS

RECOMMENDATIONS OF THE CONSULTATION (WORKING GROUP II)

Background

39. Working Group II was charged with the tasks of (1) studying cost recovery for community-maintainable water supply and sanitation systems, using recommendations from the 2nd Informal Consultation as background reference, and (2) developing the basis for draft guidelines for practitioners. Five questions were posed:

What should be recovered?

Why should it be recovered?

From whom should it be recovered?

When should it be recovered?

How should it be recovered?

Of particular concern was the subject of cost recovery issues in settings where it is difficult to obtain monetary contributions or user payments to fully/partially cover investment and operation and maintenance expenditures. In developing countries, cost recovery should be seen as a means to achieve higher-order goals and impacts of CWS interventions -- e.g. improved health, improved quality of life, or increased economic development. It should neither be an isolated theme nor an end in itself.

Thus, for community water supply interventions, cost recovery is a critical building block of project sustainability, whereas for low-cost sanitation interventions, it is an important means leading to the achievement of wide-spread latrines coverage, i.e. increased general ownership and use. Finally, cost recovery issues for projects intended to serve cash-poor communities cannot be addressed without exploring fundamental development concepts (divergence-convergence format, illustrated in Figure 1).

Working Group II met in WHO, Geneva, from 11 to 15 April 1988 and in IRC/CWS, The Hague, from 21 to 23 June 1988. The Geneva Consultation resulted in the elaboration of a broad model for dealing with cost recovery in community-managed water supplies. This model was subsequently developed during the special Study Group in The Hague, which also included discussions on household sanitation, and the preparation of two draft cost recovery frameworks.

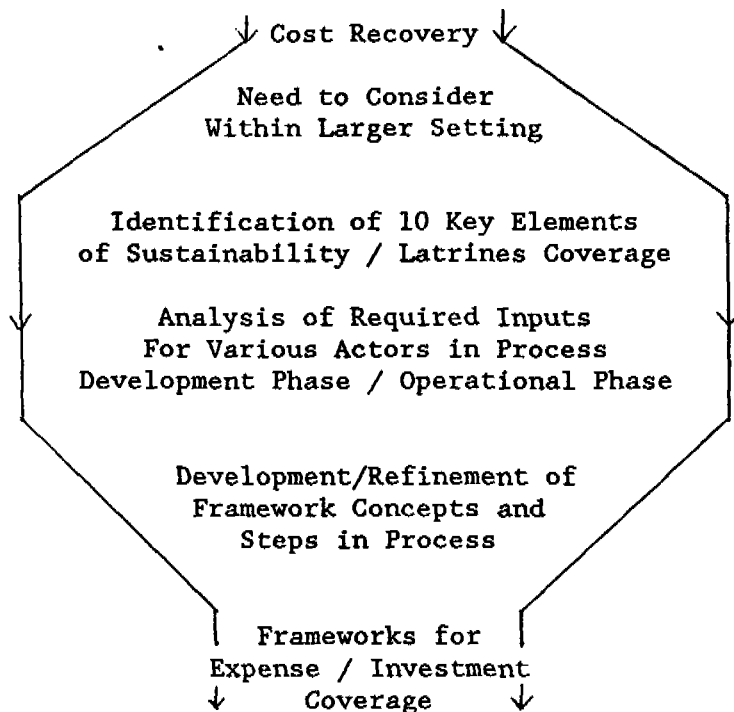


Figure 1. Schematic of Approach Followed by Working Group II.

Output and Potential Uses

40. Draft frameworks applying to the following two situations were developed:

- For community water supply, where ownership and responsibility for operation and maintenance (O&M) of constructed facilities are transferred from the ministry or organization responsible for construction over to the community.
- For household sanitation, where ultimate responsibility for construction of simple, on-site, non-water-borne sanitation units, and on-going cleaning and periodic maintenance, rests with individuals (construction can be on a fully-, partially- or non-subsidized basis).

The draft frameworks are intended as analytical tools to be used to achieve better understanding of cost recovery issues in project development. They can help to ensure that cost recovery principles are identified, analyzed, planned, designed into projects, applied, refined and evaluated in different country-/programme-/project-level contexts. Importantly, they can also be used as budgeting tools. They provide the bases for interactive processes involving project planners and beneficiaries. They are flexible, and can be modified to suit particular use and user requirements. Perhaps their greatest value will occur when actively used by project actors as tools in joint planning and decision-making processes.

Exhibit I. Possible Applications of Cost Recovery Frameworks

During Development Phase:

* Project preparation:

- To identify resource inputs, commitments, responsibilities and rights of project beneficiaries and responsible executing agencies.
- To prepare budgets for financing institutions, executing agencies and communities.

* Project appraisal:

- To determine soundness of project design in terms of cost recovery and sustainability.

During Operational Phase:

* Project appraisal:

- To assess soundness of existing project design in terms of cost recovery and sustainability.
- To evaluate project success and performance.

Other Possible Uses:

- * To develop CWS cost recovery policies and strategies.
- * To define monitoring indicators.
- * To provide information on cost recovery issues through case studies and workshops.

Though primarily designed for projects in rural settings, the draft frameworks are felt also to be applicable to urban settings where similar circumstances may be encountered, e.g. in some slums, squatter communities, and peri-urban areas.

The draft frameworks, similar in general application to both water supply and household sanitation, comprise six steps:

- Step 1. Define framework application.
- Step 2. Define input indicators.
- Step 3. Identify and assess required inputs.
- Step 4. Quantify required inputs.
- Step 5. Identify sources of required inputs.
- Step 6. Finalize responsibilities.

Steps 1 and 2 are used to clearly define application, units of measurement, desired results, and intended users; step 3 is used to identify and assess required inputs and their timing, with inputs framed within larger development contexts of sustainability for water supply, and increased latrines coverage for sanitation; step 4 is used to quantify these cash and in-kind inputs; steps 5 and 6 are used to identify and select sources of required cash and non-cash inputs.

The intention of the above-described steps is to develop and refine information that leads to more realistic planning, better decision-making and fair, equitable establishment of reciprocal responsibilities, commitments and rights.

Why Two Frameworks?

41. Separate draft frameworks have been developed for community water supply and for household sanitation, as there are important cost recovery distinctions that can be made between the two types of projects: operational expenditures usually represent a much larger share of total project-life costs for water supply projects than for household sanitation projects (Figure 2); for water supply projects, cost coverage relates primarily to operational activities, to meet O&M and replacement expenses, whereas for low-cost sanitation schemes, cost coverage relates primarily to investment activities, to meet costs of construction in materials, labour, etc. For water supply projects, the main goal is sustainability. For low-cost sanitation schemes, the main goal is expanded, improved latrines coverage.

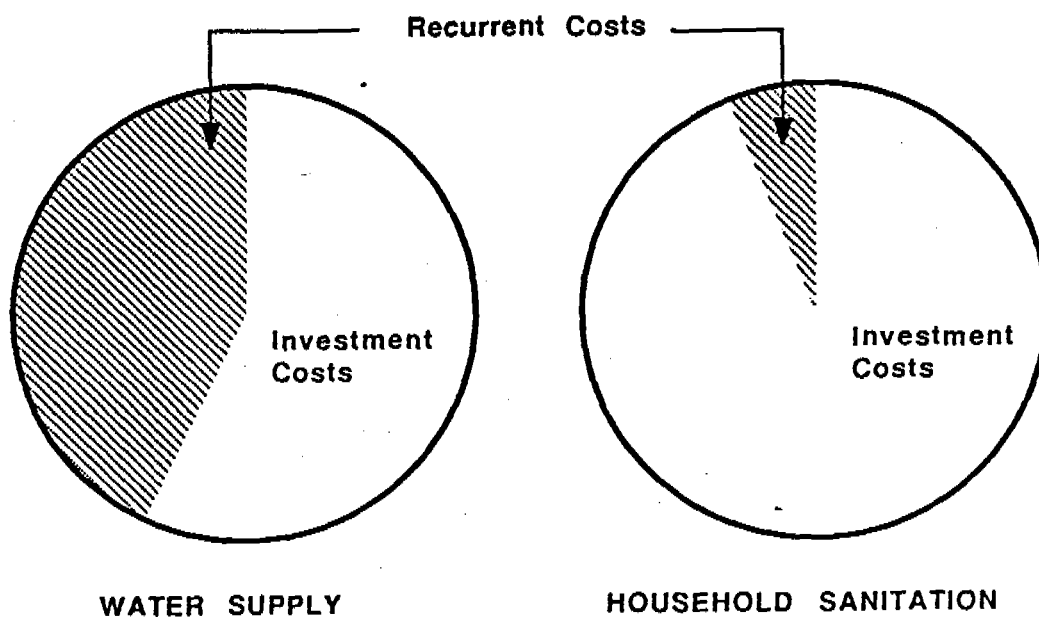


Figure 2. Relative Distributions of Investment and Recurrent Costs During Lives of Community Water Supply & Household Sanitation Projects

Terminology and Elements of the Models

42. The expression "cost recovery" can convey an impression of hard-line, no-compromise economic decisions and authoritarian institutions; this may be inappropriate in the context of cash-poor settings. New expressions are therefore adopted here: "expense coverage" for water supply and "investment coverage" for household sanitation.

- ** "Community" in the context of community water supply means the collective group of users that accepts full responsibility for ownership and O&M of installed facilities.

- ** "Agency+" is defined very broadly and means any organization, body or person outside the Community. Agency+ may be a ministry/-department of water, another private or public institution, a financing or donor organization, a non-Government organization, etc., or any combination of organizations.

- ** "Household" in the context of household sanitation means the individual/family that accepts responsibility for constructing and maintaining a low-cost, on-site, non-water-borne sanitation unit.

- * * "Ex-Household" is defined very broadly and means any organization, body or persons outside the Household. Ex-Household may be a ministry/department of health, another private or public institution, a financing or donor organization, a non-Government organization, the Community served by water supply, etc., or any combination of organizations.

- ** "Key elements of sustainability" relates to community water supply projects and means the 10 elements identified below and briefly described in Exhibit II.

- ** "Key elements of latrines coverage" relates to household sanitation schemes and means the 10 elements of latrines coverage identified below and briefly described in Exhibit III.

- ** "Expense coverage" relates to community water supply projects and means the accumulation of sufficient cash to cover incurred expenses. Expense coverage necessarily implies liquidity and positive cash flow. Depending on situations and where appropriate, expense coverage could also include major replacement expenditures and/or capital contributions.

** "Investment coverage" relates to household sanitation schemes and means the accumulation of sufficient cash to meet and/or pay back (1) any construction costs not covered by others, and which cannot be replaced with in-kind inputs, and (2) maintenance phase expenses.

** "Development phase" and "operational phase" mean the project phases occurring before and after change in ownership and responsibilities. For water supply, the dividing point occurs when the completed system is officially "handed-over" to the Community. For household sanitation, the dividing point occurs when the individual/family accepts responsibility for constructing an on-site sanitation unit.

** "Inputs" means required resources that must be supplied by the Community, Agency+, Household or Ex-Household to ensure satisfactory achievement of key elements of sustainability or latrines coverage. Inputs are divided into time, skills, materials/equipment and cash, where:

Time refers to magnitude of "labour" and "communication" time, defined as follows:

"Labour time" means time associated with unskilled, physical labour activities, e.g. digging, removal of stones, transportation of building materials, etc. Labour time can be on a paid basis, or contributed as in-kind input.

"Communication time" means time associated with all other project-/scheme-related activities, e.g. for awareness creation, consultations with, within and by the Community or other groups, organization, training, planning, design, construction, support, follow-up, etc.

Labour time + communication time = 100 percent of all time inputs.

Skills refers to importance of required skills.

Mat'ls/
Equip. refers to magnitude of supplies valued at going market rates.

Cash refers to magnitude of cash transfers at Community-level or within the Community.

Exhibit II. Water Supply: Key Elements of Sustainability

Key Element No. 1. Strong Community institutions.

Relates to institutions and administrative mechanisms required for successful community-based management, especially implementation of expense coverage -- e.g. community water/health committees, women's groups, financial management systems, etc.

Key Element No. 2. Appropriate skills.

Relates to development and maintenance of all technical and non-technical Community/Agency+ skills required to successfully implement community-based management and expense coverage.

Key Element No. 3. Coverage of required operational phase inputs.

Relates to coverage of operational phase cash/in-kind inputs connected with provision of water supply at planned service levels.

Key Element No. 4. Supportive attitudes.

Relates to development and reinforcement of general human attitudes essential for successful achievement of sustainability and expense coverage -- e.g. understanding, motivation, choice, ownership, etc.

Key Element No. 5. Accepted service levels.

Relates to understanding and acceptance of levels of service associated with water supply facilities to be constructed -- e.g. continuity and reliability of supply, maintenance requirements, costs, etc. Closely linked with technology choice.

Key Element No. 6. Appropriate technology.

Relates to selection of water supply technology suitable to given situations. Along with other technical/non-technical factors, willingness to pay should help determine technology choice.

Key Element No. 7. O&M-related supportive systems & services.

Relates to establishment and maintenance of backup systems and services that must be available at appropriate time, provided to required extent by others outside Community. Examples of systems/services include distribution of spare parts; provision of equipment and technical expertise to carry out major repairs; etc.

Key Element No. 8. Community extension services.

Relates to important activities initiated mainly by Agency+ -- e.g. community organization, mobilization and participation, health education (both initial and ongoing), etc.

Key Element No. 9. Decisions on responsibility.

Relates to formal decisions between Agency+ and Community at start of project where there is agreement and clear statement concerning who is responsible for what, when.

Key Element No. 10. Execution of responsibilities.

Relates to carrying out of timely development and operational phase responsibilities as agreed upon in Key Element No. 9.

Exhibit III. Household Sanitation: Key Elements of Latrines Coverage

Key Element No. 1. Appropriate technology.

Relates to selection of on-site sanitation technology suitable to socio-cultural conditions of area. Affordability, acceptability, availability of materials, local soil conditions, locally-known construction techniques, etc. should be amongst criteria that influence technology choice.

Key Element No. 2. Support of local leaders.

Relates to strong support for health improvement actions by recognized community leaders (formal and informal) that motivates community members to take action.

Key Element No. 3. Local awareness.

Relates to creation of awareness and reinforcement of beliefs amongst individuals and households concerning benefits of, and needs for, better hygiene and sanitation.

Key Element No. 4. Household priority.

Relates to individual/household attitudes and desires to genuinely want to construct and use latrines. Priority implies willingness to contribute required cash and/or in-kind contributions.

Key Element No. 5. Examples of low-cost sanitation successes.

Relates to positive promotional effects gained by developing and having successful latrines projects to refer to, visit and learn from.

Key Element No. 6. Appropriate skills.

Relates to development and maintenance of technical and non-technical skills required to successfully financially support, implement and sustain household sanitation schemes.

Key Element No. 7. Involvement of women.

Relates to communication with, and meaningful involvement of, women, who must be considered prime movers and family-unit opinion-formers for better hygiene and sanitation.

Key Element No. 8. Community extension services.

Relates to health-related activities -- e.g. health education -- initiated, implemented and followed-up by public sector institutions.

Key Element No. 9. Decisions on responsibility.

Relates to formal decisions between Household and Ex-Household at start of project where there is agreement and clear statement concerning who is responsible for what, when.

Key Element No. 10. Execution of responsibilities.

Relates to carrying out of timely development and operational phase responsibilities as agreed upon in Key Element No. 9.

Decision process

43. For water supply, an important concept underlying the key elements of sustainability is that the Community -- and especially women -- is/are actively involved in the decision-making process, i.e. that project beneficiaries themselves discuss options, implied service levels and costs, levels of cash and in-kind commitments they are willing to bear, sources of cash and in-kind inputs, etc., and then select the technology best-suited to their own particular situation. This type of decision-making process can be represented schematically (Figure 3). This process requires time, an important point to be realized and accepted; it very often, however, will result in more realistic projects, and lower investment and recurrent costs.

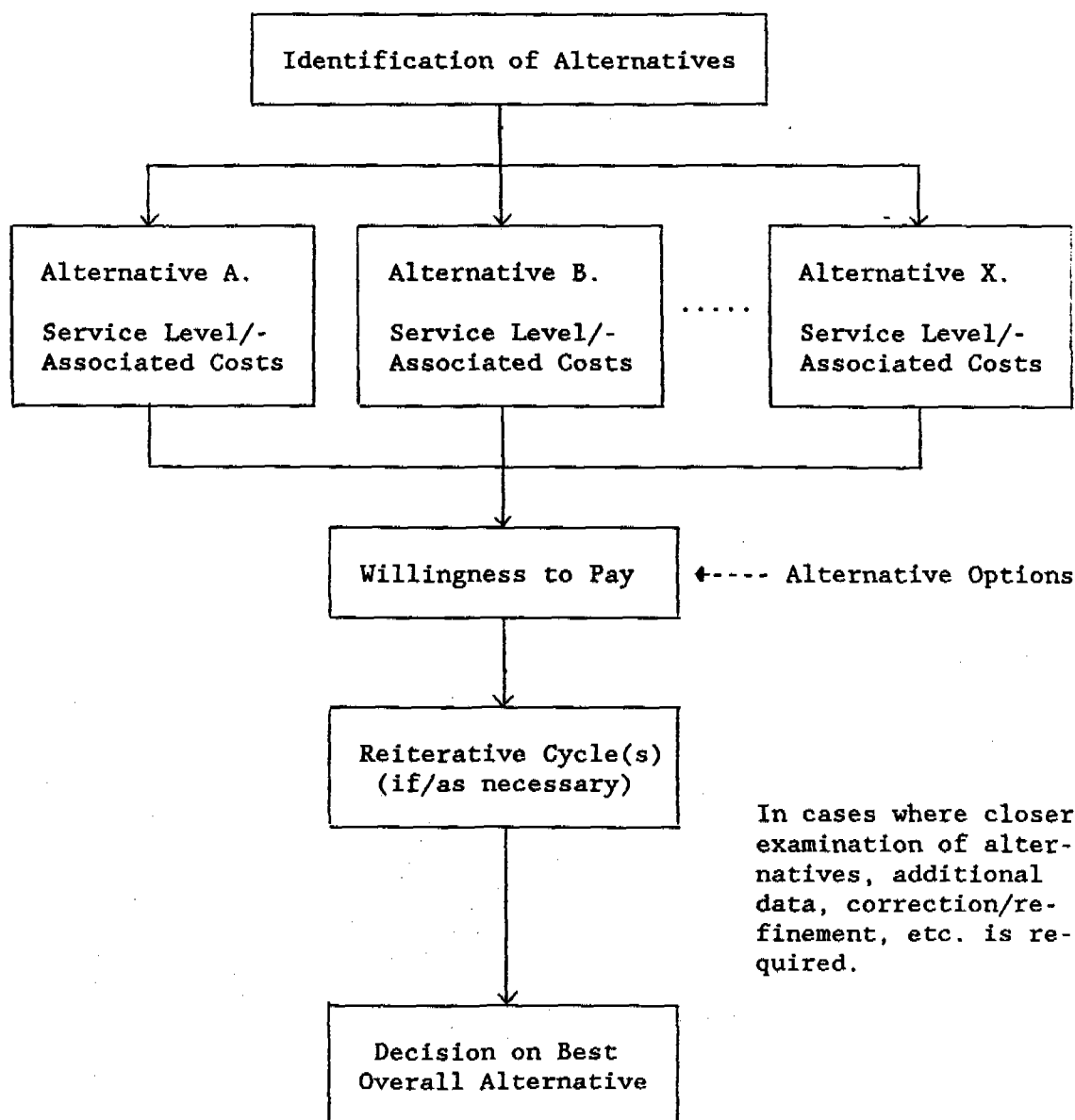
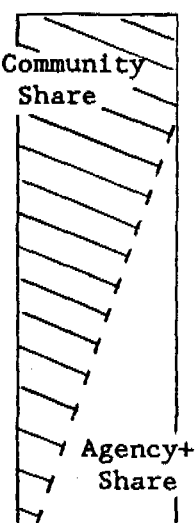


Figure 3. Schematic of Decision Process Model.

Cost-sharing Model

44. A key question relating to water supply is "What costs are to be recovered from the Community?". The answer depends essentially on policies, economic realities, cash availability, social customs, and cultural practices. In some instances, depreciation and interest may be included, though expense coverage will be more likely limited to O&M costs and in rare instances replacement costs. Types of costs that can be included under water supply expense coverage are identified in Table 1. The figure on the left-hand side of the table shows there exists a boundary between Community and Agency+ responsibilities having implications concerning which costs each party must be prepared to fully or partially bear. The boundary line shown is intended to be illustrative only; in fact, it will vary, and should be drawn on a case-by-case basis.

Table 1. Cost-sharing in water supply.

Cost Division	Cost Type (see also Appendix B)
	<ul style="list-style-type: none"> * Routine O&M. * Routine repairs. * Replacement/repair due to vandalism. * Replacement/repair due to improper or negligent O&M by Community. * Replacement of worn-out equipment at expiry of normal service life. * Extraordinary replacement/repair requiring specialized equipment, highly skilled technicians, etc. * Partial/full recovery of investment. * Extension/upgrading of services. * Replacement/repair due to faulty construction/installation by Agency+. * Replacement/repair caused by natural disasters. * Replacement/repair caused by war. * Debt service.

Cost Recovery

45. How costs can be recovered at Community-level, i.e. from what sources, is also a major area of concern. There are often a number of options that can be considered; major ones are identified in Table 2 and treated in detail in "What Price Water? User Participation in Paying for Community-Based Water Supply", by Christine van Wijk-Sijbesma (IRC Water and Sanitation Centre Occasional Paper Series, The Hague, March 1987). See also Appendix C.

Table 2. General Types of Financing Options Available to Community

Community Fund-Raising	Regular Charges
. Voluntary funds	. Unmetered flat rates
. Community revenue	. Unmetered graded rates
. Community revolving funds	. Mixed systems
. Production Cooperatives	. Metered taps
Water Vending	Water Taxes
	. Direct taxes
	. Indirect taxes

Presentation of Draft Frameworks

46. The six-step draft frameworks for water supply and sanitation are similar. For the sake of clarity, the steps of each framework are presented separately, as Exhibits IV and V, respectively.

Framework tables to be completed are included in Appendix A:

For water supply: Tables WS.1, WS.1.1, WS.1.2, WS.1.3, WS.1.4, WS.2.1, WS.2.2, WS.2.3 and WS.2.4

For household sanitation: Tables HSN.1, HSN.1.1, HSN.1.2, HSN.1.3, HSN.1.4, HSN.2.1, HSN.2.2, HSN.2.3 and HSN.2.4

Coding and limited notes are included with the tables, and definitions have already been given, but clearly, completion of the tables requires some subjective evaluation and estimates. Further, since the various key elements of sustainability/latrines coverage are not mutually exclusive, there are bound to be areas where overlap can occur.

Given the above, it is important to try to maintain as consistent a set of judgement values and "rules" as possible to avoid doubling up identified inputs. This may initially involve some backtracking and correcting of previously-given ratings before a consistent logic is developed, but afterwards, procedures should become fairly routine.

It is envisaged that key elements of sustainability and latrines coverage be viewed differently depending on progress in the project cycle. At conceptualization and initiation stage, the key elements represent goals/objectives/targets to be achieved. During implementation phases, they are activities. And for monitoring, review and/or evaluation exercises, they are standards against which progress or achievement are measured.

47. Steps 1 and 2 of the process are important; investing time wisely to define intended application, indicators and units of measurement will result in clearer thinking and better end-results.

Step 3 is critical, as it establishes the overall context in which expense/investment coverage must be seen, and demonstrates important relationships between various key elements and various involved parties. For illustrative purposes, completed "Overview" and "Assessment of Inputs" forms are presented as the last section of this report, "Examples of Completed Tables"; these relate to water supply and household sanitation in general, based on collective Group knowledge and experience.

Once Step 3 is completed and inputs assessed, it is apparent where, when and from whom major inputs are required. Further, information exists in easily visualizable form, i.e. "***" immediately draws attention to inputs of importance, while " - " indicates that comparatively little, or no, input is required.

In proceeding through the analyses of required inputs for the different key elements, it should also become quite clear which key element areas require attention and what specific needs arise -- especially useful information at initial planning and mid-course review stages of a project.

In Step 4, required inputs which were given relative weightings in Step 3 are quantified. Cash needs and inputs with budgetary implications can be quantified in terms of currency -- both local and foreign, if appropriate -- while in-kind inputs can be quantified in appropriate units, e.g. as days of time, numbers of items to be supplied, cubic meters of materials, etc.

Steps 5 and 6 require that sources of required cash and in-kind inputs be identified, then selected. Implicit in these two steps is the clear establishment of mutual rights, responsibilities and commitments (financial and otherwise) that each party agrees to assume during project execution. Steps 5 and 6 form the bases for Key Elements Nos. 9 and 10 for both water supply and household sanitation.

Follow-up

48. The draft frameworks for community water supply and household sanitation are to be considered as preliminary. At this point, they are theoretical and conceptual only; they now need to be critically reviewed by potential users in both developing and developed countries, field-tested, refined and modified as appropriate. In addition, expense/investment coverage case studies, with data and experiences translated into common bases for comparative purposes, need to be developed. It is suggested that WHO, within its established international mandate for institutional development related to CWS sector activities, is a logical agency to promote and support the further framework development efforts that are required.

Exhibit IV. Water Supply: Expense Coverage Framework

Step 1. Define application, intended use, required formality of results, and required levels of detail and completeness.

Step 2A. Review 10 key elements of sustainability and revise as required.

2B. Define indicators and units to be used to measure key elements of sustainability, and assess overall quality of information available.

Step 3A. Complete Table WS.1 to gain overview of inputs and timing of inputs required by Agency+ and Community during development and operational phases of project.

3B. Complete Tables WS.1.1 and WS.1.2 to break down required Community inputs during development and operational phases of project into time, skills, materials and equipment, and cash.

3C. Complete Tables WS.1.3 and WS.1.4 to break down required Agency+ inputs during development and operational phases of project.

Step 4A. Complete Tables WS.2.1 and WS.2.2 to quantify Community cash and in-kind inputs required during development and operational phases of project.

4B. Complete Tables WS.2.3 and WS.2.4 to quantify Agency+ budgetary and in-kind requirements during development and operational phases of project.

Step 5. Identify and select sources of required cash and non-cash inputs for (1) Community, and (2) Agency+.

Step 6. Finalize responsibilities, commitments, rights and budgets for (1) Community, and (2) Agency+.

Exhibit V. Household Sanitation: Investment Coverage Framework

Step 1. Define application, intended use, required formality of results, and required levels of detail and completeness.

Step 2A. Review 10 key elements of latrines coverage and revise as required.

2B. Define indicators and units to be used to measure key elements of latrines coverage, and assess overall quality of information available.

Step 3A. Complete Table HSN.1 to gain overview of inputs and timing of inputs required by Ex-Household and Household during development and operational phases of project.

3B. Complete Tables HSN.1.1 and HSN.1.2 to break down required Household inputs during development and operational phases of project into time, skills, materials and equipment, and cash.

3C. Complete Tables HSN.1.3 and HSN.1.4 to break down required Ex-Household inputs during development and operational phases of project.

Step 4A. Complete Tables HSN.2.1 and HSN.2.2 to quantify Household cash and in-kind inputs required during development and operational phases of project.

4B. Complete Tables HSN.2.3 and HSN.2.4 to quantify Ex-Household budgetary and in-kind requirements during development & operational phases of project.

Step 5. Identify & select sources of required cash and non-cash inputs for (1) Household, and (2) Ex-Household.

Step 6. Finalize responsibilities, commitments, rights and budgets for (1) Household, and (2) Ex-Household.

Examples of Completed Tables

49. A number of tables to be completed under Step 3 of the framework process were filled in while proceeding through analyses of generalized cases of community water supply and household sanitation projects. These are presented below for illustrative purposes.

The results obtained are based on collective experience of Group members; they should not be viewed as authoritative, but rather, simply as one group's attempt to systematically analyze what type of inputs are required, when, and by whom for CWS sector projects in general.

The tables included in this section are:

Water Supply:

- * Table 3. Overall Inputs Required for Project.
- * Table 4. Community Responsibility in Development Phase.
- * Table 5. Community Responsibility in Operational Phase.
- * Table 6. Agency+ Responsibility in Development Phase.
- * Table 7. Agency+ Responsibility in Operational Phase.

Household Sanitation:

- * Table 8. Overall Inputs Required for Project.
- * Table 9. Household Responsibility in Development Phase.
- * Table 10. Household Responsibility in Operational Phase.
- * Table 11. Ex-Household Responsibility in Development Phase.
- * Table 12. Ex-Household Responsibility in Operational Phase.

Several points are important to note:

- * The tables are working drafts that were later modified after further discussion. There are slight discrepancies between them and later-version "WS" and "HSN" tables presented in Appendix A as relates to "Time" and "Labour" column headings and certain category ratings. Nevertheless, they are close enough in form and content to later-version tables to provide a reasonable idea of how tables can be completed.
- * Rating system:
 - " - " represents the lower end of the scale, i.e. relatively little or no input required,
 - " *** " represents the upper end of the scale, i.e. relatively great input required,
 - and " * " and " ** " represent values in-between.
- * For Tables 4, 5, 6 and 7, additional notes concerning the last column, "Cash", are included to identify the possible types of cash needs that might be found under this heading.
- * Tables 6 and 11 do not take into account required donor organization cash outlays for direct purchase of programme/project equipment, technical assistance services, etc. This can be done separately.

Community Water Supply

Table 3. Overall Inputs Required for Water Supply Project.
(Corresponds to Table WS.1)

No. Sustainability Element -- Water Supply	Development Input		Operational Input	
	Agency+ Col. 1	Comm'nty Col. 2	Agency+ Col. 3	Comm'nty Col. 4
1 Strong Community institutions	***	*	:	*
2 Appropriate skills	***	*	:	*
3 Coverage operations phase inputs	-	-	:	-
4 Supportive attitudes	***	*	:	-
5 Accepted service levels	**	**	:	-
6 Appropriate technology	**	**	:	-
7 O&M support services, operation	**	-	:	*
8 Community extension services	**	*	:	*
9 Decisions on responsibility	*	*	:	-
10 Execution of responsibilities	***	*	:	*

For detailed breakdowns, see: Table 4, which expands on Col. 2.
Table 5, which expands on Col. 4.
Table 6, which expands on Col. 1.
Table 7, which expands on Col. 3.

Table 4. Community Responsibility, Development Phase, Water Supply.
(Corresponds, with slight modification, to Table WS.1.1)

No. Sustainability Element -- Water Supply	Time	Labour	Skills	Mat'ls/- Equip.	Cash
1 Strong Community institutions	***	-	**	-	-
2 Appropriate skills	**	-	*	-	-
3 Coverage operations phase inputs	-	-	-	-	-
4 Supportive attitudes	**	-	**	-	-
5 Accepted service levels	***	-	*	-	-
6 Appropriate technology	**	-	**	-	-
7 O&M support systems & services	-	-	-	-	-
8 Community extension activities	*	-	-	-	-
9 Decisions on responsibility	*	-	***	-	-
10 Execution of responsibilities	***	**	***	**	*

Possible Types of Cash Needs (last column):

Sustain. Element No. 10 Capital contributions, revolving fund payments, initial contributions to O&M fund, etc.

Table 5. Community Responsibility, Operational Phase, Water Supply.
(Corresponds, with slight modification, to Table WS.1.2)

No. Sustainability Element -- Water Supply	Time	Labour	Skills	Mat'ls/- Equip.	Cash
1 Strong Community institutions	***	-	**	*	*
2 Appropriate skills	**	*	***	*	*
3 Coverage operations phase inputs	*	***	***	**	***
4 Supportive attitudes	**	-	*	-	-
5 Accepted service levels	-	-	-	-	-
6 Appropriate technology	-	-	-	-	-
7 O&M support systems & services	*	-	*	-	***
8 Community extension activities	*	-	*	-	-
9 Decisions on responsibility	-	-	-	-	-
10 Execution of responsibilities	***	-	***	-	*

Possible Types of Cash Needs (last column):

- Sustain. Element No. 1 Travel and subsistence expenses, stationary, office supplies, remuneration to committee members for special services, insurance, etc.
- Sustain. Element No. 2 Travel and subsistence expenses, hand tools for training purposes, other training materials, etc.
- Sustain. Element No. 3 Contributions to replacement funds, operator salaries, spare/replacement parts, fuel, lubricants, chemicals, utilities, transport, tools, etc.
- Sustain. Element No. 7 Agency+ charges for services, equipment, etc., technical assistance from private sector, etc.
- Sustain. Element No. 10 Debt service, etc.

Table 6. Agency+ Responsibility, Development Phase, Water Supply.
(Corresponds, with slight modification, to Table WS.1.3)

No. Sustainability Element -- Water Supply	Time	Labour	Skills	Mat'ls/- Equip.	Cash
1 Strong Community institutions	**	-	***	*	-
2 Appropriate skills	**	-	***	*	*
3 Coverage operations phase inputs	-	-	-	-	-
4 Supportive attitudes	**	-	***	-	-
5 Accepted service levels	**	-	**	-	-
6 Appropriate technology	***	-	***	-	-
7 O&M support systems & services	**	-	***	*	-
8 Community extension activities	**	-	**	*	-
9 Decisions on responsibility	**	-	**	-	-
10 Execution of responsibilities	**	*	***	***	*

Table 6 (continued).

Possible Types of Cash Needs (last column):

Sustain. Element No. 2	Travel and subsistence expenses, Agency+-provided facilities, training materials, supplies, etc.
Sustain. Element No. 10	Engagement of casual labour and/or local contractors, compensation for lands, crops, rights-of-way, etc.

Table 7. Agency+ Responsibility, Operational Phase, Water Supply.
(Corresponds, with slight modification, to Table WS.1.4)

No.	Sustainability Element -- Water Supply	Time	Labour	Skills	Mat'ls/- Equip.	Cash
1	Strong Community institutions	*	-	**	*	-
2	Appropriate skills	*	-	**	*	-
3	Coverage operations phase inputs	-	-	-	-	-
4	Supportive attitudes	-	-	-	-	-
5	Accepted service levels	-	-	-	-	-
6	Appropriate technology	-	-	-	-	-
7	O&M support systems & services	*	*	***	**	*
8	Community extension activities	**	-	**	*	-
9	Decisions on responsibility	-	-	-	-	-
10	Execution of responsibilities	*	-	*	-	-

Possible Types of Cash Needs (last column):

Sustain. Element No. 7	Engagement of casual labour and/or local contractors for major repairs, etc.
------------------------	--

Household Sanitation

Table 8. Overall Inputs Required for Household Sanitation Project.
(Corresponds to Table HSN.1)

No.	Latrines Coverage Element -- Household Sanitation	<u>Development Input</u>		<u>Operational Input</u>		
		Ex-H.H.	H.H.	Ex-H.H.	H.H.	
		Col. 1	Col. 2	Col. 3	Col. 4	
1	Appropriate technology	***	*	:	-	-
2	Support of local leaders	***	*	:	*	*
3	Local awareness	**	*	:	-	-
4	Household priority	*	*	:	-	-
5	Examples of sanitation successes	*	*	:	*	-
6	Appropriate skills	**	*	:	-	-
7	Involvement of women	**	**	:	*	*
8	Community extension services	**	*	:	**	*
9	Decisions on responsibility	*	*	:	-	-
10	Execution of responsibilities	**	***	:	*	***

For detailed breakdowns, see Tables 9, 10, 11 and 12 (for Col. 2, 4, 1 and 3).

Table 9. Household Responsibility, Development Phase, Sanitation.
(Corresponds, with slight modification, to Table HSN.1.1)

No.	Latrines Coverage Element -- Household Sanitation	Time	Labour	Skills	Mat'ls/- Equip.	Cash
1	Appropriate technology	**	-	**	-	-
2	Support of local leaders	**	-	*	-	-
3	Local awareness	***	-	-	-	-
4	Household priority	*	-	-	-	-
5	Examples of sanitation successes	*	-	-	-	-
6	Appropriate skills	**	-	*	-	-
7	Involvement of women	**	-	*	-	-
8	Community extension services	*	-	-	-	-
9	Decisions on responsibility	*	-	*	-	-
10	Execution of responsibilities	**	***	**	**	**

Table 10. Household Responsibility, Operational Phase, Sanitation.
(Corresponds, with slight modification, to Table HSN.1.2)

No.	Latrines Coverage Element -- Household Sanitation	Time	Labour	Skills	Mat'ls/- Equip.	Cash
1	Appropriate technology	-	-	-	-	-
2	Support of local leaders	*	-	*	-	-
3	Local awareness	-	-	-	-	-
4	Household priority	-	-	-	-	-
5	Examples of sanitation successes	-	-	-	-	-
6	Appropriate skills	-	-	-	-	-
7	Involvement of women	*	-	*	-	-
8	Community extension services	*	-	-	-	-
9	Decisions on responsibility	-	-	-	-	-
10	Execution of responsibilities	**	**	*	*	-

Table 11. Ex-Household Responsibility, Development Phase, Sanitation.
(Corresponds, with slight modification, to Table HSN.1.3)

No.	Latrines Coverage Element -- Household Sanitation	Time	Labour	Skills	Mat'ls/- Equip.	Cash
1	Appropriate technology	***	-	***	-	-
2	Support of local leaders	**	-	**	-	-
3	Local awareness	***	-	***	*	-
4	Household priority	*	-	*	-	-
5	Examples of sanitation successes	**	-	*	*	*
6	Appropriate skills	**	-	***	**	*
7	Involvement women	**	-	**	-	-
8	Community extension services	**	-	*	*	-
9	Decisions on responsibility	*	-	*	-	-
10	Execution of responsibilities	*	*	**	*	-

Table 12. Ex-Household Responsibility Operational Phase, Sanitation.
(Corresponds, with slight modification, to Table HSN.1.4)

No.	Latrines Coverage Element -- Household Sanitation	Time	Labor	Skills	Mat'ls/- Equip.	Cash
1	Appropriate technology	-	-	-	-	-
2	Support of local leaders	*	-	*	-	-
3	Local awareness	-	-	-	-	-
4	Household priority	-	-	-	-	-
5	Examples of sanitation successes	*	-	*	*	*
6	Appropriate skills	-	-	-	-	-
7	Involvement of women	*	-	*	-	-
8	Community extension services	**	-	**	*	-
9	Decisions on responsibility	-	-	-	-	-
10	Execution of responsibilities	*	-	*	-	-

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Themes of Working Groups

Working Group I Cost recovery in agency-managed systems
Working Group II Cost recovery in community-managed systems

STUDY GROUP ON COST RECOVERY
IN COMMUNITY-MANAGED CWS SYSTEMS

International Reference Centre for Community Water Supply and Sanitation
The Hague, 21-23 June 1988

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ANNEX IIICOST CONTAINMENT: ISSUES AND RECOMMENDATIONS²Intersectoral action

1. In regions which are difficult to serve, for example as a result of the coincidence of poverty of people and dispersion of habitat, the combined action of CWS and other sectors is often conducive to reductions in cost. Dispersed dwellings represent in many countries 30% to 90% of total population, and their demand may be for software rather than hardware; they are primarily in need of quality surveillance and health education, and other services based on intersectoral cooperation, particularly with agencies of Local Government, Public Health, Education and Agriculture. In this context the provision of hardware should not take place on a systematic basis, but rather be motivated by the health status of the populations concerned.

2. Intersectoral action is also 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.

Decentralization

3. Decentralization can occur in the form of "deconcentration" (of the central agency towards 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 Health agencies are usually more deconcentrated. Integration of CWS and other elements of Primary Health Care (PHC) can therefore serve as support to decentralization.

4. 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. Community participation provides opportunities for reducing 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.

² Abstracts from document WHO/CWS/87.5 "Report of the Second Informal Consultation on Institutional Development - Geneva, 5-9 October 1987".

Some limits to decentralization

5. Deconcentration of hardware providers is difficult, as the general scarcity of resources is compounded by logistic constraints. There appears to be a limit beyond which construction, operation and maintenance unit costs become so high as to offset the benefits of the process. Some countries have for instance adopted a central Fund arrangement to channel surplus funds from urban to rural areas; however, the costs of deconcentrated structures may exceed the amounts thus made available.

6. 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. 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 CWS.

Divestiture

7. 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 and increasing their power. Clearly 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.

Some limits of divestiture

8. Matters of public interest can generally not 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 locally available resources, and that the company can remain viable without charging exorbitant prices to other sectors of the economy (e.g. industry or tourism).

9. 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 generate a surplus to meet service expansion needs. All of these objectives can be pursued concurrently by a public institution, at the risk of being subsidized for its operating deficit.

10. By contrast, a private company should as a priority remain creditworthy, pay its staff and maintain a satisfactory service level. Provisions are therefore required to monitor and control the activities of these private entities as well as foster their development. Alternatively, their mandate can be restricted to operation and maintenance activities, with or without

commercial risk. 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 CWS, 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 Office in Kenya) is also warranted, together with a study of social aspects, such as why user groups and cooperatives sometimes run standposts, instead of private vendors.

Preventive maintenance

11. 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.

12. The premature replacement or rehabilitation of equipment which has not been properly maintained involves the utilization of scarce funds which could perhaps have been employed to extend CWS services to more people. But it is important in some cases to consider the problem of intermittent water service in small urban and rural areas. In some developing countries, most 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.

13. In most urban systems however, expected improvements in the reliability of the supply provide a valid argument in favour of preventive maintenance. Tariff structures are often designed to subsidize the poor, with the expectation that large consumers can be charged higher rates; this may not happen because the large consumers' group does not grow as fast as the low-income consumers' category, or more commonly because of capacity constraints and high NRW, intermittent service, which encourage large consumers, particularly industry, to build their own private supplies.

Metering and minimizing non-revenue water

14. Indiscriminate metering in small urban systems may not solve problems which are generally related to poor operation and maintenance. As mentioned in the cost recovery options, it may be prudent to reconsider the flat or rather graded rate concept as an alternative to total metering, particularly in the case of weak institutional set-up and insufficient technical and organizational capability. 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. In all cases, local conditions and acceptability by the community of the proposed changes should be fully taken into account.

15. The high level of non-revenue water is frequently due to high physical leakage requiring improved maintenance, but also to the large numbers of defective or inoperative distribution meters and illegal connections, and to the fact that in the absence of reliable master meters, production can only be estimated, and such estimates are usually on the high side. Some of the arguments for and against metering can be summarized as follows:

- 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.

16. On the whole, 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.

ANNEX IV

COST RECOVERY: ISSUES AND RECOMMENDATIONS³

Equity

1. 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. An equitable tariff is also one which does not penalize large consumers to such an extent that it may indirectly affect the use of any national resources which would remain idle if these consumers ceased to exist.

2. In this sense, full cost recovery may be the wrong description of a sound objective. It has a financial connotation implying that the transactions which occur on the water market are limited to transfers of water in exchange for cash payments. What it actually means is that the economy as a whole should recover all of its investment in the sector in the form of health and other benefits, including cash income. In the latter sense, if water benefits everybody, everybody should pay for it, but not necessarily the same amounts, in the same manner, or at the same time.

3. The misplaced concept of free water is still in use in many countries, with politicians advocating equity and philosophers arguing that human rights to water were recognized in the most ancient cultures. Some countries also subsidize water for public use, so that governments have free water, then compensate by subsidies for revenue lost by public utilities. Water as a public commodity should be available to all. 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.

Feasibility

4. Where the concept of free water has been rejected, tariff structures are designed to mobilize resources from all those who benefit from the service. It is therefore important to determine where exactly these resources are, and whether they are adequately distributed and sufficient in total to assure that revenues cover costs. Changes in fiscal or technical policies are usually costly and irreversible, and they should therefore be directed at key factors which affect income.

5. An important contributor to revenue is the fast-growing low-income / low-consumption category served by social connections or public standposts. 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.

³ Abstracts from document WHO/CWS/87.5 "Report of the Second Informal Consultation on Institutional Development - Geneva, 5-9 October 1987".

6. 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. In some countries however, 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.

7. Other solutions for low-income urban areas include group connections, cooperative standpipes, concession sales by female heads of households who have no other source of income and can also give hygiene education, and small autonomous neighbourhood systems such as handpumps. Other important contributors include large and intermediate consumers. Since a substantial part of the tariff burden can be absorbed by large consumers, it is essential for a water utility to ensure that all large meters are in working order; water rights and private supplies should also be checked.

Rules of thumb

8. In the design of an urban/urban poor tariff structure which would meet rational utility revenue objectives, the following rules of thumb may often apply: (i) the public standpost service should be financially autonomous, with an average tariff to the concessionaire (entrepreneur/community organization/water supply agency) equivalent to the variable costs of supplying these connections; the rates should be such that at no time, the financial situation of the agency can improve by closing these facilities; (ii) large consumers should pay at least the long-run marginal cost of water, in which full account is taken of external diseconomies and resource scarcities; (iii) the average tariff should be at least sufficient to ensure that all cash needs are covered (liquidity maintenance concept); (iv) 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 fully covered by a levy on water use; the only exception that should be made is water used to cover minimum human requirements. This levy should also be applied in the case of private abstraction of water.

Social and public health aspects

9. Well-designed tariff structures have three major aspects and benefits: (i) their social component allows for extension of the service to the less privileged; (ii) their progressive aspect discourages excess use and waste; (iii) they allow for gradual extension of the service as demand increases. Thus, their overall benefits in terms of public health and social welfare are threefold: (i) they help in providing equal access to a commodity which is essential to health; (ii) they help in the protection and conservation of a scarce resource, and the sharing of its benefits by a larger part of the population; (iii) they help in maintaining the continuity of the service, and expanding it to match increases in population and water demand.

Issues in rural CWS

10. A major issue concerning CWS in rural areas is the willingness of the community to accept new responsibilities in the management and operation of water systems: users may refuse to pay for water on the belief that water services should be provided free by the government. Intensive education and training programmes at community level (especially young people) are thus required, and the agency should negotiate, rather than impose the devolution of

responsibility to the community, which should play a role in project planning and implementation.

11. More generally, improvements in cost recovery in rural areas require an evolution within the community, with behavioural changes corresponding to the acceptance of a new responsibility and the activation of an organization to fulfill it; because they are poor, rural communities have multiple priorities; because they are dispersed, they have difficulties in organizing themselves for the attainment of long-term goals; as a result strong resilience is common: the community lends itself to change, then reverts to its precedent behaviour; satisfactory cost recovery schemes temporarily suspended after a disastrous harvest may never be resumed again; malfunctions of pumps may even never be reported.

12. Although it is sometimes argued that the amount which people are willing to pay for water can be used as a proxy for their demand, villagers may have very high water needs and still object to cash payments; cash income is scarce in many rural areas and there is no evidence that rural dwellers will not continue to drink water at no expense from traditional sources in order to save their cash income for the acquisition of those goods which cannot be purchased without money.

Autonomy (and divestiture)

13. The autonomy objective is essentially a financial one, as it requires that the water utility operate in a breakeven situation, meaning that average tariff, or better average real income, should equal average cost, which may be limited to the cost of providing a service from existing assets to an existing clientele or extended to the cost of maintaining on a permanent basis the provision of a service, including its expansion as demand grows. This broad distinction gives an indication as to what can be delegated to the private sector and what should remain primarily the concern of government:

- where there is no anticipated growth in demand which might exceed the capacity of existing assets, the sector can be financially autonomous if tariffs cover operation and maintenance costs; a private company can be licensed to operate and maintain existing works; *if the units will never need to be replaced...*
- if a private company is licensed to build, operate and maintain water supply works, it will add to its tariff some proportion of the acquisition and construction costs of assets in operation;
- in a situation where demand is expected to grow continuously, the tariff should comprise not only the costs of operating and maintaining the system, but also a provision for future replacement and development costs;
- this provision is constituted by incorporating in the tariff an allowance for depreciation and a rate of return, both calculated on fixed assets in operation, not at their original acquisition or construction value, but at current replacement cost.

14. One important aspect of the objective of financial autonomy of CWS as a whole is that the water bill should be increased to provide for sanitation needs, especially for the disposal of used water. This usually results in high selling prices in this sector.

Efficiency and expansion

15. Tariffs conceived as above 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, tariffs should be adjusted to reflect the value of water to the economy as a whole rather than to the utility.

16. On the consumption and cost recovery side, tariffs will be both effective and efficient if they take into account the fact that most people must have water at low cost: differential tariff structures should therefore be implemented to subsidize the poor; the potential for cross-subsidies is however limited: half of all water produced is unaccounted-for: the water sector is a unique case of loss of this magnitude, and therefore provides a unique opportunity for highly cost-effective improvements.

Note on revolving funds

17. Revolving funds can 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. While the technical soundness of these accounting and planning methods is beyond question, their 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.

18. If due account is taken of inflation to reflect in the cost price of water realistic depreciation allowances and provisions for extensions through revolving fund arrangements, average tariffs may become so high as to defeat the purposes for which renewal and extension funds were created. They may exceed the thresholds of consumers' willingness to pay for the service.

19. 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.

20. The operation of a revolving fund requires a delivery system to transfer resources from larger urban centres to medium-size towns and eventually to rural areas. Vehicles to channel such resources and structures to monitor their use are often absent or deficient, beyond the limits of decentralization of national water agencies. Centrally-managed public utilities are generally reluctant to extend their activities to small agglomerations as this will tend to lower their financial performance.

21. Where revolving funds are feasible, they have the merit of forcing the sector into a disciplined and reliable organizational framework. While they do not generate resources, they can act as catalysts and long-term regulators. They also give a better chance to agencies to break even. 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 ensure their continuous financial performance, and in particular that all surplus income generated in the sector be earmarked to ensure that revolving funds do revolve.

COST CONTAINMENT AND COST RECOVERY

IN AGENCY-MANAGED SYSTEMS:

ISSUES AND CASE STUDIES

Source - Report of the Second Informal Consultation on Institutional Development - Geneva, 5-9 October 1987. Document WHO/CWS/87.5. All case studies and issue papers were prepared in 1987.

COST RECOVERY ISSUES IN URBAN CWS
(by M.T. Summerfield, Independent Consultant)

(i) Impact of local politics on water tariffs: urban water and sewerage authorities are often semi-autonomous organizations whose actions on tariffs are subject to final approval by their own board of directors (which often include local politicians), local municipal/metropolitan councils, provincial governments and central governments. These political influences often result in postponement, reduction and/or cancellation of proposed tariff increases. This leads to increasing financial losses which can result in default on debt obligations, greater reliance on subsidies and a decline in the service provided. There is a need for greater political awareness that appropriately justified tariff increases should be permitted.

(ii) Supply and demand management: greater emphasis should be placed on the concepts of supply and demand management, by encouraging a policy of reduction in unaccounted-for water (leakages, illegal connections, metering and billing problems), the use of physical controls to restrict supply where appropriate, and the control of consumption through education and price mechanisms (i.e. appropriate tariff structures). Two aspects which deserve specific mention are: standards of construction (low construction standards lead to high losses) and knowledge of the water market (through accurate meter reading and regular sample surveys of household water consumption).

(iii) Adequate financing of sewerage: sewerage operations are often given low priority, and there is only a nominal charge or none at all; sewerage can impose high operating costs and often accounts for a large proportion of the financial deficit of an urban water and sewerage authority.

(iv) Improved financial planning with target setting: this would provide a more effective framework for senior managers to control the operations of the organization and for other agencies (local, national and international) to monitor performance within, say, a 5-year planning horizon.

(v) Financial problems created by foreign exchange losses and rate of return covenants: in the last 10 to 15 years, large foreign currency loans made directly to water supply enterprises by international lending agencies have created significant financial problems, as the value of the local currency declined in relative terms, and the rate of return requirements based on annual revaluations of operating assets often imposed unattainable targets on water and sewerage authorities.

(vi) Alternative sources of investment finance: sources of finance which could be explored include: equity participation from public and private sources: this implies the need for regular measurable improvements in financial performance in order to pay an annual dividend; capital contributions from beneficiaries: target groups (e.g. industry, development authorities, etc.) should have sufficient capital resources and willingness to contribute (in exchange for reduced service charges over a defined period).

(vii) Human resources - skill availability, training and salary levels: the availability of skilled manpower at all levels is crucial for financial management and proper cost control. It requires appropriate selection procedures, training, career development programmes and competitive salary structures.

ANNEX V/IICOST RECOVERY OPTIONS FOR LOW-INCOME URBAN POPULATIONS

(by C. van Wijk-Sijbesma, IRC/CWS)

The common practice of subsidizing CWS in high-income urban areas implies that less funds are available for extensions towards rural and urban-fringe zones. Steeper progressive rates in residential and industrial districts would make it possible to recover costs, leaving funds for basic CWS services in lower income areas. Indeed, until high-income urban consumers pay the cost of CWS, the rural and urban-fringe dwellers, who generally have much lower incomes, can hardly be expected to contribute to the running costs of their own services. Possible financing methods include mixed systems with standposts cross-subsidized by paid house connections, and unmetered group connections with flat or graded rates.

Group connections are particularly suitable where strong social ties already exist within small groups living close together. Payment of flat rates for these group connections means that the households who are members of the group all pay an equal part of the overall charge; this tends to penalize low-income households. An alternative is therefore to introduce graded rates, with households classified into rate categories, based on estimated differences in water use and income. The advantage of graded rates is that they reflect volume used and payment capacity, without having to install and read water meters. Such rates have for example been introduced in several towns in Colombia. The Puerto Asis water supply scheme provides a good example of a graded structure based on estimated property values.

A major constraint in piped systems is the high connection fee. Programmes in several South American countries and in the Philippines include connection loans enabling households to pay back the connection charge as part of their monthly water rates. Another method frequently used in low-income urban areas, particularly in Central and South America, is to give users the opportunity to do all the unskilled construction work by themselves, in exchange for a free connection or other advantages.

Selling water at standposts or through concessionaire-households can also increase revenue. However, it usually means much higher costs to the users than with yard or group connections, and the users are vulnerable to exploitation in times of water shortage. Water selling is therefore particularly indicated in special circumstances, such as when:

- a traditional vending system already exists which can be improved and provides better quality water at an acceptable price;
- a piped water supply or other appropriate water development is not feasible for economic or technical reasons; this is for example the case in urban areas where low-income neighbourhoods are situated on steep slopes above the main city;
- a piped water supply is ruled out by political authorities, for example, in unauthorized settlements; agency or cooperative kiosks may be more acceptable because they are less permanent, generate income and reduce public health risks.

Finally, closely-knit low-income urban neighbourhoods and settlements can be assisted to set up a semi-autonomous or autonomous system in their area. Thus, user associations in Latin American cities buy their water at a metered point and distribute it with their own resources.

WATER DEMAND MANAGEMENT IN CITIES OF KENYA, PAKISTAN AND SYRIA

(by M.T. Summerfield, Independent Consultant)

Urban water and sewerage authorities in developing countries are expected to provide an effective and efficient public service which meets present and future needs, and is financially self-supporting. Many of these authorities have been established within the last 10 to 15 years with the support of international lending agencies who have provided training, technical assistance and capital funds for construction works. One of the prime aims of this development was to create semi-autonomous agencies which are dedicated to improving and expanding urban water and sewerage services. The duties and functions of these authorities are often embodied in specific legislation, which includes an obligation to maintain adequate financial records and the right to levy appropriate tariffs. In most urban water and sewerage authorities, tariffs are regarded as nothing more than a source of revenue. This fact ignores their importance as an instrument of demand control and evokes significant reaction from local politicians when increases are proposed.

There are a number of cities where tariffs could and should be used more effectively as instruments of demand management and where political factors influencing the setting and approval of tariff increases should be minimized, for instance: Nairobi (Kenya); Karachi, Lahore and Hyderabad (all Pakistan); and Damascus (Syria). These cities are faced with the increasing capital cost of conveying water from sources which are a greater distance away or becoming increasingly depleted. Urban growth demands improved access to potable water and, almost inevitably, large new capital works are seen as the only solution. Some of the cities have tried to reduce the proportion of unaccounted-for water, but none have used tariffs as a means of demand control. The high cost of new construction works demands that urban water and sewerage authorities should increase their efforts to minimize the use of existing resources, including the adoption of a policy of demand management.

Political influence on the setting of tariffs is prevalent in all five cities. The inability to secure adequate tariff increases has led to increasing financial losses, and in some instances, an increase of 50% or more would be required to restore financial stability without covering accumulated debts. The interim solution has been to provide increasing subsidies and/or to adjust the capital and debt structure by converting loans to equity and debt rescheduling. However, if the objective of financial independence is to be sustained and future losses avoided, then regular realistic tariff increases should be approved.

In most authorities there is no single department which combines the functions of research, planning and policy review. A possible solution would be to establish a Development Planning Unit reporting directly to the managing director or chief executive. This unit would be responsible for carrying out basic research and preparing policy documents for executive action. One of its tasks would be to study the relationship between tariffs and water demand, and to make specific recommendations aimed at controlling demand particularly in the domestic high income category. The establishment of such a unit would require training of both the personnel directly involved and the senior managers who would be responsible for implementing the unit's recommendations.

ANNEX V/IV

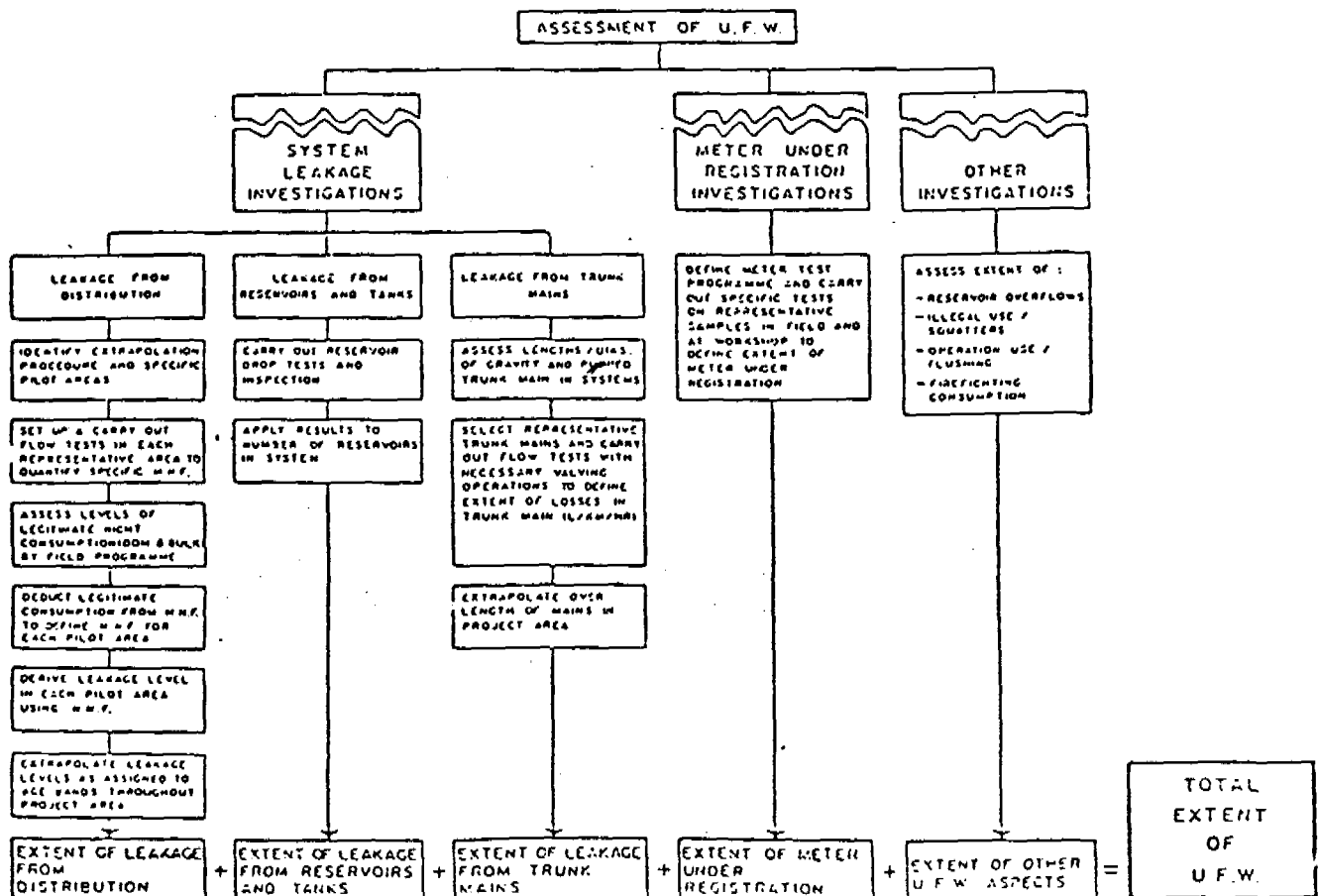
ASSESSMENT OF NON-REVENUE WATER IN MALAYSIA

(by A.J. Price, John Taylor and Sons, Consulting Engineers)

Unaccounted-for water (UFW) or non-revenue water (NRW) comprises losses of water incurred by leakage, wastage (overflows), and meter under-registration. Petaling Jaya town (Selangor State, Malaysia) has developed over the last 35 years from an early resettlement area, into a large well planned overspill satellite town to the capital city of Kuala Lumpur. It is primarily residential in nature, although having a significant amount of industrial premises. The area is supplied from two regional sources, having a water production to the area of approximately 140,000 m³/day and serving a population of 250,000 through 50,000 metered connections. The total estimated NRW in the project area can be summarized as follows:

- distribution leakage	23,670 m ³ /d
- trunk main losses	2,392 m ³ /d
- reservoir losses	negligible
- firefighting	475 m ³ /d
- squatters & illegal use	3,327 m ³ /d
- operational use & reservoir overflows	negligible
- meter under registration	
(a) 24% domestic sales	15,120 m ³ /d
(b) 20% bulk sales	5,400 m ³ /d

Total estimated NRW 50,384 m³/d

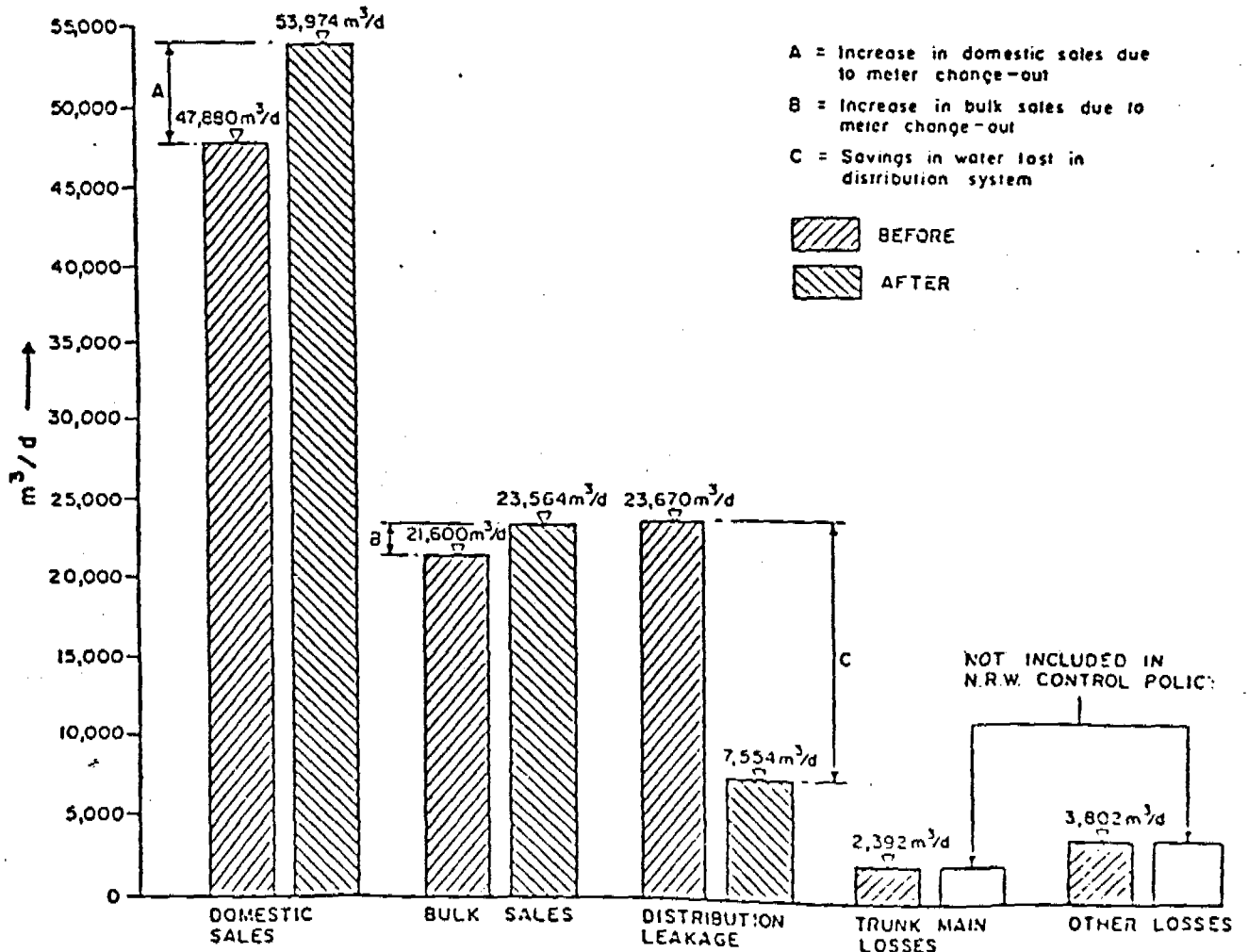


REDUCTION OF NON-REVENUE WATER IN MALAYSIA

(by A.J. Price, John Taylor and Sons, Consulting Engineers)

The NRW Control Policy recommended for Petaling Jaya results in savings from leakage reduction and from revenue metering as direct benefits, and some indirect benefits, such as:

- increased efficiency of the supply and distribution functions;
- improved knowledge of NRW levels as a tool for management decisions;
- increased consumer satisfaction due to improved response-time in repairs and generally improved control of system pressures;
- leakage levels reduced to their optimum economic minimum by implementing combined metering control methods whilst carrying out visual inspection and sounding throughout Petaling Jaya to rapidly control NRW levels in the short term;
- maximization of amount of revenue collected, by ensuring that the metering policy is improved in terms of reducing the level of under-registration;
- increased awareness and effectiveness of staff through in-house and on the job training;
- adjustment of present organization to accommodate the NRW functions to ensure its implementation and long term effectiveness.



ANNEX V/VI

COST RECOVERY AT PUBLIC STANDPOSTS IN BURKINA FASO
(by J.-P. Thevenon, Compagnie Générale des Eaux)

The urban population of Burkina Faso is supplied with water through a mix of private connections and public standposts: the cost of a private connection is equivalent to two months' salary, the distribution systems are not dimensioned to accommodate large volumes of water, and there is no sewerage system.

During the last four years, the Office National de l'Eau et de l'Assainissement (ONEA) has increased the number of standposts to 570, thereby raising to 21% the ratio of water supplied through standposts to total water consumed. During the same period, the water authority implemented a tariff structure with some income derived from sales at the standposts; these are subdivided as follows:

- 540 standposts which draw their water from the communal system; the tariff is equivalent to that applied to private connections for consumptions of less than 10 m³ per month, including a sanitation surcharge of 5%;
- 30 public standposts which are "self-supplied", in the sense that they draw water from a borehole with a diesel- or electricity-driven pump, and each has a 6 m³ water tank; tariffs amount to half of those of conventional standposts (energy costs are paid separately to suppliers).

In the early 70s, standposts were managed by municipalities, which resulted in financial problems for ONEA. Today, standpost keepers are directly linked to ONEA by contractual agreements; they are considered as ordinary private consumers, but with the responsibility to supply water to the low-income population. In Ouagadougou, some standposts are managed by associations, e.g. Union des Femmes du Burkina, or Union des Anciens du Burkina.

Due to the limited outreach of most urban water systems, especially in the capital city of Ouagadougou, water used to be bought from standposts and from some private consumers and redistributed in the periphery. Water vendors tend to become rare now that the number of standposts has increased. The maximum resale price should not exceed 150 CFAF per barrel of 200 liters. In practice, it is slightly higher, so that the average tariff from water vendors corresponds to about five times the average tariff of the connection/standpost mix, which is about 160 CFAF per cubic meter. Before 1983, the same barrel was sometimes sold at 800 CFAF (4000 CFAF/m³).

For the entire Ouagadougou system, the ONEA staff in charge of standposts comprises one cashier, one plumber/meter reader and one labourer. Each standpost keeper receives an invoice once a week; the disconnection of all standposts in arrear occurs on Monday morning, and all unpaid bills are usually recovered within three days. The weekly revenue of standposts keepers averages from 3000 CFAF to 39,000 CFAF with a medium value of 11,000 CFAF. This revenue is higher for self-supplied standposts, with a medium value of 37,000 CFAF. The revenue of water vendors is of the order of 3500 CFAF per week.

Currency CFA franc (CFAF) - US\$ 0.003; 1 US\$ - 302 CFAF.

USE OF THE LIQUIDITY APPROACH IN INDONESIA
(by H.C. van der Mandele, IWACO, Consulting Engineers)

Water rate policies can be based on economic and social criteria. An example of the first is incremental cost coverage using factor prices that reflect resource shortages in the economy, while external benefits such as savings in health care are subtracted. An example of the second is provided by cross-subsidy systems. Whatever the criteria however, financial needs set limits to rate levels, and these limits are normally calculated through financial cost analysis. Cost coverage is a rough indicator that operations will not suffer from a temporary or permanent shortage of cash to cover expenditures for operation, maintenance, replacement and interest.

However, rate levels based on financial costs are sufficient only as long as the water utility can borrow as much money as it needs whenever a temporary liquidity shortage occurs. In most countries, it is neither feasible nor acceptable for water rates to fluctuate immediately and fully with cost levels; therefore, rate policies take into account a levelling out of annual changes. For such cost models to be appropriate, the water utility should deposit temporary liquidity surpluses into accounts with interest rates at least equal to rates of inflation. At the same time, these accounts should not be at risk of being appropriated by the authorities for other purposes. A third condition is that rate increases be applied in a timely manner so as to cover higher costs caused by inflation. It is well-known that such conditions are seldom met. By contrast, in many developing countries, water supply facilities are financed through very soft loans or grants, so that water rates calculated on the basis of total costs are more than sufficient for financial viability.

Because of this inability of the cost model to provide a meaningful simulation of future cash flows, the "liquidity approach" was used to prepare a feasibility study for the water system of the rapidly growing town of Bogor, West Java, Indonesia (1987 population: 650,000). Indonesian water utilities can borrow long-term funds only to increase capacity or to finance extensive rehabilitation programmes. Procedures are long and complicated. It is also very difficult to borrow to cover temporary liquidity shortages. Thus cost levels give little indication of rates needed to ensure liquidity. The financial analysis of the Bogor project started with an estimation of the minimum liquidity level at the end of each financial year, consistent with effective and efficient operations.

Taking into account the seasonal fluctuations in liquidity and the fact that at least some reserves should always be available, this minimum was estimated to be 15.5% of the total cash outflows. The rate level needed to reach this minimum liquidity level should be significantly higher than total costs, by 10 to 30%, mainly because of increases in working capital requirements and differences between assets depreciation and loans amortization. As a result of applying this rate level, net income before taxes will be 55% of total operating revenues (with depreciation based on replacement costs). Apparently, rate policies based on liquidity maintenance are easily accepted by governmental authorities who are generally used to applying cash figures rather than cost considerations when preparing their budgets.

ANNEX V/VIII

CWS ORGANIZATION IN THE PHILIPPINES

(by G.E. Montrone, Carlo Lotti & Associates, Consulting Engineers)

The 40,000 barangays (basic administrative units) of the Philippines are provided with three levels of water supply service depending upon the community's ability and willingness to share in costs and responsibilities. Level I is generally a protected well with a handpump, or a protected spring; level II is a communal standpipe system; level III is a piped system with individual metered connections. Sanitation facilities range from latrines (levels I and II), to septic tanks (level II), and to installations connected to septic tanks, or to conventional sewerage systems (level III). Various institutions are involved, and there is some overlap at each one of the three levels.

The cost recovery scheme of the Metropolitan Manila Waterworks and Sewerage System (MWSS) is based on the principle of financial viability. Tariffs are calculated to cover all operation and maintenance costs including depreciation, and to meet debt-service requirements. The combined water and sewerage tariff averaged PS 3 per m³ as of October 1986. It is multiplied by a coefficient of 1.6 to account for charges for sewerage and environmental protection. The combined water and sewerage charges generally do not exceed 2% of the household budget of low-income families. New water connections are installed free of charge. Like private connections, public standposts are metered and their consumers pay a tariff based on domestic rates.

The other urban centres of more than 20,000 inhabitants are served by the Water Districts (WDs) which are assisted by the Local Water Utilities Administration (LWUA). The WDs are required to be financially self-reliant. Water tariff structures are calculated to ensure that low-income families do not pay charges in excess of 5% of their income. The financial viability of LWUA depends primarily on the capability of WDs to meet their debt service obligations. Loan repayment efficiency of the largest WDs has considerably declined in recent years, resulting in a chronic cash deficit; this is due in some cases to low water rates, and in other cases to inadequate water service resulting in low sales volume.

The Rural Water Works Development Corporation (RWDC) is the main institution in the rural subsector, where financing terms are different for each service level, with government subsidizing nearly entirely level I facilities as well as the source development works for level II systems, while associations of community members (RWSA) pay the full capital cost of distribution networks for level II systems, and the entire cost of level III systems. For level I systems, the water charges cover only minor repair and maintenance costs and normally range from PS 1 to PS 2 per month. In many cases, these fees are not collected. For level II systems, monthly charges are set to cover the amortization of the loan for the construction of the distribution system, the depreciation of pumps and motors, the monthly electric consumption and other operation and maintenance costs including salaries and wages. The monthly charges range from PS 22 to PS 25 per household, or about 2 to 3% of the monthly income of a poor family. Water rates for level III systems are intended to cover all operating and debt servicing costs and allow for reasonable profit; the tariff structure is such that the larger consumers provide a cross-subsidy to the smaller ones, as that the poor pay less than 5% of their income for water.

Currency Peso (PS) - 0.05 US\$; 1 US\$ - 20.4 PS

COST RECOVERY IN THE PHILIPPINES

(by G.E. Montrone, Carlo Lotti & Associates, Consulting Engineers)

Since it started operations in 1980, RWDC has shown low collection efficiency. As of the first quarter of 1986, the amounts collected represented 28% of billings at level II and 38% at level III. There are about 1000 level II systems in the country which have not been paying any debt service as a result of the absence of loan documents.

In order to encourage all families to install household toilets, the Department of Health provides toilet bowls free of charge; the families install them with their own resources, under the guidance of trained sanitary inspectors. Community inputs include the digging of the toilet pit, provision of the superstructure, wooden platforms and pit linings, and are estimated to have a value of about 50% of the total unit cost of the project.

The level of non-revenue water is high everywhere (50% average during the last 17 years, 65% in early 1977 in metropolitan Manila). The financial viability of MWSS will probably be improved after construction of the recently approved extension of distribution facilities, which should increase revenue by about 25%; however, it remains dependent on the outcome of the on-going rehabilitation project, which is expected to reduce non-revenue water to a low level of 25% in 1990. The financial viability of LWUA is dependent on that of WDs; most small municipalities cannot pay the interest costs of LWUA loans, although these have recently been reduced to about 10%. LWUA is therefore unable to service its own debts to the Government, and does not obtain new Government contributions to equity. As to RWDC, a serious problem facing the rural programme is the failure to incorporate as financing source a credible amount of local equity, without which the water systems continue to be viewed as free gifts from the Government, and the community's involvement is much less than anticipated in terms of maintenance and debt-servicing.

A very high proportion of the rural population can afford the water charges for level I systems, and a good proportion can afford level II systems; very few rural communities can afford to pay for level III systems. Besides, the willingness to pay is substantially lower than the estimated ability to pay: poor families are generally not willing to pay a water bill amounting to 5% of their monthly income. The difficulty resulting from the reluctance to repay loans is compounded by the strong desire of most communities to enjoy the benefits of a high service level.

One of the issues that the new Government of the Philippines is currently addressing is the difference in water rates between various systems; consumers within LWUA service areas generally pay a higher price for water than the metropolitan Manila consumers or those in the rural areas with a level III system. The price paid in some areas serviced by LWUA can thus reach more than 3.6 PS per m³, while in the same consumption brackets Manila consumers pay 2 PS per m³, and level III consumers of rural areas pay less than 2.4 PS per m³.

ANNEX VI**STRATEGY FOR OPERATION AND MAINTENANCE DEVELOPMENT AND
OPTIMIZATION OF COMMUNITY WATER SUPPLY AND SANITATION SYSTEMS**Background

Defective operation and maintenance (O&M) has been identified as a major constraint in the community water supply and sanitation (CWS) sector. The present situation in CWS is characterized by funding limitations, inadequate cost recovery, inadequate operation and maintenance, and lack of trained personnel. As a result of waste of water, misuse of existing facilities, high unaccounted-for water, high operational costs directly influencing tariffs, and poor quality of water delivered to those who are served, it becomes difficult or impossible to extend CWS services to those who live in less-privileged urban poor or rural areas, without any public facility, therefore highly exposed to health risks.

Programmes of O&M and optimization of water supply and sanitation systems are aimed at improving the efficiency of institutions to achieve the best possible utilization of the existing capacity of the systems:

- by reducing water losses it will be possible to extend coverage without constructing new production facilities;
- by increasing water revenue, by reducing operational costs and by postponing investments for the ampliation of the production works, it will be possible to shift financial resources to extension of coverage to fringe, poor and rural areas;
- as a result of improved O&M of piped networks and treatment plants, water quality can also improve. Risks of contamination in distribution systems due to intermittent service, negative pressures and inadequate operation can be minimized.

Operation and maintenance programmes

A thorough survey of the water and sanitation agency would lead to the formulation of priority programmes as follows:

- Operational Development Programme (which comprises projects in the following areas: operation of water supply systems; maintenance of water supply systems; metering and billing);
- Programme for the Improvement of O&M of Sewerage Systems;
- Programme of O&M and Optimization of Treatment Plants.

The formulation of such programmes should include support projects related to the administrative, planning and financial areas.

Source Draft Strategy Paper for Operation and Maintenance Programmes,
CWS, WHO Geneva, 1988.

Although this approach is not intended to result in the preparation of rigid or standardised projects for universal application, an attempt should be made to foresee all possible, frequent and common problems and to design solutions. Then, each programme formulation should be adapted to meet the specific requirements of the water agency concerned.

In order to facilitate and provide a uniform level in personnel training, the development of instructional material is required. A number of training packages should be prepared for each specific application. It will thus be possible to assemble a complete set of packages which will meet the requirements of a specific water agency by selecting the required modules.

Stages of operation and maintenance programme development

- Promotion of O&M Programmes. The first important action to be taken with water agencies is to generate awareness of the significance of the programme and willingness to implement it.

- Formulation of O&M Programmes. It should be undertaken once a political decision supporting such an initiative has been achieved. The formulation comprises the identification of a national coordinating agency, the organization of the sector to implement the programme, the assessment of existing CWS services, and the definition of priority programmes, projects and activities with respective costs and required resources (human, financial, equipment, materials, vehicles and installations).

- Implementation of O&M Programmes. It should be undertaken with the coordination of a leading national sector institution, initially in a few water agencies. Depending upon the country's experience of similar programmes, an external project manager may be required.

- Training Activities. They should be supported by training packages to facilitate the technology transfer process. The training activities should be included in the programme's implementation strategies and linked to the managerial and operational activities. The courses/ workshops/seminars will be directed to managers, engineers and technicians. This initial target staff is expected to become a core group for developing human resources.

O&M Programmes in Latin America

From the beginning of the O&M programme's implementation in 1977 to the end of its first phase in 1982, unaccounted-for water in Sao Paulo, Brazil, was reduced from 36 to 26%. The number of house connections increased from 1.023 to 1.423 million. Water produced increased from 22.3 m³/sec. in 1977 to 25.4 m³/sec. in 1980 and was reduced to 25.1 m³/sec. in 1980, which made it possible to extend coverage to an additional 2.0 million inhabitants in fringe and poor areas with a relatively small increase in water production (billings increased from 14.3 m³/sec. in 1977 to 19.6 m³/sec. in 1982). Similar programmes were implemented in all the Water and Sanitation State Authorities of Brazil, and more recently, in a number of water agencies in other countries of Latin America.

ANNEX VIIROLE OF EXTERNAL AGENCIES⁴

1. External agencies can assist in CWS development by:
 - emphasizing in their dialogues with governments the crucial importance of liquidity maintenance and of sustainable projects;
 - emphasizing the role that women can play if they are properly involved;
 - assisting governments in the development of project plans that emphasize satisfaction of felt needs, and appraising projects on their potential to meet these needs and be sustainable;
 - accepting that achievement of CWS takes time, and is a human-oriented, not hardware-oriented process;
 - accepting greater flexibility in project plans, time frames and budgets;
 - requiring that project activities be monitored and evaluated using indicators that reveal how well felt needs and sustainability criteria are being satisfied; the community should be involved in the evaluation process.

Note on ILO activities in CWS

2. The International Labour Office (ILO) is generally interested in the creation of employment opportunities. Currently some major areas of ILO activities are:

- SPWP - Special Public Works Programme.
- SBE - Small Business Enterprises.
- Rural development.
- Management of public utilities.
- Training.
- Environmental management.
- Cooperatives.
- Maintenance.

The issue of cost recovery is dealt with in ILO programmes, and the general policy is as follows:

- autonomy of the water agency is a prerequisite of financial viability;
- management should be motivated towards efficiency; the concept of financial management should be stressed;
- a positive cash balance should be maintained;
- there should be cultural acceptance to cost recovery;
- maintenance should be the responsibility of all involved parties.

⁴ Abstract from Document WHO/CWS/87.5 "Report of the Second Informal Consultation on Institutional Development", Geneva, 5-9 October 1987.

FINANCING OPTIONS FOR PIPED SYSTEMS

(by C. van Wijk-Sijbesma, IRC/CWS)

ANNEX VIII

<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	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

COST CONTAINMENT AND COST RECOVERY
IN COMMUNITY-MANAGED SYSTEMS

ISSUES AND CASE STUDIES

Source Document WHO/CWS/87.5 "Report of the Second Informal Consultation on Institutional Development", Geneva, 5-9 October 1987.
All case studies were prepared in 1987, except Lesotho and Thailand.

ASPECTS OF COMMUNITY-BASED CWS PROJECTS
(by C. Pendley, Kampsax-Krüger, Consulting Engineers)

In the pre-implementation phase, special effort should be made to identify and select, through community participation, the alternative which is appropriate in terms of type and technology, i.e. compatible with the available resources and which, in any case, will be perceived by the community as a definite improvement from the existing situation. Preference should be given to options implying maximum use of available local materials and equipment. The involvement of communities in every step of the process and the fact that a normal project covers the implementation of a package of many subprojects, imply a large amount of flexibility in the project cycle procedure.

The community should formally commit itself to:

- participate in the pre-implementation phases of the project cycle, i.e. express explicitly the need for an improvement of the present situation; be aware of the possible basic alternatives and the consequent burden on the community itself; agree on the type and location of the facilities;
- contribute to the implementation phase through a mixture of labour, local materials and/or cash; however minimal, this contribution is essential to engender in the community a sense of ownership;
- take direct responsibility of (or pay) for operation and maintenance of the facilities (in some cases gradually);
- make financial contributions for the replacement of equipment (this is often regarded as a longer term objective);
- timely appoint the community members who will be entrusted with operation and maintenance, so that training can be organized.

Government should be committed to:

- provide on a grant basis the investment cost for the development/improvement of facilities (in addition to contributions from the community);
- promote the favourable response of the community to the project by explaining the short term (better quality, higher reliability, easier access, etc) and long term (reduction of health hazards, etc) advantages;
- monitor the community's involvement during the project;
- explain the proper operation of the facility and the best use of the water made available, including utilizations for non-drinking purposes;
- train the appointed community members in the maintenance and repair of the facilities and in simple accounting procedures;
- set-up the necessary support structures (spare parts supplies, technical advice, quality monitoring, etc).

USE OF REVOLVING FUNDS IN THAILAND

(by Nongluk Tunyavanich, WHO/SEARO Workshop, October 1986)

Village Public Health Development Revolving Funds are handled by Revolving Funds Committees at the village level, under the supervision of the village committees with subsidies and guidance from the Department of Health and Provincial Health Offices. These Funds are initially restricted to water and sanitation. The trend is to combine different funds operating in villages into multipurpose funds which have been more successful.

Depending on the committee of a particular village, the maximum amount loaned may be the full cost of a water tank or latrine, or the fund can be divided up in order to increase the number of houses served at the same time. Considerations taken into account before the Revolving Funds Committee decides to grant a loan to the applicant are: ability to repay and willingness to comply with the revolving funds regulations. The committee ensures that the money given is used for the specified purpose and in reasonable time; social sanctions also play an important regulatory role since everybody knows each other in a village.

Repayment (with interest of 1% per month) is usually scheduled into 10 equal monthly instalments. For low income applicants the repayment may be scheduled into 20 instalments.

However many villagers are farmers and receive their main income only once or twice a year, payment is therefore required after the sale of crops. Payment is always ensured by a guarantor who is also a member of the same Fund, and who pays any sum due by a participant who is unable to meet the Fund's obligations. Village sanitary craftsmen who have received training and hold membership in the Fund advise and assist in construction.

The Thai experience so far in the use of public health development revolving funds has been characterized by absence of defaulters; the revolving fund system has really helped to promote faster installation of cement jars, rainwater tanks, latrines, and other facilities; the main problems encountered have been lack of management skills and inadequate knowledge of book-keeping. The public health development revolving fund programme is operating in 18,000 villages (out of 60,000 in the country) with a total sum of about 120 million Bahts, i.e. 4000 - 8000 Bahts per village.

The Thai experience emphasizes the importance of motivation, health education, training, back-up service by Government, performance of village-level institutions and workers, revolving funds, community participation and involvement, liaison at all levels between Government and people, self-reliance, and inter-sectoral collaboration and coordination, with technology transfers.

Currency 1 Baht - US\$ 0,04; 1 US\$ - 25 Bahts.

CWS ACCOUNTING AND COMMERCIAL PRACTICES IN MALAWI

(by D.K. Wyss, Société Générale pour l'Industrie, Consulting Engineers)

In Malawi, the District Water Supply Fund (DWSF) has little information on each one of its 50 individual schemes; the financial analysis of the Fund as a whole and of six of its components about to be extended has revealed interesting distortions of the actual operational picture as a result of specific accounting practices.

The DWSF makes use of any spare capacity to construct "minor" works consisting of system rehabilitation, small extensions and in some cases the provision of water connections. The income statements of the DWSF for 1979- 85 showed an accumulated net loss of 17.5% of total expenditure, which had to be offset by subsidies: tariffs did not seem to allow the Fund to break even. However, by capitalizing the cost of some construction works, it was shown that the DWSF had been operating on a sound financial basis during the entire period. The expenditures' side of the income statement was divided to show investment-related costs separately, which resulted in reducing by about one-third those direct operational costs (including depreciation of minor works) against which water sales and other directly operational revenue should be shown.

Similarly, the DWSF balance-sheet provided a distorted image which could be prejudicial to the Fund in its relations with future financing partners. It appeared that the valuation of fixed assets at current replacement costs had not been introduced until shortly before 1979. As fixed assets invested since that time represent only a minor part of the Fund's asset base, the DWSF balance-sheet does not reflect actual replacement needs, nor does it provide a signal when the rate of return becomes unrealistically low. It also results in a high debt/equity ratio, which provides an unfavourable picture for future borrowing. A more realistic approach consists in reevaluating the DWSF asset base as a whole. The resulting effect of increased charges can be alleviated by using a depreciation method based on arithmetically progressive allowances.

Since the future extensions will be combinations of the existing six schemes with new works, it has been found useful to break down the output of DWSF together with its production cost, into each individual system's account. This showed in particular that two of the planned schemes would operate at a loss (unless tariffs were raised) while the four others were profitable. Since water is a public service, it has been considered reasonable to cross-subsidize the loss of unprofitable schemes by applying a common national tariff to all centers. Within this national tariff, it was recommended to freeze the life-line tariff, and let large consumers cross-subsidize smaller ones. It was also noted that many households could not afford a private house connection, eventhough they could pay the subsequent charges, and it was therefore recommended to subsidize the cost of house connections for this consumers' category.

ANNEX IX/IVCOMMUNITY PARTICIPATION IN TANZANIA

(by C. Wang, Norconsult, Consulting Engineers)

Shinyanga Region, in North-central Tanzania, is severely affected by adverse drought conditions. There is a general lack of water, and mortality rates among children are high.

A socio-economic survey based on visits to ten villages selected as representative of the 67 agglomerations located in the two divisions of Negezi and Kishapu, provided the following information on the felt needs of villagers, their willingness to participate in and finance water supply improvement activities, community administration and organization, and previous village involvement and experiences in self-help projects:

- men sell water which they collect from the river and transport by back or oxcart for as much as Tsh 10 (US\$ 0.15) per bucket of 20 liters;
- in communities where improved water supplies are constructed, villagers revert to traditional water sources as soon as improved water supplies do not function, or when traditional sources are more convenient or yield better-quality water than improved sources, or when the price charged for water from improved sources is considered high;
- only in some villages are women well organized, well informed, and represented on village committees;
- there seems to be high community willingness to participate in water projects, at the initial planning and decision-making stages as well as during implementation; women especially express the desire to be more organized and to participate more actively;
- villagers are generally positive to the concept of village-level operation and maintenance, assuming that proper training can be provided;
- women generally are not involved in the collection, management and use of village funds; they usually feel outside the system and are concerned that collected monies are not being used as efficiently as they could or should be; some women express the need for better accountability of village funds;
- separate meetings with village women seem to be an excellent and desired means to discuss projects; male village leaders support such meetings, and are in fact helpful in arranging for them;
- there is a preference for "mixed" water committees including trusted men and women of the village; in some cases they are integrated with village health or welfare committees;
- there is little or no appropriate community-level training for village water committee members and technical personnel;
- according to responsible village officials, obtaining contributions for "sensible" projects, such as water, is no problem; ability to pay is taken into account when contribution levels are set; contributions are collected from all working persons between the ages of 18 and 50; a cashier trained in bookkeeping is found in every village; village funds are banked under the name of the village, with different accounts for different projects; the Village Cashier is responsible for all cash transactions related to all projects, and presents reports at monthly Village Council meetings.

Currency Tanzanian Shilling (Tsh) - US\$ 0.015; 1 US\$ = 69 Tsh.

RURAL CWS SECTOR ORGANIZATION IN TANZANIA
(by C. Wang, Norconsult, Consulting Engineers)

The concepts underlying the approach recommended in Tanzania for the Negezi and Kishapu Divisions (Shinyanga Region) rural water supply project were as follows:

- water supply facilities should be small, localised, and capable of being operated, maintained and financed at village level;
- the community should be involved in planning and design of water supplies to the maximum extent possible, i.e. community views re: siting of water points, washing slab design, etc., should be taken into account wherever possible. Further, during initial organisation and planning meetings, the community should be informed of available options, costs of different alternatives, etc., so that it is aware of advantages, disadvantages, costs and consequences associated with various possible solutions;
- the community should be organized and demonstrate its firm commitment to village ownership principles before construction materials are allocated and technical work actually commences;
- that people use traditional sources should be accepted and incorporated into project activities (e.g. providing training and limited materials to line open dug wells and install/improve lead-away drainage), rather than ignored;
- coverage should be complete in a few pilot villages, rather than scattered supplies being provided in many different villages. For example, it is better to install six handpump-equipped shallow wells and improve two dug wells in one single village, than to install ten demonstration shallow wells (or improved wells) in ten different villages. Only in this manner can real health impacts be made, measured, and ultimately, effectively demonstrated;
- that livestock watering will always be a priority, and always take place no matter what the felt need for safe drinking water, should be recognized and dealt with. Where there is potential danger of competition for, or contamination of, improved domestic water sources by animals, the means with which to construct separate livestock watering points (e.g. watering troughs, etc.) a safe distance away from the domestic source should be provided;
- health education should accompany all phases of community development and technical assistance work;
- project implementors and villager beneficiaries should be supported through the provision of appropriate, performance-oriented training (initial and refresher).

ANNEX IX/VIJOINT-VENTURE MAINTENANCE IN RURAL CWS IN LESOTHO

(by L. Krayenbühl, EPFL/IGN - 1985)

The construction of village water supplies in Lesotho is a joint venture between government and communities: villagers agree to form a Village Water Committee and to contribute free labour during construction, and cash for maintenance; government and donor agencies provide all the capital costs of construction and the technical expertise; system design is based on simplified construction techniques and quality materials to ensure long life and minimum maintenance; once constructed, the water supply belongs to the villagers who are responsible for security, operation, and maintenance; the institution responsible for assisting the community during construction, Village Water Supply (VWS), continues to support the village.

Recently a policy was designed to recover 50% of maintenance costs; identifiable direct costs are transport, cost of crew time spent in villages making repairs, spare parts, materials and supplies; a service charge is added. M. 38,000 can thus be generated annually to partially reimburse the annual maintenance outlay of VWS. The villages' share of maintenance costs will be collected, and funds for systems' maintenance will again be allocated by government to VWS.

Cooperation between government and the village has been effective during the construction phase of water supplies and can be extended to keep these facilities in good working order. By joint venture maintenance, each party agrees to undertake certain responsibilities.

The obligations of the Village Water Committee will be to organize and provide free labour as needed to assist the repair crew; to pay the cost of repair including a minimum service charge for each repair request; and to pay VWS crew labour costs for the time spent in the village repairing the breakdowns.

The obligations of government will be to allocate maintenance funds to VWS to cover the entire budgeted requirement, and to open a revenue account for VWS maintenance for the collection of payments from villagers.

The obligations of VWS will be to guarantee each new system constructed for a period of one year, repairing any breakdowns at no charge to the village; to employ technically trained personnel in sufficient numbers to adequately respond to requests for repairs; to continue to train village water minders so that dependency on outside assistance can be reduced; to maintain necessary tools and equipment to meet the maintenance needs; to maintain an inventory of spare parts and supplies to meet repair needs; to pay for the transport to and from villages of maintenance and repair crews; to cover all administrative and overhead costs associated with maintenance; and to upgrade facilities to cover major repairs costing over M. 500 and to pay the total cost of rehabilitations through capital funds provided by government with support from donor agencies.

Currency Maloti (M.) - US\$ 0.49; 1 US\$ - 2.03 M.

RURAL CWS IN KENYA, MALAWI, SRI LANKA AND TANZANIA
(by T.S. Katko, Tampere University of Technology)

On the basis of cases from Kenya, Malawi, Sri Lanka and Tanzania, a study of the major CWS development constraints and "alternatives for transferring responsibility to recipients" gave the following indications:

- defective operation and maintenance together with logistical difficulties proved to be the most severe constraints as seen by both the governments of the developing countries and by foreign experts;
- the governments regarded the lack of trained personnel as a very severe constraint; the foreign experts brought up the acute problem of cost-recovery as well as management- and effectiveness-related issues;
- lack of training as such is probably not the most severe constraint; more attention should be paid instead to the relevance of training syllabi and to the capacity of the national institutions to manage all the necessary activities;
- although the low-cost technology approach is now accepted by all parties, in practice many sophisticated schemes are still constructed;
- in spite of the lack of water resources in some areas, research efforts remain insufficient;
- the high number of agencies and projects also creates other constraints resulting from difficulties in coordination and standardization;
- the success of methods to overcome constraints is largely dependent on the efficiency of cost recovery.

Many rural schemes, upon completion of construction, fail to provide service to communities, or they become difficult to operate and maintain due to inefficiency or the lack of suitable management systems. Partly because international support was available, most developing countries have until recently concentrated on constructing new schemes. If most of the schemes constructed were maintained and kept operative, many developing countries would not have any funds for new investments.

It is likely that the governments in developing countries have avoided the gap in sector development only because most of the water schemes were not operative. Thus there is an urgent need to develop methods for cost recovery to increase local funds. Although many investments have been financed by donors, it is uncertain whether they would also be willing to pay for operation and maintenance. If they are, one could ask whether there is any sense in that kind of support in the long run, considering the ultimate self-reliance goal of developing countries. As a key policy matter it is evident that the decision by some developing countries to supply water to all people free of charge should be reconsidered and at least partial cost recovery encouraged.

ANNEX IX/VIII

POTENTIAL FOR PRIVATIZATION OF VILLAGE CWS IN LESOTHO
(by D. Warner - WASH Field Report No. 215)

1. Privatization has not been dealt with to any significant degree at the policy-making level by Government agencies. However, proposals for privatization would likely be considered without bias.
2. Earlier water projects in the rural communities encountered difficulties in sustainability due to a lack of emphasis on community responsibilities for maintenance. There are indications that communities may still be reluctant to assume maintenance responsibilities and that local capabilities for implementing cost recovery would need to be significantly upgraded to overcome these attitudes. The problem stems not so much from a lack of financial resources as from the perception that maintenance is a Government responsibility. In order to change these perceptions, village water committees would need to be strengthened and given improved levels of support from district rural development officers and their staff of rural development assistants.
3. Gravity systems are constructed whenever possible, but handpumps constitute the principal maintenance problem to be addressed initially, as there are approximately 2,000 in existence at present.
4. Costs incurred by the Village Water Supply and Sanitation (VWSS) Project in construction have averaged US\$ 38.81 per capita served for new systems of all types. Maintenance costs averaged about US\$ 1 per capita served. This however, does not represent an adequate level of maintenance, especially for handpumps. Only about 9% of the VWSS budget is allocated for maintenance at present. Maintenance funding requirements will increase significantly and are projected to reach M. 41.6 million or an average of M. 15 per household (M. 3 per capita) by 1991. Opportunities for private sector involvement seem strongest for handpump maintenance, with the VWSS retaining responsibilities for supervision, procurement, and revenue collection.
5. There is an existing cadre of firms willing and able to participate in the maintenance of rural water supply systems. Currently, private activities in this areas involve well drilling, handpump installations, plumbing and mechanical services, and irrigation systems installation. There is an apparent wide range of experience and technical expertise; all firms would have difficulty assuming all of the VWSS maintenance workload, indicating the desirability of dividing the work to be privatized into smaller components.
6. The VWSS has been advised to contract with the private sector for maintenance in the four lowland districts which have the greatest density of handpumps and to employ local technicians to serve small groups of villages in the other six districts. Privatization of handpump maintenance should be rapidly initiated in the four lowlands districts if competitive bids confirm the prospective benefits. Similar steps would be taken to implement the village level technician approach in the six highlands districts, on a phased basis. Cost recovery is recommended to begin at a relatively low level, increasing for instance over five years to about 75% of full cost. Privatization should be supported by strengthened systems of rural development at the district level and improved performance of water committees at the village level.

Currency 1 Maloti (M.) = US\$ 0.49 ; 1 US\$ = 2.03 M.

RURAL SANITATION PROJECT IN LESOTHO
(by D. Warner - WASH Field Report No. 215)

Lesotho's "Third Five-year Development Plan, 1980-81 to 1984-85" outlined the scope and objectives of a pilot project which would provide the foundation for a subsequent nationwide integrated sanitation programme. A combined health education and latrine construction programme was envisioned, to be carried out in rural areas which are already served with upgraded water supplies or where existing water supplies are adequate. One of the main features of the pilot project was the ownership and use of latrines by individual households.

A study of the financial and economic aspects of the rural sanitation sector was carried out by WASH in October 1985. The principal financial and institutional findings and conclusions are highlighted below.

Financial Aspects

1. Ability to pay.
 - (a) Approximately 50% of the households would be able to pay the full cost of acquisition of a latrine.
 - (b) Approximately 5% would defer purchasing a latrine.
 - (c) The remaining 45% would likely require some type of financing assistance.
2. A national rural sanitation project would have significant capital investments and recurrent expenditures.
 - (a) Recurrent expenses would be approximately 15% of the Ministry of Health's total recurrent budget in recent years.
 - (b) Capital expenditures would require an increase of 100% over recent capital budget levels.
 - (c) Funding requirements for the first five years of the programme (100,000 latrines) are expected to cost M. 14 million.
3. Donor assistance and cost recovery from beneficiaries would be essential parts of the financing plan. Donor support should be sought as soon as possible. Some donor interest has already been expressed in providing funding for three out of ten districts.
4. Features of a variety of financing options.
 - (a) Government subsidies.
 - (b) Provision of seed money for revolving funds to be administered by credit unions and/or interest-free advances administered at district level.
 - (c) For households demonstrating financial need (approximately 15%), incentive grant funding of 50% should be made available, tied to demonstrated ability to match funds.
 - (d) Optimal financing plans should be pilot tested in two villages and focused on lower-income households.

Institutional Aspects

1. Much of the decentralized staffing needed to carry out a nationwide rural sanitation project is already in place.
2. The principal feature of the proposed approach is that Government assumes the role of facilitator on a person-to-person basis at the village level.
3. Government plans for increasing the number of village health workers from 3,000 to 5,000 is an important prerequisite for attaining project goals.

Currency Maloti (M.) - US\$ 0.49 ; 1 US\$ - 2.03 M.

ANNEX IX/X

SANITARY VILLAGES IN ZAIRE

(USAID/DSSP/SANRU project - Summary by P. Stevens, independant consultant)

Adequate sanitation is recognized to be a determining factor in the success of the primary health care programmes of Zaire. In each organized rural health zone, the inhabitants are motivated and assisted to clean up their villages and the villages which are maintained in satisfactory sanitary condition are certified each year by the zone medical chief.

Among the 306 rural health zones, 75 zones (including about 11,000 of the 43,000 villages of the country and having a total population of about five million persons) are at present assisted by the rural Health project SANRU. At the end of the year 1985, 880 villages (8% of the villages assisted by SANRU) were certified as "sanitary" and this number was increased to 1,677 (15% of SANRU villages) at the end of 1986. This represents a very encouraging result, especially since the work was entirely done at the expense of the inhabitants themselves.

The SANRU water and sanitation coordinator, or another professional member of the health zone staff, visits each village about once a month, where he undertakes the inspection, the health and hygiene education, and the technical assistance for the construction and maintenance of simple improved water points, the construction of sanitary latrines and the hygiene of houses and of their surroundings. The water and sanitation coordinator is assisted on site by a community health agent and sometimes by the local health centre nurse.

The salary and travel costs of the coordinator are included in the budget of each rural health zone, which will eventually be totally financed by the benefitting population. Financial support by the Government and by donor agencies is however needed during the initial period of the programme.

COMMUNITY INVOLVEMENT IN SRI LANKA

(by C. Pendley, Kampsax-Kruger, Consulting Engineers)

Ukuwela Area WSS, Central Province (Sri Lanka); population served: 12,000 in 23 villages by 56 public standposts and 850 individual connections. System constructed in two years and handed over to the National Water Supply and Drainage Board.

1. Technical options, including handpumps and upgraded traditional wells, were presented to Community representatives prior to commencement of construction.
2. The numerous requests for extensions and additional standposts were responded to promptly, and alternative types or levels of service were offered wherever possible.
3. More affluent and commercial areas and other potential sources of revenue were identified during the feasibility study. Later, a door-to-door promotional campaign was conducted to encourage household, commercial and institutional connections where possible. This campaign yielded requests for 850 individual connections. The timing was planned to coincide with pipe-laying, a highly visible activity. Care was taken not to locate standposts near houses which could afford individual connections.
4. "Willingness to pay" was assessed by means of an "application" fee, which corresponds to one-day's wage for a labourer, and later an agreement to pay the cost of service connection. Confidence was built in the water authority when a "mobile-office" was established at a central location in the service area to issue and accept applications for connections.
5. Community participation during construction was organized on a "neighbourhood" basis, i.e. where people already knew each other and had a tradition for doing things together. Thus, a sense of competition was created between groups. Voluntary caretakers were selected by village representatives, again on a neighbourhood basis, and were trained on-the-spot.
6. The project was supported by supplementary inputs of household sanitation, recruitment and training of Volunteer Health Workers by the health department, and orientation meetings for school teachers, technical officers, and other key groups.
7. A mass media campaign, including newspapers and radio, was launched simultaneously with the start of the construction work, with messages designed to support participation in the Project and applications for individual connections.
8. Periodic monitoring (including financial matters) continued after the handing over of the scheme to the Water Board, with prompt response to breakdowns and complaints. It is intended to use the revenue from the scheme to subsidize the operation and maintenance costs of handpump wells for poorer communities outside the area covered by the scheme, but under the same water authority.

APPENDIX A
Draft Framework Forms

OVERVIEW OF REQUIRED INPUTS AND TIMING
DRAFT FRAMEWORKS FOR WATER SUPPLY AND HOUSEHOLD SANITATION

* * * **COMMUNITY WATER SUPPLY** * * *

Table WS.1. Overall Inputs Required for Water Supply Project.

No. Sustainability Element -- Water Supply	Development Input		Recurrent Input	
	Agency+	Comm'nty	Agency+	Comm'nty
	Col. 1	Col. 2	Col. 3	Col. 4
1 Strong Community institutions	:	:	:	:
2 Appropriate skills	:	:	:	:
3 Coverage recurrent phase inputs	:	:	:	:
4 Supportive attitudes	:	:	:	:
5 Accepted service levels	:	:	:	:
6 Appropriate technology	:	:	:	:
7 O&M support services, operation	:	:	:	:
8 Community extension services	:	:	:	:
9 Decisions on responsibility	:	:	:	:
10 Execution of responsibilities	:	:	:	:

* * * **HOUSEHOLD SANITATION** * * *

Table HSN.1. Overall Inputs Required for Household Sanitation Project.

No. Coverage Element -- Household Sanitation	Development Input		Recurrent Input	
	Ex-H.H.	H.H.	Ex-H.H.	H.H.
	Col. 1	Col. 2	Col. 3	Col. 4
1 Appropriate technology	:	:	:	:
2 Support of local leaders	:	:	:	:
3 Local awareness	:	:	:	:
4 Household priority	:	:	:	:
5 Examples of sanitation successes	:	:	:	:
6 Appropriate skills	:	:	:	:
7 Involvement of women	:	:	:	:
8 Community extension services	:	:	:	:
9 Decisions on responsibility	:	:	:	:
10 Execution of responsibilities	:	:	:	:

where:

- " - " lower end of scale -- relatively little/no input req'd.
 " *** " upper end of scale -- relatively great/important input req'd.
 " * ") value in-between.
 " ** ") - d.o. -

ASSESSMENT OF INPUTS -- WATER SUPPLY

Table WS.1.1. Community Responsibility, Development Phase, Water Supply (ref. Table WS.1, Col. 2).

No. Sustainability Element -- Water Supply	Communic. Time	Labour Time	Skills	Mat'ls/- Equip.	Cash
1 Strong Community institutions	:	:	:	:	:
2 Appropriate skills	:	:	:	:	:
3 Coverage recurrent phase inputs	:	:	:	:	:
4 Supportive attitudes	:	:	:	:	:
5 Accepted service levels	:	:	:	:	:
6 Appropriate technology	:	:	:	:	:
7 O&M support systems & services	:	:	:	:	:
8 Community extension activities	:	:	:	:	:
9 Decisions on responsibility	:	:	:	:	:
10 Execution of responsibilities	:	:	:	:	:

Table WS.1.2. Community Responsibility, Operational Phase, Water Supply (ref. Table WS.1, Col. 4).

No. Sustainability Element -- Water Supply	Communic. Time	Labour Time	Skills	Mat'ls/- Equip.	Cash
1 Strong Community institutions	:	:	:	:	:
2 Appropriate skills	:	:	:	:	:
3 Coverage recurrent phase inputs	:	:	:	:	:
4 Supportive attitudes	:	:	:	:	:
5 Accepted service levels	:	:	:	:	:
6 Appropriate technology	:	:	:	:	:
7 O&M support systems & services	:	:	:	:	:
8 Community extension activities	:	:	:	:	:
9 Decisions on responsibility	:	:	:	:	:
10 Execution of responsibilities	:	:	:	:	:

Time magnitude of "communication" time and "labor" (un-skilled) time, as per given definitions.
Labor time + communication time = all time (i.e. 100 %).

Skills importance of required skills.

Mat'ls/equip. magnitude of supplies valued at going market rates.

Cash magnitude of cash transfers at/within Community.

" - " lower end of scale -- relatively little/no input req'd.

" *** " upper end of scale -- relatively great/important input req'd.

" * ") value in-between.

" ** ") - d.o. -

ASSESSMENT OF INPUTS (Continued) -- WATER SUPPLY

Table WS.1.3. Agency+ Responsibility, Development Phase, Water Supply (ref. Table WS.1., Col. 1).

No.	Sustainability Element -- Water Supply	Communic. Time	Labour Time	Skills	Mat'ls/- Equip.	Cash
1	Strong Community institutions	:	:	:	:	:
2	Appropriate skills	:	:	:	:	:
3	Coverage recurrent phase inputs	:	:	:	:	:
4	Supportive attitudes	:	:	:	:	:
5	Accepted service levels	:	:	:	:	:
6	Appropriate technology	:	:	:	:	:
7	O&M support systems & services	:	:	:	:	:
8	Community extension activities	:	:	:	:	:
9	Decisions on responsibility	:	:	:	:	:
10	Execution of responsibilities	:	:	:	:	:

Table WS.1.4. Agency+ Responsibility, Operational Phase, Water Supply (ref. Table WS.1, Col. 3).

No.	Sustainability Element -- Water Supply	Communic. Time	Labour Time	Skills	Mat'ls/- Equip.	Cash
1	Strong Community institutions	:	:	:	:	:
2	Appropriate skills	:	:	:	:	:
3	Coverage recurrent phase inputs	:	:	:	:	:
4	Supportive attitudes	:	:	:	:	:
5	Accepted service levels	:	:	:	:	:
6	Appropriate technology	:	:	:	:	:
7	O&M support systems & services	:	:	:	:	:
8	Community extension activities	:	:	:	:	:
9	Decisions on responsibility	:	:	:	:	:
10	Execution of responsibilities	:	:	:	:	:

Time magnitude of "communication" time and "labor" (un-skilled) time, as per given definitions.
Labor time + communication time = all time (i.e. 100 %).

Skills importance of required skills.

Mat'ls/equip. magnitude of supplies valued at going market rates.

Cash magnitude of cash transfers at/within Community.

" - " lower end of scale -- relatively little/no input req'd.

" *** " upper end of scale -- relatively great/important input req'd.

" * ") value in-between.

" ** ") - d.o. -

QUANTIFICATION OF CASH & IN-KIND INPUTS -- WATER SUPPLY

Table WS.2.1. Value of Community Inputs, Development Phase, Water Supply (ref. Table WS.1.1).

No.	Sustainability Element -- Water Supply	Communic. Time	Labour Time	Skills	Mat'ls/- Equip.	Cash
1	Strong Community institutions	:	:	:	:	:
2	Appropriate skills	:	:	:	:	:
3	Coverage recurrent phase inputs	:	:	:	:	:
4	Supportive attitudes	:	:	:	:	:
5	Accepted service levels	:	:	:	:	:
6	Appropriate technology	:	:	:	:	:
7	O&M support systems & services	:	:	:	:	:
8	Community extension activities	:	:	:	:	:
9	Decisions on responsibility	:	:	:	:	:
10	Execution of responsibilities	:	:	:	:	:

Table WS.2.2. Value of Community Inputs, Operational Phase, Water Supply (ref. Table WS.1.2).

No.	Sustainability Element -- Water Supply	Communic. Time	Labour Time	Skills	Mat'ls/- Equip.	Cash
1	Strong Community institutions	:	:	:	:	:
2	Appropriate skills	:	:	:	:	:
3	Coverage recurrent phase inputs	:	:	:	:	:
4	Supportive attitudes	:	:	:	:	:
5	Accepted service levels	:	:	:	:	:
6	Appropriate technology	:	:	:	:	:
7	O&M support systems & services	:	:	:	:	:
8	Community extension activities	:	:	:	:	:
9	Decisions on responsibility	:	:	:	:	:
10	Execution of responsibilities	:	:	:	:	:

QUANTIFICATION OF CASH & IN-KIND INPUTS (Continued) -- WATER SUPPLY

Table WS.2.3. Value of Agency+ Inputs, Development Phase,
Water Supply (ref. Table WS.1.3).

No. Sustainability Element -- Water Supply	Communic. Time	Labour Time	Skills	Mat'ls/- Equip.	Cash
1 Strong Community institutions	:	:	:	:	:
2 Appropriate skills	:	:	:	:	:
3 Coverage recurrent phase inputs	:	:	:	:	:
4 Supportive attitudes	:	:	:	:	:
5 Accepted service levels	:	:	:	:	:
6 Appropriate technology	:	:	:	:	:
7 O&M support systems & services	:	:	:	:	:
8 Community extension activities	:	:	:	:	:
9 Decisions on responsibility	:	:	:	:	:
10 Execution of responsibilities	:	:	:	:	:

Table WS.2.4. Value of Agency+ Inputs, Recurrent Phase,
Water Supply (ref. Table WS.1.4)

No. Sustainability Element -- Water Supply	Communic. Time	Labour Time	Skills	Mat'ls/- Equip.	Cash
1 Strong Community institutions	:	:	:	:	:
2 Appropriate skills	:	:	:	:	:
3 Coverage recurrent phase inputs	:	:	:	:	:
4 Supportive attitudes	:	:	:	:	:
5 Accepted service levels	:	:	:	:	:
6 Appropriate technology	:	:	:	:	:
7 O&M support systems & services	:	:	:	:	:
8 Community extension activities	:	:	:	:	:
9 Decisions on responsibility	:	:	:	:	:
10 Execution of responsibilities	:	:	:	:	:

ASSESSMENT OF INPUTS -- HOUSEHOLD SANITATION

Table HSN.1.1. Household Responsibility, Development Phase,
Household Sanitation, (ref. Table HSN.1, Col. 2).

No. Coverage Element -- Household Sanitation	Communic. Time	Labour Time	Skills Equip.	Mat'ls/- Equip.	Cash
1 Appropriate technology	:	:	:	:	:
2 Support of local leaders	:	:	:	:	:
3 Local awareness	:	:	:	:	:
4 Household priority	:	:	:	:	:
5 Examples of sanitat. successes	:	:	:	:	:
6 Appropriate skills	:	:	:	:	:
7 Involvement of women	:	:	:	:	:
8 Community extension services	:	:	:	:	:
9 Decisions on responsibility	:	:	:	:	:
10 Execution of responsibilities	:	:	:	:	:

Table HSN.1.2. Household Responsibility, Operational Phase,
Household Sanitation, (ref. Table HSN.1, Col. 4).

No. Coverage Element -- Household Sanitation	Communic. Time	Labour Time	Skills Equip.	Mat'ls/- Equip.	Cash
1 Appropriate technology	:	:	:	:	:
2 Support of local leaders	:	:	:	:	:
3 Local awareness	:	:	:	:	:
4 Household priority	:	:	:	:	:
5 Examples of sanitat. successes	:	:	:	:	:
6 Appropriate skills	:	:	:	:	:
7 Involvement of women	:	:	:	:	:
8 Community extension services	:	:	:	:	:
9 Decisions on responsibility	:	:	:	:	:
10 Execution of responsibilities	:	:	:	:	:

Time magnitude of "communication" time and "labor" (unskilled) time, as per given definitions.
Labor time + communication time = all time (i.e. 100 %).

Skills importance of required skills.

Mat'ls/equip. magnitude of supplies valued at going market rates.

Cash magnitude of cash transfers at/within Community.

" - " lower end of scale -- relatively little/no input req'd.

" *** " upper end of scale -- relatively great/important input req'd.

" * ") value in-between.

" ** ") - d.o. -

ASSESSMENT OF INPUTS (Continued) -- HOUSEHOLD SANITATION

Table HSN.1.3. Ex-Household Responsibility, Development Phase, Household Sanitation, (ref. Table HSN.1, Col. 1).

No.	Coverage Element -- Household Sanitation	Communic. Time	Labour Time	Skills	Mat'ls/- Equip.	Cash
1	Appropriate technology	:	:	:	:	:
2	Support of local leaders	:	:	:	:	:
3	Local awareness	:	:	:	:	:
4	Household priority	:	:	:	:	:
5	Examples of sanitat. successes	:	:	:	:	:
6	Appropriate skills	:	:	:	:	:
7	Involvement of women	:	:	:	:	:
8	Community extension services	:	:	:	:	:
9	Decisions on responsibility	:	:	:	:	:
10	Execution of responsibilities	:	:	:	:	:

Table HSN.1.4. Ex-Household Responsibility Operational Phase, Household Sanitation, (ref. Table HSN.1, Col. 3).

No.	Coverage Element -- Household Sanitation	Communic. Time	Labour Time	Skills	Mat'ls/- Equip.	Cash
1	Appropriate technology	:	:	:	:	:
2	Support of local leaders	:	:	:	:	:
3	Local awareness	:	:	:	:	:
4	Household priority	:	:	:	:	:
5	Examples of sanitat. successes	:	:	:	:	:
6	Appropriate skills	:	:	:	:	:
7	Involvement of women	:	:	:	:	:
8	Community extension services	:	:	:	:	:
9	Decisions on responsibility	:	:	:	:	:
10	Execution of responsibilities	:	:	:	:	:

Time magnitude of "communication" time and "labor" (unskilled) time, as per given definitions.
Labor time + communication time = all time (i.e. 100 %).

Skills importance of required skills.

Mat'ls/equip. magnitude of supplies valued at going market rates.

Cash magnitude of cash transfers at/within Community.

" - " lower end of scale -- relatively little/no input req'd.

" *** " upper end of scale -- relatively great/important input req'd.

" * ") value in-between.

" ** ") - d.o. -

QUANTIFICATION OF CASH & IN-KIND INPUTS -- HOUSEHOLD SANITATION

Table HSN.2.1. Value of Household Inputs, Development Phase,
Household Sanitation (ref. Table HSN.1.1).

No.	Coverage Element -- Household Sanitation	Communic. Time	Labour Time	Skills Equip.	Mat'ls/- Equip.	Cash
1	Appropriate technology	:	:	:	:	:
2	Support of local leaders	:	:	:	:	:
3	Local awareness	:	:	:	:	:
4	Household priority	:	:	:	:	:
5	Examples of sanitat. successes	:	:	:	:	:
6	Appropriate skills	:	:	:	:	:
7	Involvement of women	:	:	:	:	:
8	Community extension services	:	:	:	:	:
9	Decisions on responsibility	:	:	:	:	:
10	Execution of responsibilities	:	:	:	:	:

Table HSN.2.2. Value of Household Inputs, Operational Phase,
Household Sanitation (ref. Table HSN.1.2).

No.	Coverage Element -- Household Sanitation	Communic. Time	Labour Time	Skills Equip.	Mat'ls/- Equip.	Cash
1	Appropriate technology	:	:	:	:	:
2	Support of local leaders	:	:	:	:	:
3	Local awareness	:	:	:	:	:
4	Household priority	:	:	:	:	:
5	Examples of sanitat. successes	:	:	:	:	:
6	Appropriate skills	:	:	:	:	:
7	Involvement of women	:	:	:	:	:
8	Community extension services	:	:	:	:	:
9	Decisions on responsibility	:	:	:	:	:
10	Execution of responsibilities	:	:	:	:	:

QUANTIFICATION OF CASH & IN-KIND INPUTS (Continued) --
HOUSEHOLD SANITATION

Table HSN.2.3. Value of Ex-Household Inputs, Development Phase,
Household Sanitation (ref. Table HSN.1.3).

No. Coverage Element -- Household Sanitation	Communic. Time	Labour Time	Skills Equip.	Mat'ls/- Equip.	Cash
1 Appropriate technology	:	:	:	:	:
2 Support of local leaders	:	:	:	:	:
3 Local awareness	:	:	:	:	:
4 Household priority	:	:	:	:	:
5 Examples of sanitat. successes	:	:	:	:	:
6 Appropriate skills	:	:	:	:	:
7 Involvement of women	:	:	:	:	:
8 Community extension services	:	:	:	:	:
9 Decisions on responsibility	:	:	:	:	:
10 Execution of responsibilities	:	:	:	:	:

Table HSN.2.4. Value of Ex-Household Inputs, Operational Phase,
Household Sanitation (ref. Table HSN.1.4).

No. Coverage Element -- Household Sanitation	Communic. Time	Labour Time	Skills Equip.	Mat'ls/- Equip.	Cash
1 Appropriate technology	:	:	:	:	:
2 Support of local leaders	:	:	:	:	:
3 Local awareness	:	:	:	:	:
4 Household priority	:	:	:	:	:
5 Examples of sanitat. successes	:	:	:	:	:
6 Appropriate skills	:	:	:	:	:
7 Involvement of women	:	:	:	:	:
8 Community extension services	:	:	:	:	:
9 Decisions on responsibility	:	:	:	:	:
10 Execution of responsibilities	:	:	:	:	:

RECONCILIATION BETWEEN THE CMWS MODEL
AND CONVENTIONAL ACCOUNTING METHODS

(Note by the Secretariat)

One of the essential characteristics of the CMWS model is that it accounts for five elements of cost: time, labour, skills, materials/equipment and money. With the possible exception of labour, none of these elements can be referred to as cost in the conventional accounting sense.

An accounting model for a CMWS which reflects all five elements of cost can be summarized as follows:

1. Cost of materials used in the supply of CWS services: this includes some components of the finished product (e.g. chlorine) as well as consumables which are lost in the treatment or delivery processes; it therefore includes any purchase of bulk quantities of for instance raw water; it does not include the cost of materials used in the construction of new works, because investment is not a cost (depreciation is a cost).
2. Cost of labour used in the supply of CWS services, with the same overall restrictions as above with regard to the incorporation of direct labour in new construction; this makes it particularly difficult to distinguish between rehabilitation and other forms of investment in fixed assets management; it is actually an important decision to present such expenditures as costs instead of capitalizing them, i.e. recognize that they have added value to the agency's assets.
3. Cost of services purchased, including those of consulting firms, rentals, transportation agencies, and all form of subcontracts subject to same reservations as above; for the many CWS agencies which are exempt from taxes, these can also be included in this category as representing minor remunerations for government services.
4. Overhead costs, generally indirect (not found in finished product, nor related to volumes sold); it is advisable to create a distinct category for commercial costs, which have a direct impact on sales.
5. Financial costs, which are related to capital formation, or in the worse cases to difficulties in liquidity management.
6. Depreciation allowances and provisions of various kinds (bad debts, expansion, commercial and financial risks). Although the difference between depreciation and provisions is important, both should be treated as costs which conventional accounting methods cannot fully reflect, so that the financial risk is always under-estimated.

APPENDIX C

MAINTENANCE-FINANCING OPTIONS IN RURAL WATER SUPPLY

<i>Questions for discussion</i>	<i>Options open to the village</i>
What costs to budget for?	Remuneration of Scheme Attendants Tools and spare parts for repairs Replacement of handpumps Extension of the system
What funds to use?	Village funds Voluntary contributions Regular user payments
What rates to set?	Flat rate — i.e. all pay the same Weighted — i.e. according to benefit
How to collect money?	Fund raising on breakdown Taking money from a village fund Reserving part of village funds to establish a separate water fund Regular collection of household contributions
When to collect?	Monthly At the beginning of the financial year After harvest
Who collects?	Village water committee Handpump user group Community leaders
How to keep the money?	Village account Water account Who signs?
How to administer the funds?	Receipts for book-keeping Financial control User feedback
Who to administer the funds?	Village water committee Village accountant
How to pay ?	Per job Per month Per year after harvest In cash/kind

Source - "Handpumps - Issues and Concepts in Rural Water Supply Programmes"
IRC/CWS, Document in preparation by Christine van Wijk-Sijbesma.