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**COST-RECOVERY OPTIONS IN RURAL WATER  
SUPPLY IN DEVELOPING COUNTRIES**

Report on the Workshop held 19 May 1987  
at Tampere University of Technology (TUT)

Edited by T. S. Katko

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Tampere University of Technology (TUT)  
Institute of Water and Environmental Engineering

COST-RECOVERY OPTIONS IN RURAL WATER SUPPLY  
IN DEVELOPING COUNTRIES

Workshop, Tuesday 19 May 1987

TABLE OF CONTENTS

	Page
List of Participants	2
Opening Speech, Prof. M. Viitasaari	3
Concluding Remarks, Mr. T. Katko	5
International Views on Cost-Recovery in Rural Water Supplies, Ms. G. Kurtén Discussion	7
Views on Cost-Recovery Possibilities in Rural Water Supply in Western Kenya, Mr. T. Vuori Discussion	15
Cost-Recovery Related to Operation and Maintenance in Rural Water Supply in Sri Lanka, Mr. K. Ratinen Discussion	19
Consumers' Contributions in Covering Costs for Rural Water Supplies in Tanzania, Dr. R. Lucas/Dr. D. Mashauri Discussion	33
Cost-Recovery Issues in Regional Water Resources Planning in Mtwara-Lindi Regions Tanzania, Mr. O. Purhonen Discussion	38
Economic Potential for Cost-Recovery and Contributions in Rural Development, Mr. S. Outinen Discussion	41
Development of Rural Water Supplies in Finland since the 1940s, Mr. P. Hämäläinen Discussion	46
On the Problem of Private, Professional and Public Concern in the Implementation of Development Programmes, Prof. O. Apunen	49

**COST-RECOVERY OPTIONS IN RURAL WATER SUPPLY IN DEVELOPING COUNTRIES**  
**Workshop 19 May 1987 at Tampere University of Technology (TUT)**

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## OPENING SPEECH

by Prof. Matti Viitasaari  
Tampere University of Technology (TUT)

This workshop belongs to a series of seminars held at TUT on water supply and sanitation in developing countries during the last few years. The key issue of this workshop "cost-recovery" has risen from the on-going study at TUT on organizational alternatives and responsibility transfer of externally supported water supply projects. The workshop is also a part of the programme of the 5th Post-graduate Course in Water Supply and Sanitation held at the Institute from 1986 to 1988.

In 1971 the former Principal Secretary of Agriculture, Tanzania Mr. Forbes evaluated the project identification report of the Mtwara region water resources development in Tanzania. This project is one of the longest bilateral projects supported by the Finnish International Development Agency (FINNIDA). Forbes stated: "The principles laid down in this section are admirable but an important aspect has been neglected, namely the payment of water."

However, the payment could not be considered because it would have been against the Government policy of that time, viz. to provide water for all free of charge. At present the policy is under reconsideration.

Another example of the early criticism against free water was the workshop held at the University of Dar es Salaam in 1969. Mr. Cunningham (1969) said that the method of providing water supplies by the government free of charge does not have much connection with the villagization (Ujamaa) or self-help. By providing water free of charge the first excellent opportunity to mobilise and teach people about self-help and cooperation was lost.

Thus the discussion on the cost-recovery issue existed already in the 1960s. The same problem of payment and cost-recovery is still very acute. At present about 80 to 90 per cent of the investments of the large scale rural water supply projects are financed by foreign aid. However, these funds are generally not available for recurrent expenses. One key question could be whether such high portion of funds should be allocated to new investments without considering the running costs.

Finally I want to welcome you all to the workshop and wish you an interesting day with lively and fruitful discussions.

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## CONCLUDING REMARKS

By  
Mr. Tapio Katko, Researcher, TUT (Editor)

The need for pricing water and at least a partial covering of costs is now largely accepted.

The external support for the rural water supply sector will be limited and it will concentrate on investments. Thus the national and local funding has to be increased if the schemes are to be operational. Since the national and local funding will also be limited it will be absolutely necessary to collect fees or payments from consumers. At the first stage partial cost-recovery, for instance, the share of operation and maintenance should be achieved. However, full cost-recovery including investments as well as operation and maintenance should be the ultimate goal.

### Experiences from Individual Countries

In western Kenya the experiences show that community participation or involvement approach helps the introduction of maintenance fees. Private repairmen and water committees have proved to be appropriate tools in organizing operation and maintenance at community level.

In Sri Lanka the National Water Supply and Drainage Board is in charge of operation and maintenance of numerous water supply schemes. It is now clear that ways for collecting funds from the users must be developed. Water from standposts of piped schemes is generally free. Consumers think that hand-pump wells give lower service than standposts. Thus it will be difficult to introduce payments for hand-pump wells. The Government should urgently decide on how to recover the operation and maintenance costs of rural water supplies so that the policy would be fair to the consumers.

In Tanzania rural water supply has been declared a free basic social service. Although this policy as such has not been abandoned, the general interpretation is that operation and maintenance fees are possible. It is obvious that with the free water policy, the Ujamaa-villagization lost the first practical opportunity to test self-sufficiency. The external assistance to the sector has been channelled to implementation and much less if at all to operation and maintenance. The district councils under the Ministry of Local Government have in principle the authority to collect funds. The participants' general view was that it could be better to organize the payment at village level to ascertain that the funds will remain in the water sector.



As an example from the developed countries, experiences from Finland during the last four decades were reported. At the moment about 80 % of rural households have piped water. Piped water supply connected to single houses is the most common system. After that comes the old-fashioned bucket and well system. Large areal piped schemes form the third, and the smallest group. In spite of the fast economic development and growing urbanization since the 1940s the country will not meet the target of safe water for all during the present Water Decade.

### General Views and Hypotheses

The following views and hypotheses can be presented

1. If cost-recovery is not introduced in one form or another, the low level of operation will continue. Thus the need for cost-recovery is clear.
2. Before introducing payments for rural areas tariff structures should be reconsidered in urban areas. Quite often the urban tariffs are lower than what consumers must pay in rural areas.
3. Affordability to pay for drinking water is often quite evident. Ways of estimating actual affordability should be developed in order to decide on affordable fees.
4. Examples indicate that in spite of the obvious affordability consumers may lack the willingness to pay. A "felt need" must be created in the consumers and it can be developed e.g. by promotion activities, community involvement and water committees.
5. Direct payment is probably more appropriate than taxation and more fair to the consumers.
6. Introducing water pricing to all consumers is a basic requirement. This can promote individual responsibility building and thus avoid wastage of water.

## INTERNATIONAL VIEWS ON COST-RECOVERY IN RURAL WATER SUPPLIES

By  
Ms. Gunilla Kurtén, Councillor, FINNIDA

### Need for Cost-Recovery

The International Drinking Water Supply and Sanitation Decade was proclaimed at a Special Session of the United Nations General Assembly in November 1980. The goals of the Decade are that everyone in the world should by 1990 have access to a safe supply of drinking water and adequate means of sanitation. At the time of the proclamation of the Decade it was estimated that about 2 000 million people, half of the world's population, were without reasonable access to safe and adequate water supply. The developing countries were most severely affected and particularly the rural areas.

The financial resources needed to achieve the goals of the Decade were estimated to be between USD 40 and USD 80 billion per year depending on the type and levels of coverage and on the choice of technologies.

At the mid-term review in 1985 of the progress achieved in the implementation of the Decade, and the prospects for the second half, it was concluded that although some progress has been made, significant progress by 1990 will require a much greater sense of urgency and priority on the part of the Governments and continued support of the international community. External support needs to be increased, but the heavy dependence of many developing countries on external financing is a disturbing fact, and no matter how rapid the growth in external financing may be in the near future, it will remain vastly insufficient unless it is matched by much larger increases in national investments. On a global basis it seems highly unlikely that the prevailing patterns of funding would produce long-term sustainable development.

While it is therefore suggested that financial and technical support for water resources development and utilization from the international community must continue to increase, at the same time, there is a need for international organizations to increase their efforts aimed at strengthening the recipient countries' capacity to generate larger amounts of national and local financial resources, and to use more efficiently those that are already available.

The availability of well formulated and soundly designed projects, with clearly stated objectives and well defined costs and benefits, remains a critical element in securing

both internal and external financial resources. Unless water resources projects are demonstrably capable of generating socio-economic benefits commensurate with those being generated by other sectors of the economy, they will not be able to command the necessary financial resources. In order to formulate effective projects it is necessary to undertake a process that takes into account the relevant socio-economic objectives and policies.

As in other cases, water resources development need not, and often does not, depend exclusively on general development financing. Policies aimed at securing direct payments from beneficiaries can be instrumental in securing predictable sources of financing commensurate with the demand for them, provided they are compatible with the socio-economic objectives of the country. The concept of direct payments by beneficiaries is in fact gaining increasing support for different water resources uses.

### Urban and Semi-urban Areas

The use of water tariffs is most prevalent in the case of urban water supply systems, to the point where urban utility organizations are often in a position to seek partial, if not full, recovery of fixed and operating costs. It is not surprising, therefore that urban water supply utilities are often able to generate a large proportion of internal and external financing. Consequently, the objectives of the International Drinking Water Supply and Sanitation Decade are more likely to be reached in this sector than in others.

The provision of services to the population in peri-urban areas, which represents a growing problem in several countries of the world, often requires costly expansions of existing systems. Although the inhabitants of these areas constitute the poorer strata of the urban population, the available evidence suggests that there is nevertheless, a potential for some kind of payment for water supply services. In fact, in many cases services provided by properly organized and managed utilities could require lower payments than those being extracted from other sources. To the extent that services are provided by the same utility companies which supply the rest of the urban population, the rates charged to the inhabitants of the poorer areas could be integrated into an overall rate system.

### Rural Areas

The question of generating financial resources for water supply and sanitation in the rural areas of the developing countries is a much more difficult one. In these areas water has always been and still is usually regarded as a free good. This attitude must, however, now be changed. Even in cases where for cultural reasons the resource itself has to be considered as "free", the costs of deve-

lopment, treatment, delivery and management should be charged for and should be an integral part of the calculations for project financing.

What is needed is a different approach to the development of rural water supplies through community participation, and this leads us back to the question of socio-economic benefits mentioned earlier. The communities should, to begin with, be made aware of the socio-economic benefits derived from improved water supplies in the form of reduced occurrence of water related diseases, which in turn means less time spent on recovering from diseases, on visits to health centres and hospitals, and also means lives saved. Even if health services are free or cost very little to the user, time is money even in the rural areas, and a healthier person is certainly also more productive. An even more important socio-economic benefit derived from improved water supplies, as perceived by the rural communities, is the increased convenience in getting the water from a pump or a tap, and particularly the time saved when the water is brought closer to the household. As we all know, there are rural communities in Africa where at present the people, mainly the women and children, have to walk up to ten hours to get to the nearest water source.

If the water from the improved water supply is abundant and not only sufficient for human consumption, the socio-economic benefits increase because then the water can be used also for watering cattle and other domestic animals, and for watering and/or irrigating small vegetable gardens for example. When such benefits can be promised, it is of course easier to convince the community of the importance of improving the water supply and creating a "felt need" for it. Creating this need should be the first step in the process of community participation.

To keep up the interest, to create a sense of ownership, and also to make use of the experiences and knowledge available within the community and to transfer know-how not yet there, the community should be allowed and requested to participate in the planning, design and implementation of the improved water supply. At the same time they should be informed of their future responsibilities regarding implementation, operation and maintenance, and the financing of these. Particular care should be taken to explain to the local users the underlying reasons for reasonable financial contribution.

If there are alternative solutions available as regards type and level of coverage and choice of technology, these should also be discussed with the community, and the implications as regards the technical skills and financial resources needed for the implementation, operation and maintenance of the different alternatives should be made quite clear. However, it seems to be more and more com-

monly agreed that for the majority of the rural communities in developing countries handpump wells are the most appropriate solution from both the technical and financial point of view at this stage of development.

The communities will need help from the authorities in organizing themselves into well committees, user associations or village action committees, in designing their cost recovery system and managing it, and in establishing operation and maintenance procedures. If the communities themselves are to carry out maintenance and repairs, they have to be trained for it, if they are to use technical expertise outside the community, the authorities must make sure that these are available.

The authorities are also responsible for the procurement and distribution of spareparts for the improved water supply, unless these are produced in the country in question and readily available to all communities. The establishment of adequate operation and maintenance systems is of utmost importance because it is quite natural that the users are reluctant to pay, there is not sufficient money for operation and maintenance, as a consequence the water supply facilities will deteriorate even further and give even less service, and the users will be even more reluctant to pay and so on.

To the extent that cost recovery policies are compatible with Governments' socio-economic objectives, and with the capability of rural populations to pay for improved services, Governments should actively pursue the formulation and implementation of such policies, coupled with the establishment of strong managerial structures at the level of rural communities.

It is doubtful that full cost recovery policies could be envisaged as an immediate goal in the rural areas, but partial recovery of the capital costs through the provision of labour and locally available materials, and full recovery of operation and maintenance costs should be possible to achieve even now. Full cost recovery should, however, be the ultimate goal. If only operation and maintenance costs are fully recovered it will soon lead to a situation where the communities, given the choice of the type and level of coverage and the technology of their water supply, will choose the alternative that requires the lowest operation and maintenance costs, and this alternative might well require the higher capital costs to be paid by the Government.

While rural areas may be in no position at present to be financially self-sufficient, there is often a greater potential for the generation of funding and for cost recovery than has been generally assumed, and there is growing evidence of the willingness and ability of rural populations to pay some form of fees for the provision of improved services. The key lies in community participation, as has been stated earlier.

It must be stressed again and again, however, that meaningful community participation is more than the supply of free labour and local materials or cash contributions. Community participation implies the involvement of the entire community at all stages of project development: from the initial concepts and planning, through the construction, operation and maintenance phases. Particular attention needs to be given to ensuring that projects benefit the poorer groups, which often are not adequately reached by services in the sector.

Only recently the importance of women's involvement, as part of community participation in order to achieve project objectives, has become recognised. Women as main traditional users and interest group can contribute meaningfully to local planning, maintenance and management, which affect effectiveness of operation and use of the facilities. Women also play a major role in improving health, deciding on the use of time saved, as well as in the utilization of water and processed waste for domestic and economic purposes. Their role should therefore not be limited to that of passive project beneficiaries or of a target group for health education, but efforts should be made to involve them more actively, especially in local planning and decision-making and in management.

There is no blueprint for involving the community in the planning and decision-making processes, but it is essential to build on the existing structures of organizations in the communities and to avoid creating new ones. Plans and procedures for operation and maintenance of small community water supply and sanitation facilities should be adapted to local skills and resources. This has implications for the selection of technology. If operation and maintenance of high-level technology cannot be guaranteed, a lower service level is the only answer. A common approach to community participation has so far not been established, but a compendium, based on case studies, on ways to achieve effective community participation, including the involvement of women, is being prepared by the International Reference Centre (IRC) for Community Water Supply and Sanitation in the Hague, for the Development Assistance Committee (DAC) of the Organization for Economic Co-operation and Development (OECD).

At the same time the World Bank in Washington is preparing "A Review of Experience" of cost recovery for water supply for DAC. The draft report includes many of the same views that have already been presented here and that have mainly been taken from United Nations documents, but I would like to present also some points from the World Bank report to show how similar their views are. The report begins by stating that encouraging progress has been achieved in the first half of the Decade, but that if the pace is to be accelerated the users of water must bear a larger share of the costs. It goes on to say that increased user participation not only helps cover costs but also tends to

lead to better maintained, better managed systems, more in accord with users' preferences.

The evidence of the 19 cases of rural water supplies studied by the Bank suggests that rural communities do have the capacity and willingness to pay for water supply improvements, at least enough to cover a portion of the costs, and it also suggests that when the right approach is used, cost recovery is achievable because the users' sense of ownership, pride and responsibility is strong. Community participation is not easy to sustain, however. Initial interest and motivation may wane, seasonal employment may interrupt continuous involvement in the project. The problems of shortlived assets and community apathy could be reduced and partial cost recovery could occur under the following conditions, as shown by the experiences of the case studies:

(i) users are involved in choosing technologies, to the extent feasible, and are aware of the costs;

(ii) projects are designed to require minimal governmental support and recurrent inputs;

(iii) the least costly maintenance systems is utilized; village knowledge, skills and experience are maximized for operation and maintenance;

(iv) water supply financing and cost recovery arrangements are integrated into existing rural development financing mechanisms;

(v) water projects are integrated with broader rural development projects so that the benefits of clean, potable water can be reinforced.

While carrying out the study, however, the World Bank found that the available evidence on cost recovery in the water sector is far less complete and less substantiated than was generally believed. Therefore the Bank has already started a more in-depth research effort, involving new primary data collection through field investigations. The results of this research will begin becoming available during 1988, and then we will know much more about how cost recovery can be achieved not only on paper but also in reality.

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## DISCUSSION

**Mr. Purhonen** asked how the international views reflect the policy of FINNIDA and how the cost-recovery issues are taken into account. **The reporter** answered that FINNIDA has no written policy paper on the matter but in principle it supports the ideas of the OECD Development Action Committee. However, in rural areas FINNIDA is not yet ready to follow the World Bank recommendation on full cost-recovery. Rather we should start with partial cost-recovery. The cost-recovery is to be seen in a wide context including monetary contributions and community participation. FINNIDA is driving to introduce the cost-recovery concept to all her projects.

**Prof. Viitasaari** noted that if we proceed slowly with the cost-recovery issue it may take a lot of time. Meanwhile old water supplies break down more frequently than new schemes can be constructed. Viitasaari wondered whether it would be better to concentrate activities more on institution building of local government as the Swedish International Development Authority (SIDA) is doing in Tanzania. **The reporter** replied that FINNIDA is putting more and more emphasis on institution building.

To the question on standard approach raised by **Dr. Lucas** **the reporter** replied that approaches must be adjusted to local conditions. Consumer participation in the projects depends on many factors, for example, on the availability of water sources. In Tanzania the users have not been



given a chance to choose the technology. Thus hand-pump wells are constructed in all the suitable areas. Consumers can participate in well siting and well construction to create the ownership. Nowadays they have to deposit a sum of money before the construction will be started. If the community provides labour for construction the money can be used for buying the required maintenance tools. If not the money can be used for paying for the labour. Additionally village well caretaker is trained to carry out operation and maintenance assisted by the project.

**Mr. Mayo** pointed out that the major factor in the issue of cost-recovery is the policy of the country. **The reporter** agreed that unless the government policy allows it will be very difficult to arrange any type of cost-recovery. The policy of "free water" has been decided in a number of countries. The international organizations are now trying to convince the governments in the developing world to change their policies. Thereafter, appropriate cost-recovery systems should be developed for each country.

## VIEWS ON COST-RECOVERY POSSIBILITIES IN RURAL WATER SUPPLY IN WESTERN KENYA

by  
Mr. Timo Vuori, Oy Vesi-Hydro Ab, Consulting Engineers

### General

Rural Water Supply Development Project in Western Province of Kenya is part of the development cooperation between the Governments of Kenya and Finland. The agreement on technical cooperation dates back to 1975. The first agreement on the Project, the one for the Planning and Investigation Phase, was signed in 1981.

The project area, 3600 square kilometers, covers about 40 % of Western Province and 5 % of Nyanza Province. The present project population, about 0.9 million, is projected to grow 3-4 % annually reaching about 1.7 million by 2005. The project area is quite rural, all the bigger centres, the towns of Kakamega, Busia, Bungoma, and Webuye, are situated adjacent to it. The average population density in the project area reaches 240 persons per square kilometer.

In the Planning and Investigation Phase of the Project (1981-1983) the ground water and surface water resources of the area were studied, altogether about 150 test handpump wells constructed, and the water supply development plan up to the year 2005 was elaborated.

In the First Implementation Phase, 1984-1985, the number of new water points reached 740 (180 spring protections, 560 handpump wells). The Second Implementation Phase (1986-1988) has so far, March 1987, increased the number of water points by 555, the total figure being about 1400 springs of handpump wells. On average, about 200 people utilize each well, accordingly the total population served is approaching 300 000 people.

A lot of effort has been placed on involving the beneficiaries in the Project ever since the implementation started in 1984. At the moment almost all the wells have committees to look after the facility, and to collect funds for repairs.

### Cost Recovery So Far

1. Pumps in the project area are being repaired by either the Project's mobile maintenance teams (equipped with Land Rovers) or by repairmen, trained by the Project, living in the villages and moving to repair sites by their own means, generally with a bicycle. The repairmen represent the decentralized maintenance model, and the mobile groups the centralized one.

2. All repair operations are charged from the well committees at the recommended prices of which all the well committees have been informed. A special information leaflet indicates the prices of different spare parts, labour and transportation. The prices have been calculated by the Project, based on the costs caused by the decentralized maintenance model, that of private repairmen. Comparisons have shown that the costs of mobile maintenance units are too high and affordable repairs are possible by the private repairmen working and living in their own service areas.
3. The Project is continuously training more private repairmen and, eventually, the need of mobile maintenance units should almost disappear.
4. Cost recovery has been higher than expected so far. After two years of operation, at the end of 1985, the well committees had paid about 80 % of the repair-bills. People seemed more willing to pay in the dry areas where water is normally pumped from deep (up to 50 m) borehole wells, whereas in more wet places people tended to pay more slowly. One year later, this pattern had changed and the willingness seemed fairly well distributed over the project area. The figure of 80 % has remained.
5. Conclusions and Notes
  - In the areas where the community was not involved before the wells were constructed people have paid quite reluctantly. Intensified community work has in most cases helped.
  - There seem to be different ways in which the committees collect the money: Cash, selling of e.g. vegetables grown at the well site, through school fees etc.
  - In several cases the well committees have opened bank accounts to keep the money. However, the lack of banking facilities make money keeping difficult and this hinders prompt payment of bills.
  - Priorities and resources in the Project have to be set to facilitate good co-operation with the authorities and the people. In the western Kenyan Project more permanent personnel are working in community development section than any other section of the Project.
  - Handpump development can still render more feasible projects in the future. Easier maintenance, fewer necessary tools, lighter structures mean better chances for private repairmen and committees to carry out successful repairs. Investment from donors to handpump development can yield quite good results together with intensified community involvement.

- As far as pumped piped schemes are concerned, the large systems seem to be difficult to manage while small systems face high labour costs making the economical basis of the schemes too weak. Solar energy seems to provide considerable benefits compared to diesel-power in rural areas. The operational personnel can be greatly reduced while the supply of cheap energy is abundant. Only the high investment cost and the small size of present equipment can slow down greater utilization of solar power.

## DISCUSSION

Mr. Titus asked how the success of collecting funds at the level of 80 per cent is calculated. The reporter replied that the payments are based on invoices made by the project at a certain time. All the payments during the following three months have been included when calculating the rate of payment success. In the beginning all the funds were collected by the project. There are already water committees who run their own accounts. Sometimes difficulties with payments have arisen. In such cases the well committee is contacted and usually the problems can be solved. The most difficult cases occur with easily available traditional surface water sources. For less than ten out of 800 wells in the project area payment has been a continuous problem. This share is very low just as the violence or vandalism against the wells.

Dr. Odira wondered whether the problems faced with payments on hand-pump wells were connected with the consumers' previous emotional experiences caused by the few piped schemes or whether the problems were based on management, the ways of conducting the payments. The reporter answered that the community participation approach is not only the problem of the donors but also the problem of the government. With the schemes implemented by the Ministry of Water Development communities have been involved much less than hoped. A lot of improvement is needed in this field. The project introduced the community approach to the rehabilitation of a few existing piped schemes. Among others the Butula scheme has been operating quite well.

Mr. Markkanen asked how the payment for the private pump mechanics (eight so far) is channelled. The reporter clarified that these funds go directly from the community to the mechanic. These mechanics have made observations quite actively on the schemes. A small extra payment is given for these check-ups.

Mr. Hämäläinen wondered if any revenues e.g. water fees have been considered in covering the costs. The reporter

said that measuring of water consumption from a community well would be very difficult. At the moment the governments should strive to make people pay for the major part of the costs. The new generation hand-pumps like the NIRA AF-85 are much cheaper to maintain than the older models. But how should the older versions be replaced?

Mr. Mayo asked if the 80 per cent level of payment will be possible in the future including the replacement of pumps. The reporter's view was that hard work will be needed to keep up this satisfactory level. If hand-pumps are properly maintained they will last long. If maintenance is forgotten in the beginning, the hand-pumps will deteriorate very fast.

Prof. Viitasaari wanted to know whether the payments are to cover the costs of special items or whether they are just lump-sums. The reporter replied that the project has detailed specifications for each type of repair including the sparepart costs and the labour needed.

## **COST-RECOVERY RELATED TO OPERATION AND MAINTENANCE IN RURAL WATER SUPPLY IN SRI LANKA**

by  
Mr. Kari Ratinen, Lahti City Water Supply and Sewage Works

### Background

The Government of Sri Lanka has recognized for decades the important role water supply and sanitation play in the health and prosperity of its people. The National Water Supply and Drainage Board was established in 1974 as an agency dedicated to the construction and operation of water supply and sanitation facilities. The Sri Lanka Water Decade Plan was adopted in 1980 committing the facilities. The Sri Lanka Water Decade Plan was adopted in 1980 committing the nation's resources to provide 100 percent urban water supply coverage by 1990 and 100 percent rural water supply coverage by 1995. The estimated and projected levels of service for the rural, urban and estate population are shown in the following table:

	percentage of population served				
	estimated			projected	
	1981	1983	1986	1990	1995
urban	47	69	75	100	100
rural	18	27	35	50	100
estate	59	65	75	100	100

The capital investment required to provide the decade coverage planned by 1995 has been estimated to be approximately Rs 10 000 million of which amount about Rs. 6 000 million are for rural water supply (6 Rs corresponds to 1 FIM).

### Existing Agencies Responsible for O & M and Their Capacity to Perform it

#### **National Water Supply and Drainage Board**

The NWS & DB is the main organization responsible for the operation and maintenance of piped water supply schemes. Over recent years NWS & DB has emphasized the design and construction of new water supply schemes and as the main implementing agency for the Decade Plan they have made remarkable progress in construction of schemes. In addition, because of managerial and fiscal weakness of local authorities, the GSL has transferred operational and maintenance responsibility for a large number of schemes to the NWS & DB. The number of these schemes has risen rapidly from about 100 (year 1980) to 250 (year 1986).

These schemes serve about 80 % of the population served by piped schemes.

The O & M capacity of the NWS & DB has not paralleled the growth in physical facilities. Operationally, NWS & DB is divided into eight regions with the NWS & DB headquarters at Ratmalana, near Colombo. Historically, the regional offices administrated by Regional Managers, had only minimal capacity for operation and maintenance since almost all functional support and decision-making was centralized at the headquarters. However, in line with GSL sector objectives, NWS & DB is devolving more autonomy on the regions which are being strengthened administratively and supported by "The Water Supply and Sanitation Sector Project" funded by USAID. The achievement of effective O & M programmes for water supply schemes operated by the NWS & DB is one of the major components of the Project.

The Project will improve the whole NWS & DB's O & M organization by giving technical assistance, training, commodities and improved facilities not only for the headquarters at Ratmalana but also in the Regions. The central theme of the NWS & DB institution building programme is the decentralization of operations. This will include the establishment of three Regional Support Centres at Kandy, Anuradhanura and Matara and the strengthening of existing regional facilities at Rathapura and Kurunegala (under Colombo), at Amparai and Bandarawela (under Kandy RSC) and Jaffna (under Anuradhapura RSC). The improvement at the NWS & DB's headquarters (central facilities) will comprise rehabilitation of all the existing facilities. The Regional Support Centres will be provided with following operation and maintenance facilities: offices, workshops, stores, water laboratory, training center and fuel depot with all the necessary equipment and tools. The Regional Offices will be provided with the same facilities but the training centre and also the facilities are smaller and more modest than those at the Regional Support Centres. At the moment the Project is still under implementation and will be completed at the earliest in 1989 as originally scheduled.

The Project has commenced a pilot O & M project at Matara. The construction and equipping of Kandy Regional Support Centre is due to start during the year 1987. The Project has already had some favourable effects on the attitudes in regard to O & M but since the facilities are still missing there have not yet been any remarkable changes in the operation and maintenance activities of the rural water schemes. The adequate operation and maintenance constraints are still there. The most obvious of these is the insufficiency in funds allocated to operation and maintenance in the budget. This inadequate attention is paid to preventive maintenance. In addition lack of training, maintenance procedures, transport, spare parts etc. are often mentioned as hindrances of adequate

operation and maintenance. The new organization chart of the NWS & DB is given in Annex 1 and the map showing the location of the NWS & DB's Regional Support Centres and Regional Offices is given in Annex 1.

### District Development Councils (DDC)

In general DDCs are responsible for the operation and maintenance of the water supply schemes in their administrative areas. However, because many DDCs lack the financial resources, managerial expertise and logistical support required, NWS & DB has been assuming the responsibility for an increasing number of water supply systems. Local authorities are responsible for operation and maintenance of 147 piped schemes (1986) serving only about 20 % of the population served by piped schemes. Most of these schemes are under the municipal and urban councils and only some small schemes are under the DDCs.

According to the agreed strategy of the MLGHC the maintenance of the hand-pump wells is the direct responsibility of the DDCs or other local authorities concerned while the NWS & DB will provide technical assistance and advice to the local authorities. The circular (My no LG/WS/92) by the Ministry of Local Government, Housing and Construction concerning the maintenance of community wells gives detailed information of the maintenance functions of the wells at different levels.

- A) A voluntary well caretaker will be responsible for the daily maintenance, security and cleanness of the surrounding area.
- B) The Community Centre or other Voluntary Organization will have overall responsibility for the management of the well, through a caretaker nominated by it.
- C) A pump mechanic, paid employee of the DDC, will cover about 150 wells and takes care of pump repairs and water sampling for quality testing. The pump mechanic will be supervised by the Technical Officer working in the DDC sub-office.
- D) Technical Officers will carry out sanitary surveys where required in consultation with the MOH. They will also have a close liaison with the NWS & DB.
- E) NWS & DB will provide assistance for major repairs of pumps, water quality control and training.
- F) The DDC will be responsible for the management of the staff, the necessary institutional set-up, arrangements for any water rates or levies, payment of services and supplies and general co-ordination of all well maintenance work in the district.



The operation and maintenance organization for hand pump wells and gravity schemes is given in Annex 3.

Although the above mentioned maintenance procedure for hand-pump wells is an agreed strategy of MLGHC, the DDCs have often refused to take over the hand-pump wells constructed by various agencies. DDCs are complaining about their poor technical and financial capability to do the maintenance of the community wells.

During the years 1980-86 about 10 000 community wells have been constructed in Sri Lanka but still the responsibility for the maintenance of the wells has not completely been agreed upon.

### Tariff Policy and Present Water Tariffs

NWS & DB's tariff policy reflects both the financial needs of the agency and historic social/cultural norms. For centuries water has been free to all citizens in Sri Lanka. In the past few years water has been a free commodity provided by the central government. As the costs of providing water have risen and the total burden of the NWS & DB budget exceeds the collected revenues, greater pressure has risen for the water sector to defray an increasing share of its expenses through user fees. The current tariff structure reflects these basic policies. First, the structure provides for a substantial crosssubsidy in the urban sector, the large commercial users (commercial, industrial, hotel and shipping) pay significantly higher rates than domestic consumers. Secondly, a significant number of domestic consumers (30 percent) are provided a lifeline service, i.e. free water. Thirdly, revenues from piped systems are assumed to defray the costs of operations, depreciation and debt service for not only piped systems but also sanitation and non-piped systems.

According to the Gazette No 285/28, 24th February, 1984 the present water tariffs are as follows:

<u>Domestic Consumers</u>	<u>Rs/cu.m</u>
First 10 cu.m/month	free
Second 10 cu.m/month	1
Next 10 cu.m/month	3
Thereafter	5,50
Standpost supply	0,80

Private Commercial Enterprises

Water based industrial enterprises	9
Tourist hotels	15
Enterprises which undertake the sale of potable water to ships	15
Other commercial enterprises	5,50

Non-profit Organizations

Religious Institutions including charitable organizations approved by the Government	same as those applicable to domestic consumers but with a rebate of 90 %
Government Institutions	5,50

Operation and Maintenance Costs in Relation to Revenues

NWS & DB's operation and maintenance costs and revenues are given in Annex 4. The table shows that the calculated revenues will cover the operating expenses but because of the high percentage of bad debt, the net income does not cover the operating costs. In the year 1985 bad debt for the greater Colombo area was approximately 30-40 percent of the accounts. Altogether 80 percent of the customers were billed. At the same time bad debt in the urban areas outside the Colombo area was estimated to be 80-85 percent with the largest arrears those attributable to the bulk consumers (local communities and government institutions) and a few large commercial users. NWS & DB has initiated in 1985 a special program to reduce bad debt and enhance current revenues. Figure 1 shows the NWS & DB's operation and maintenance costs and revenues in 1985-1995.

With the assistance of USAID, special efforts are under way to focus collection activities on large consumers, place emphasis on current arrears and prompt payment rather than debts incurrent several months or years ago, and to provide the logistical support needed by NWS & DB staff to install, maintain and read meters. Improved information systems are also being initiated to identify large arrears at an early date. In 1980, NWS & DB's cash collection covered only about 2 % of its total expenditures and about 10 % of its operating costs. By the end of 1986, these percentages increased dramatically to about 30 % and 90 % respectively. The projected operating budget summarized in Annex 4 suggests that anticipated revenues will begin to cover NWS & DB's operating expenditures within 2-3 years.

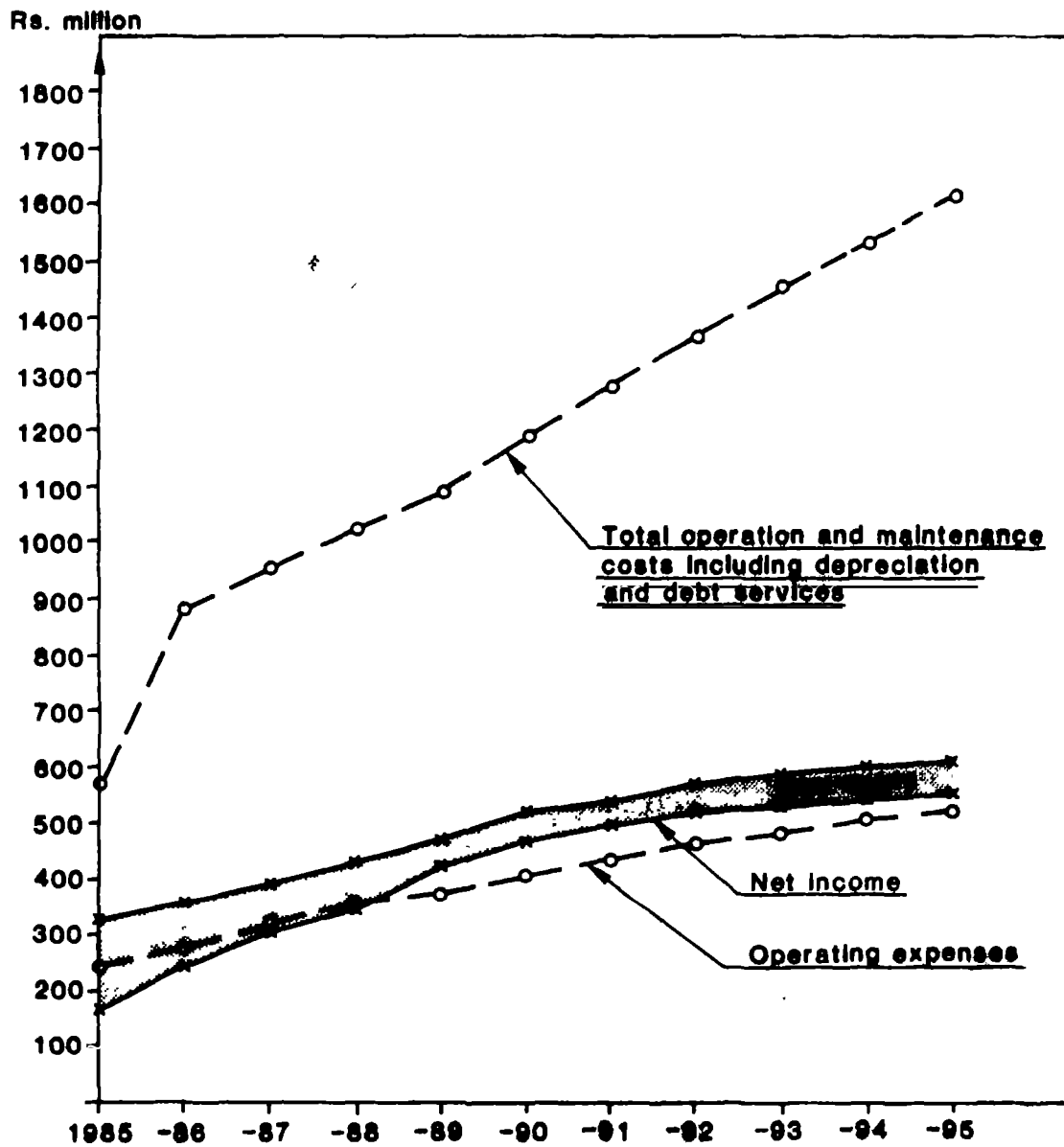


Figure 1. NWS & DB's Operation and Maintenance Costs and Revenues in 1985-1995.

It has been calculated that in Harispattuwa area where FINNIDA has funded 11 pumped piped systems serving about 65 000 people the operation and maintenance costs are about 2,60 Rs/cu.m. The costs include salaries, energy, chemicals, transport, tools and spareparts. It has also been calculated that the revenues in Harispattuwa will be only 1,83 Rs/cu.m. This is assuming that consumers with house connection would pay the present tariff and that the DDC would meet the cost of water provided to the standposts. The deficits to NWS & DB will be 0,77 Rs/cu.m which is about 30 % of the O & M costs. So it is most likely that the present tariffs are insufficient to cover the operation and maintenance costs of pumped piped systems in rural areas where the population density is only about 1500 per square km. Therefore it has been recommended that pumped piped schemes should be constructed for areas with a population density of at least 2000 per square km and for communities with a high proportion of commercial properties in order to get enough revenues to cover the operation and maintenance costs.

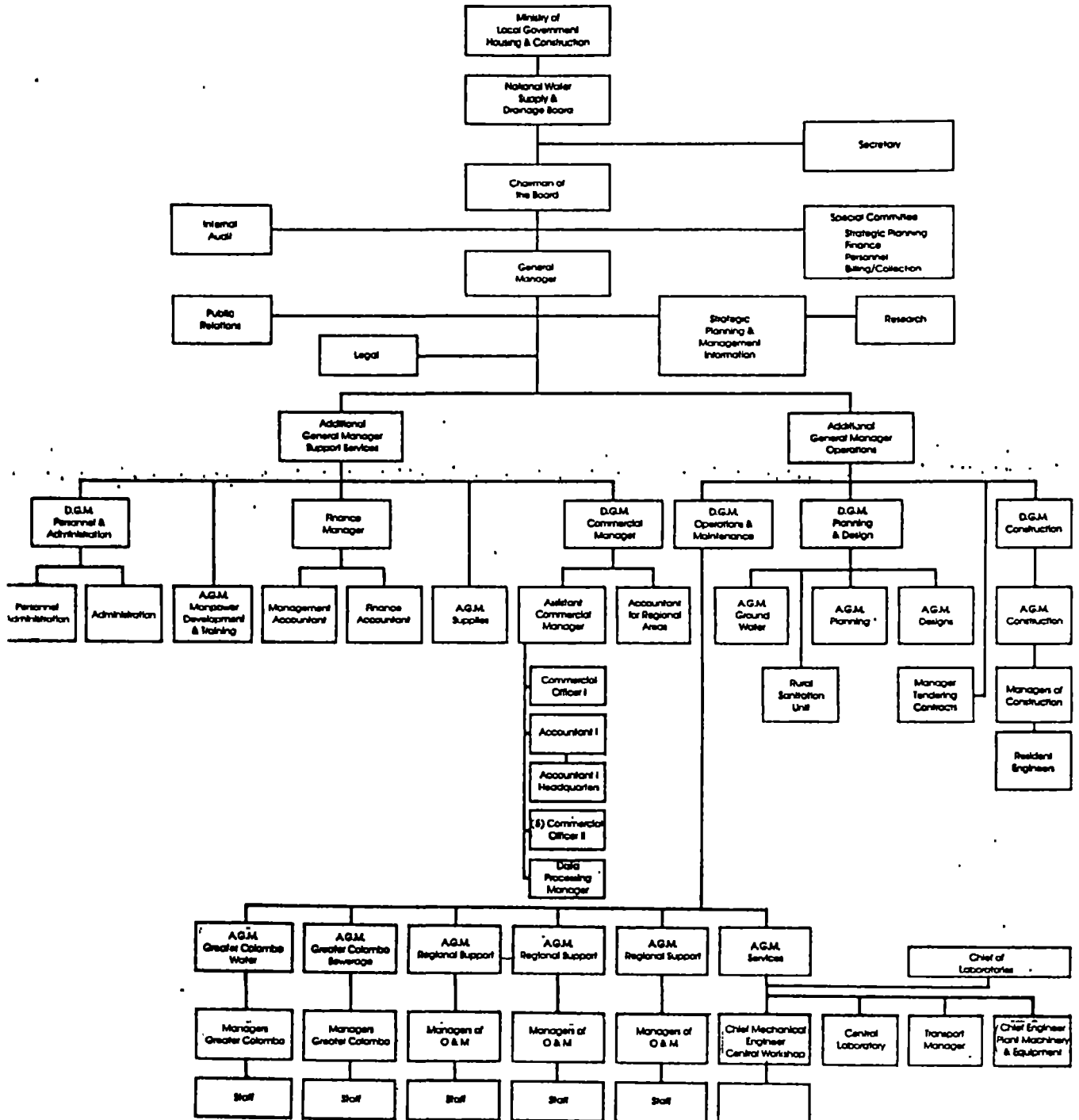
The operation and maintenance costs of gravity systems where a permanent and paid system operator is needed will be about half of the costs of the pumped system since the energy costs are about 40-50 % of the total costs. So the operation and maintenance costs of the gravity schemes can be easily recovered with revenues based on existing tariffs if about 20-30 % of the consumption is taken through house connections.

The operation and maintenance costs of small gravity systems have been calculated to be about 0,80 Rs/cu.m. The costs will include possible chemicals, transport, tools, spareparts and the salaries of the maintenance staff. The small systems will be operated by voluntary caretakers. The anticipated revenue would be the same as the operating costs, using existing tariff levels of 0,80 Rs/cu.m for standposts. Arrangements will have to be made to collect this revenue from the beneficiaries, or alternatively, the costs of operation will have to be met by the DDC. If the DDC will meet the costs of the water taken from the standposts in pumped pipe systems it is very difficult to explain to the users of gravity systems why they have to pay for the water taken from the standposts.

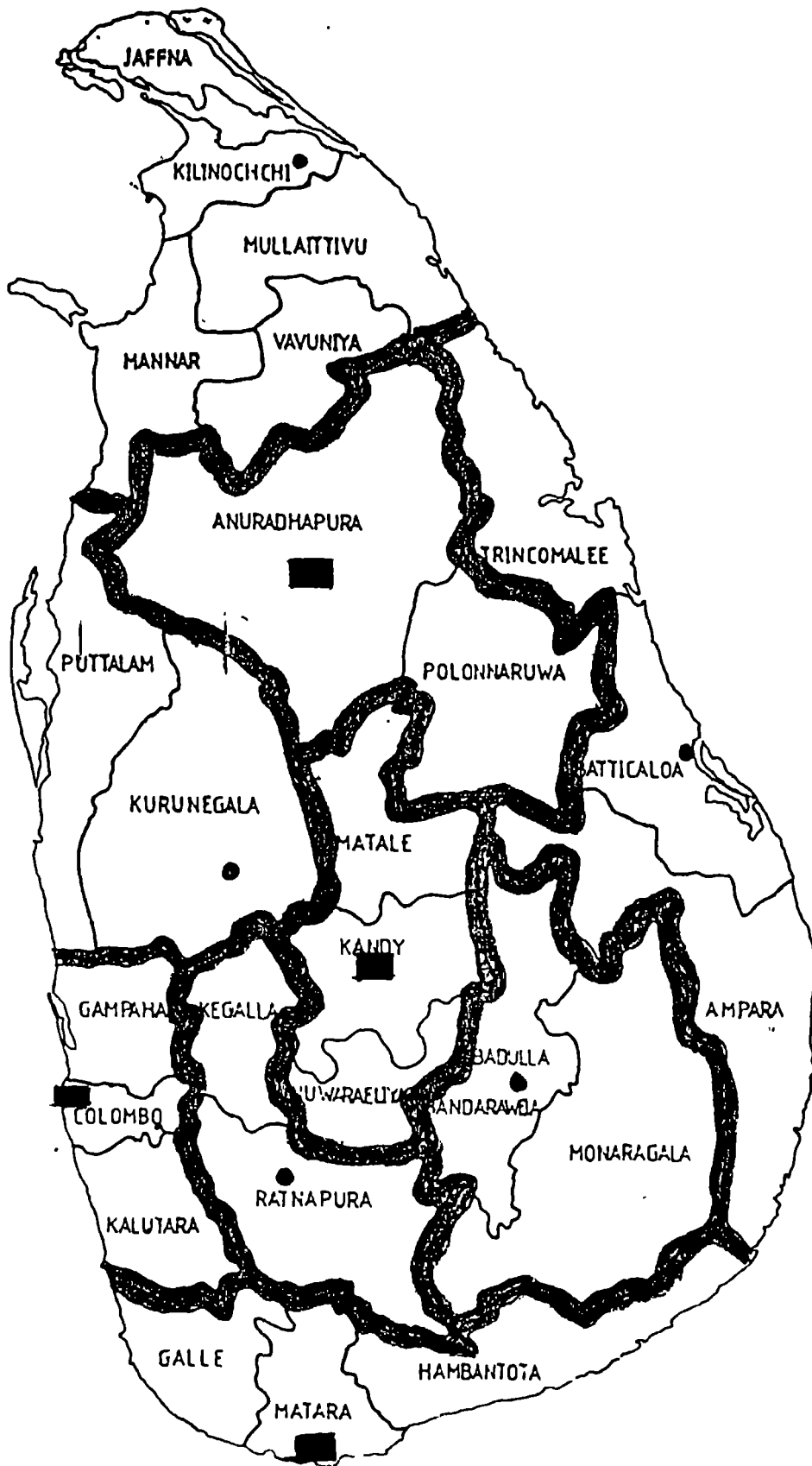
The operation and maintenance costs of a hand-pump well are given in Annex 5. It has been assumed that DDCs will organize the maintenance of hand-pump wells and NWS & DB will give assistance but will invoice the DDCs of the services. The maintenance cost will be 12 Rs/person/year or 1,10 Rs/cu.m if a daily consumption of 30 litres per capita is calculated. It has been discussed whether DDCs should meet the costs of the maintenance of hand-pump wells as they should also meet the costs of the water taken from the standposts. Another possibility is that the villagers have to meet the costs of the well maintenance but since the villagers consider that the service level of


a hand pump well is lower than that of a standpost it is difficult for them to understand why they have to pay when the neighbour is taking free water from the tap. The Government of Sri Lanka has to make an urgent decision of the policy on how to recover the operation and maintenance costs of rural water supplies so that the system is fair to all the consumers.

THE SRI LANKA WATER SUPPLY AND SANITATION REHABILITATION PROJECT  
 Organization Chart of the National Water Supply and Drainage Board



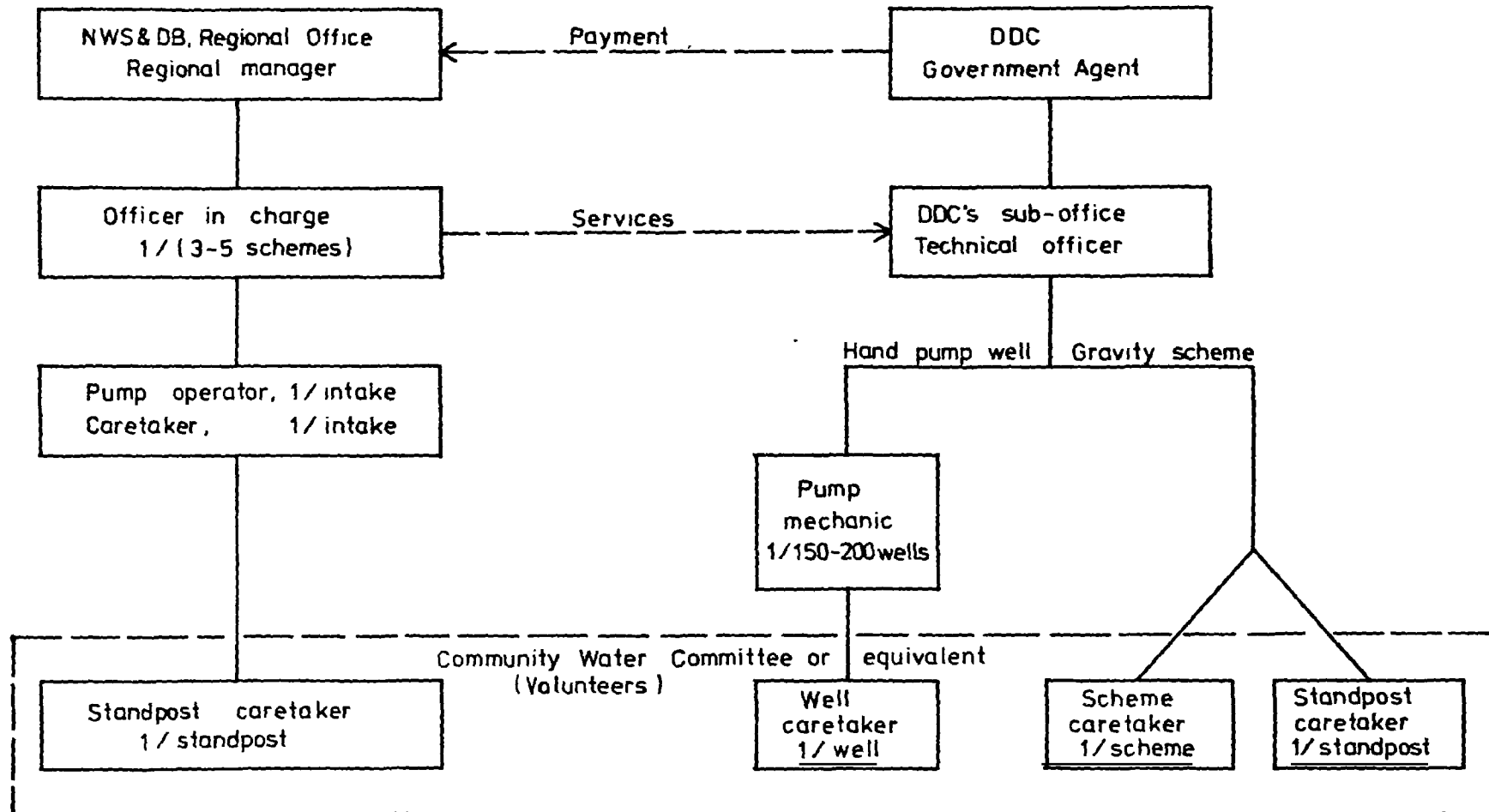
Note:  
 D.G.M. – Deputy General Manager  
 A.G.M. – Assistant General Manager  
 O & M – Operators & Maintenance



 Regional Support Center  
PROVINCIAL BOUNDARIES  
PROVINCIAL OFFICES

NATIONAL WATER SUPPLY & DRAINAGE BOARD  
LOCATION OF PROVINCIAL OFFICES

The operation and maintenance organization  
for hand pump wells, gravity schemes and pumped schemes





NWS&DB's Operation and maintenance costs

(Rs. million) and revenues (Rs. million)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Operating expenses	245	277	314	354	366	410	435	463	486	507	526
Depreciation	300	396	414	430	448	468	489	511	532	554	575
Debt service	30	225	225	244	280	320	356	396	438	479	519
<b>Total costs</b>	<b>575</b>	<b>898</b>	<b>953</b>	<b>1028</b>	<b>1094</b>	<b>1198</b>	<b>1280</b>	<b>1370</b>	<b>1456</b>	<b>1540</b>	<b>1620</b>
Revenue (Present tariffs)	328	359	395	434	475	521	547	575	592	605	616
Bad debts	164	113	91	87	48	52	55	58	59	60	62
<b>Net income</b>	<b>164</b>	<b>246</b>	<b>304</b>	<b>347</b>	<b>427</b>	<b>469</b>	<b>492</b>	<b>517</b>	<b>533</b>	<b>545</b>	<b>554</b>

## ANNEX 5

**MAINTENANCE COSTS OF A HAND PUMP WELL**

<b>Salaries</b>	<b>Rs/year/pump</b>
- Pump mechanic Rs 2500/month/150 wells	200
<b>Transport</b>	
- Motor bike Rs 1.000/month/150 wells	80
<b>Tools</b>	
- Value of tools Rs 20.000 annual replaced 15 % cost for 150 wells Rs 3.000	20
<b>Spare parts for the hand pump</b>	
- 5 % of the value of the pump value of the pump about Rs 10.000	500
<b>Maintenance from NWS &amp; DB</b>	
- 4 % of the value of the hand pump	400
<b>Total costs</b>	<b>RS 1.200</b>

Population served by the well is about 100.  
The maintenance costs of hand pump well is about Rs 12/person/year  
or about Rs 1/person/month.

## DISCUSSION

Mr. Titus wanted to know more of the plans of the Harispattuwa water project on establishing operation and maintenance systems. The reporter confirmed his view that a policy decision will be needed on how to operate and maintain water supply systems. In Sri Lanka hand-pump wells are generally considered to give a lower service than for instance standposts. If water from the standposts is given free it will be very difficult to introduce payments on hand-pump wells.

Dr. Odira wanted to know the source of funds for District Development Councils (DDCs) which is in charge of the operation and maintenance. The reporter said that those funds are taken by taxation and thus the consumers pay for the water indirectly. However, the DDCs do not pay for water taken by hand-pump wells. A flat rate would not be a proper means but perhaps some kind of taxation could be used for funding the operation and maintenance of any type of scheme.

Dr. Mashauri and Mr. Markkanen commented that the policy is really not clear in Sri Lanka. Mr. Markkanen continued that to his understanding this policy is wrong because the maintenance is based on a centralized system. There are not many countries in the world whose national water supply board maintains water supply schemes. On the other hand DDC is a very weak organization. If the centralized policy is continued a better taxation system is needed.

Ms Kurten had the view that a written policy of the government exists. However, the funds based on taxation are not sufficient. The DDCs will have to introduce consumer payments. Some of the key questions will be who collects the funds and how.

Mr. Vuori commented that probably we should also have representatives from Sri Lanka to present their views. It is important to understand and know the political views of the country. The Chairman pointed out that probably there is a lot to be learned from the experiences in different parts of the world.

The reporter replied to the question of Dr. Lucas and estimated that about 30 per cent of the water is supplied free.

Mr. Hämäläinen wondered what is the proportion of the total consumption of house connections compared to standposts and hand-pumps. The reporter said that in the Harispattuwa water supply project the share of house connections is about 35 per cent. Mr. Markkanen noted that in

the beginning of this project consumer involvement was not allowed for political reasons. The project activities are soon to be expanded from the Harispattuwa electorate to the Kandy district. In those new areas consumers will be involved from the beginning and well committees will be established. Some pilotscale tests have already been conducted.



## CONSUMER'S CONTRIBUTIONS IN COVERING COSTS FOR RURAL WATER SUPPLIES IN TANZANIA

by  
 Dr. R.O. Lucas, Chief of Designs Section, Ministry of Water Development,  
 (Reporter) Dar es Salaam, Tanzania

and  
 Dr. D.A. Mashauri, Lecturer, Faculty of Engineering, University of Dar es  
 Salaam, Tanzania

### Rural Water Supply Policy

#### Status of Rural Water Supply

In Tanzania there is a great deal of political will to provide water for all. Consequently rural water supply has been declared a free basic social service. This means that water is free of charge at the standposts (domestic points).

#### The Twenty Year Rural Water Supply Programme

As a follow-up to the declared status of rural water supply in 1971 the Tanzanian government embarked on a twenty year rural water supply programme which envisaged the provision of safe and adequate water supply within 400 m of each household by 1991. This policy declaration was later fortified by the United Nations General Assembly to designate 1981-90 an International Water Supply and Sanitation Decade (IDWSSD) (Msimbira, 1986).

#### Decentralization

In 1972 most of the government activities including the water sector were decentralized to the regions. The central Ministry then assumed a consultative role in technical and manpower development matters. The Ministry also retained the responsibility over general water policy and implementation of large national projects (costing more than TShs 5 million).

In 1975 the Village Act was passed. This provided for the formation of the Village Governments. The Village Government was empowered to raise funds for whatever development purpose is deemed fit. In the structure of the Village Government there is a water committee which is charged with the responsibility of looking after the village water schemes.

In 1982 the Local Government was re-established. These have powers to set and charge development levies.

## Community Participation

Community participation (self-help) has been repeatedly emphasized since independence (1961). At first it was met with country wide popular response. However, this enthusiasm soon waned and the momentum lost. To date the degree of involvement has generally been low and unsystematic for lack of clear guidelines.

## Appropriate Technological Mix

In the implementation of the rural water supply programme emphasis is placed on low cost and easily adaptable technology. The following technological mix has been adopted: 50 % shallow wells, 20 % gravity schemes, 15 % surface pumped schemes and 15 % borehole pumped schemes. Thus the policy is to minimize on schemes of potentially high operational and maintenance costs (pumped schemes).

## Cost of Rural Water Supply

### Estimated Cost of the Rural Water Supply Programme

Before and shortly after independence (1961) local authorities contributed 25 % of the capital costs of water supply projects and also carried the main responsibility of scheme maintenance (Mujwahuzi, 1976). In 1965 the Technical Ministry responsible for water affairs assumed full responsibility over capital costs of rural water supplies. In 1969 it also took over operation and maintenance (Shirima & Brandstrom, 1983). This policy has placed a heavy financial burden on the government, a burden which has steadily been growing as more schemes have come into operation.

In a Decade Sector Report (IDWSSD, 1982) it is stated that at the beginning of the Decade (1981) only 6.3 million people out of a total rural population of 17 million had access to clean water. With the current population growth rate of 3.3 % (Budget Speech, 1985) the rural population in Tanzania will be 21.5 million by 1991. Thus an additional 15.2 million people were yet to be served with clean water in the time space of 10 years. The needed funds were estimated at TShs 18 billion. This is immensely in excess of the prevailing level of investment in the rural water supply. Furthermore, since 1978/79 the government annual budgetary allocation has been going down year after year.

## Donor Assistance

Donor's policy has been to contribute to development costs only and leave the responsibility for operation and maintenance costs to the ministry. Nevertheless, because of the great concern over the mounting problems in operation and maintenance of existing water schemes, some donors

have undertaken to introduce a set-up which provides for community participation in a limited number of their supported projects (pilot schemes).

### Consumer's Contribution Options

The realization of the importance of community participation (as a cost saving device) at the United Nations level is documented in Feachem (1980) and it states in part... "The Decade approaches, pleads, states, exhorts or demands that community participation must be included in all water supply and sanitation projects".

What remains to be done is to organize the options we have in this community participation programme. Since the responsibility of providing water to the households in Tanzania is "still" that of the women, then it is obvious that their (women) full involvement at all stages of planning implementation and operations as well as maintenance of the water schemes is institutionalized. The women's participation has been obligatorized in some schemes/projects by some donor agencies (Kleemeier, 1987). This type of action is isolated, good as it is, so the government should popularize and formularize it into a policy statement.

The Decade's target of providing water for all by 1991 in Tanzania is highly unrealistic. The present rate of providing water to about one million per year means that at the end of the Decade only 15 million people out of the anticipated 26 million will be supplied with water. The situation is more so, not only due to the capital investment the government has to make but also the cost of operation and maintenance of the ever increasing number of water schemes.

The argument of planning for cheaper technologies is viable but even with these cheaper but workable technologies the government will have to invest a considerable amount of money. This could be complemented by the people's contributions towards construction, operation and maintenance costs. The people's involvement has an in-built advantage of the ownership feeling to the recipient community and can reduce vandalism of the schemes.

It is the felt need of the villagers for a particular improvement which determines their willingness to contribute. This is determined by making clear at the beginning, the total cost involved, expected contribution from the community in terms of labour, materials, cash as well as the subsequent water tariffs. This must be based on an agreement acceptable to both the recipient community and the implementor.

The general willingness of the communities to contribute is well documented in some Water Master Plans which shows



the importance set by people on water projects. The contributors from the communities could be organized in the following manner:

- a) Cash contributions from individual households set by the village water committee.
- b) Cash contributions by members of the village communities working in the urban centers, sort of Home Village Associations.
- c) Communal contributions from the village, village shop or the grinding machine.
- d) Levies from individuals' crop sales to the market, levies on the local brewing individuals and levies on any other incomes as may arise in the localities.
- e) Lotteries and entertainment contributions towards the cost recovery of the water schemes.

The village government will have to open a bank account where the funds (revolving funds) could be safely kept for future use. The village government is also vested with the powers for the appropriation of the funds so obtained.

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## DISCUSSION

Dr. Mashauri, the second author of the paper pointed out that some surveys done in Tanzania indicate the willingness to pay for water. This concerns particularly women who actually draw and carry the water. For instance, in the Hesawa project it was stated that all village water committees should include women. Another point is the slogan "community participation". Instead of a poor slogan approach something concrete should be achieved, too. The

technical aspect should also be included. The costs of promotion activities such as campaigns should also be counted.

**Mr. Titus** wondered why the government took over the responsibility of the water sector. **The reporter** referred to the well-known Ujamaa-programme where people at that time were not considered able to do something by themselves. The importance of water for general development was realized soon after the independence. However, now it is clear that the Government cannot give increasing contributions to the water sector.

**Prof. Viitasaari** referred to his earlier comment on the Ujamaa policy which can be undermined by giving free water. If the water supply schemes had been kept in operation the government would have realized a long time ago that this is not possible. Naturally the costs can be covered by taxation. However, this is not fair for those who pay for taxes but are without water services.

**The reporter** commented that taxation could be used at the village level for specific purposes. **Mr. Purhonen** requested the reporter's view on how consumers should pay for water from rural piped schemes if the cost-recovery concept is introduced (direct or indirect payment). **The reporter** referred to the water supply problems in Dar es Salaam. So-called small consumers charged by flat rates can in practice consume a lot of water. There are cases even in the city center where rates have been determined during the construction and not by measuring the real consumption. For monitoring flat rates are not appropriate but direct methods should be preferred. However, in poor communities it is much more difficult.

**Dr. Mashauri** pointed out that for instance coffee-growers usually get their income once a year. This has to be taken into account in possible payments. The same applies to nomadic people. Thus the payment should be decided individually for each place rather than applying a fixed payment for all areas and regions.

**Mr. Titus** wondered whether there are signs of donor interest in operation and maintenance. **The reporter** replied that in principle the donor contribution is of temporary nature. So far donor contribution is limited to construction. By appropriate technology the operation and maintenance costs are minimized. The supported projects hand out the responsibility of water sources to the villages for example, by using certificates.



## **COST-RECOVERY ISSUES IN REGIONAL WATER RESOURCES PLANNING IN MTWARA-LINDI REGIONS, TANZANIA**

by  
Mr. Osmo Purhonen, Viatek Ltd

### Introduction

The Mtwara-Lindi Water Master Plan was prepared in 1974-76 and finally completed in March 1977. After that, the development of new Water Supplies has been carried out partly by MAJI (The Ministry of Water) and partly by the FINNIDA supported Mtwara-Lindi Rural Water Supply Project. During the implementation the Plan has been followed, although recently the emphasis has shifted from piped water supplies towards more appropriate technologies, particularly hand-pump wells.

It was decided in 1984 that the Water Master Plan needs to be reviewed and this work was carried out during 1984-1986. The work included:

- inventory of the prevailing water supply situation
- water resources review
- preparation of water supply development plan for 1986-2001.

### Present Situation

The water supply situation in the Mtwara-Lindi area is theoretically good: about 80 % of the population lived within the service areas of improved water supplies in 1984. However, only 27 % of the population had regular service according to the standards whereas 53 % of the population had only limited or no service from their improved water supplies. About 20 % of the population had no improved W/S.

The main reason for the unsatisfactory operation of water supplies was the lack of fuel and spares. This was partly due to the lack of funds and partly due to the non-availability of those goods.

In the allocation of funds, the share of the operation and maintenance sector was and has for quite some time been much below the requirement.

The present (1984) cost-recovery in the water supply sector is practically non-existent. Water charges are only used in house connections in urban piped water supplies and even there, the fees do not cover the operation and maintenance costs. The collection of water charges is also unsatisfactory.

## Planning Criteria

The main criteria of the plan covering the period of 1986-2001 were:

- improved and functioning water supply for everybody by 2001,
- water quality satisfaction,
- selection of appropriate technology including manpower, fuel spare parts supply and financing, and
- the cost and recurrent development and the present level.

## Cost Recovery Issues in the Plan

### Cost Recovery as a Mean of Financing

During the preparation of the plan it became clear at early stages that one of the most important factors setting limits to the planning was financing. The 1984 level of financing was TAS 70 million (40 million for development costs and 30 million for recurrent costs). All funds came from the Central Government or from donors and practically no funds were collected from the consumers. Community participation provides some financial savings in construction of pipelines in rural areas.

The rapidly growing population requires extensive investments for the development of new water supplies and the existing and new water supplies require more funds for operation and maintenance.

In the plan the lowest acceptable level of technology and service was selected: hand-pump wells whenever possible and no new piped schemes in the rural areas, only extensions and rehabilitation of several existing ones. Even this required increased financing from TAS 70 million 178 million in 2001. Since the Government contribution could not be increased and the donor contribution was rather decreasing than increasing, the only means to cover the gap was local financing, either through the levies (taxes) collected by the local councils or by collecting funds directly from the consumers. The latter alternative was favoured by the local officials.

The plan recommends the introduction of water charges at rural piped water schemes. The villages are recommended to take care of the hand-pump wells while the water officials give only technical advise and help in getting spare parts.

In general, the plan promotes the idea of people being more responsible of their water supply in all its stages. Paying for the operation and maintenance of their water supply is believed to help people understand this responsibility.

### Cost Recovery - Selection of Technology and Service Level

When people with an average GDP of about TAS 1800 = USD 100 per capita are requested to pay for their water to cover at least the O & M costs this leads to the selection of low-cost technologies requiring no or little fuel and only simple maintenance. Hand-pumps seem to fulfil the requirements although in some cases even more simple solutions would be better suited.

### Cost Recovery - Level of Service

According to Tanzanian standards, everybody should have clean and wholesome (25 l/cd) water within 400 metres walking distance. In case of a water supply, which people can afford - i.e. a hand-pump well - this criterion cannot always be fulfilled. For the rural consumers in the area the sufficient quantity is the most important matter. The walking distance up to 2-3 km was considered quite acceptable by the consumers.

### Institutional Aspects

On the institutional and management levels cost-recovery creates some problems:

- how to collect water charges for communal water points or hand-pump wells
- who should collect the charges
- how to guarantee that the collected funds will be used for the particular scheme
- etc.

In the Water Master Plan these problems were not solved. Only the principle of equal treatment of consumers was stressed meaning that water charges should be uniform for the same type of service.

### Constraints

Although the importance of cost-recovery was realized in the plan and accepted by all concerned, it was agreed that the matter requires careful preparation and needs to be decided upon on the national level. It was equally agreed that if cost-recovery is not introduced the deterioration of water supplies and their poor operational level will continue.

### DISCUSSION

Prof. Viitasaari reminded that it is not possible to use shallow hand-pump wells in every area of the region. The reporter answered that the project has developed methods to construct medium deep boreholes equipped with hand-pumps. The areas without shallow ground water seem to lack other alternative water sources except the medium deep or deep ground water.



## ECONOMIC POTENTIAL FOR COST-RECOVERY AND CONTRIBUTIONS IN RURAL DEVELOPMENT

by  
Mr. Seppo Outinen, Director of Research, Association of Finnish Cities

### Use of Water

Before considering possibilities of water payments we have to make distinctions between the different water usages and purposes. We can regard water as a natural resource, foodstuff or necessity for health. Water can be used for municipal, industrial, recreational, irrigation, hydropower generation and different combined purposes.

### Income per Capita in Different Parts of the World

Table 1 shows a summary of annual income per capita in OECD countries, Japan and North America as well as Africa, Asia and Latin America. In 1984 the income per capita in Africa was about 700 USD whereas in Asia about 600 USD. The growth rate in Africa has been only 22 % but in Asia over 100 per cent. However, between 1980 and 1984 the income per capita decreased about 2,5 % in Africa and Latin America. The figures naturally vary a lot between different countries. The general implication of the figures is that in developing countries there are very low possibilities for full cost-recovery.

Table 1. Income per Capita in Different Parts of the World in 1960 and 1984.

	INCOME PER CAPITA (IN US DOLLARS PRICE 1981)		
	1960	1984	GROWTH %
Whole OECD	5,304	10,220	92,7
OECD Europe	4,378	8,108	85,2
Japan	2,820	10,907	286,8
North America	7,891	13,150	66,6
Developing countries	391,0	729,0	86,4
Africa	580,0	709,0	22,2
Asia	257,0	571,0	122,2
Latin America	1,400	2,276	62,6



## Examples from Finland

In the Finnish Local Government budgets the share of different types of fees is on average about 16 %. In towns the figure is about 20 % and in other municipalities about 8 %. Of these fees water and sewage fees together are less than a half or one third. In 1987 the average water and sewage fees are as follows

- \* water 2,99 FIM/m<sup>3</sup> (1987)
- \* sewage 3,64 FIM/m<sup>3</sup> (1987)
- \* total 6,63 FIM/m<sup>3</sup> (1987)

On the whole the water and sewage works do not reach the full cost-recovery level at present prices. Consumers can still complain that the prices are too high. Therefore money collected by taxation is also needed.

In Finland a national committee has studied the use of fees instead of taxation. Their experiences show that fees are better than taxation when

- \* fees can diminish spoiling,
- \* benefits can be identified according to the user,
- \* non-payers can be "kept out" easily, and
- \* fees are justified (proper).

## General Factors on Cost-Recovery

Consumers' willingness to pay for services is fairly limited. Generally people do not want to pay unless they are absolutely sure of the real need for payment. Thus the explanations used can influence the consumer in deciding whether the fees are justified or not. The amount of fees as such is probably less important.

Taxation is one alternative for collecting funds also for water and sewage services. A consumer can pay taxes to support schools, child caretaking and other municipal services although his or her family does not need these services. Still the consumer does not complain. Thus in principle it would be possible to explain cost-recovery needs in water also by taxation. What is needed is advertising, "selling-out" the idea to the consumers. Thus there are many possibilities to solve the cost-recovery needs.

The committee mentioned above listed several factors to remember when considering cost-recovery.

- (i) What is the need for cost-recovery?
  - \* proportion (investment/operation)
  - \* structuring of fees (taxes)
  - \* effects of fees on income
- (ii) How do the fees affect consumption
  - \* e.g. if we want to control the consumption
  - \* per month, per day or night, seasonal variations

- (iii) How do the fees affect the use of capacity?
  - \* possible postponements of investments by the decreased consumption followed by increased fees?
- (v) Who decides and controls?
  - \* community/consumer level
  - \* treasury at the governmental level
- (vi) Should fees be equalized in the whole country or regions/areas?
- (vii) How to take into account local factors and flexibility?
- (viii) Do we need different levels of fees (at the same time) and to what extent?
- (ix) Who collects the fees and for what purpose?
- (x) How is the collected money used?

Connected with mini-hydropower development in Kenya a market survey was done to estimate the feasibility of rural electrification. Among others the following topics were discussed.

- \* Central/local government and their policies
- \* Areal distribution and supply
- \* Urban, semiurban, rural areas
- \* Supply by household or by community
- \* Economical status
  - \* central government
  - \* local government
  - \* households
  - \* individuals
  - \* enterprises
- \* Employment, salaries, self-help
- \* Order of importance of different matters.

Finally I would like to point out that each country and even region has its own features and needs. The Finnish system of fees is not the best one but still it seems difficult to change it. Possible needs for changes should, however, be considered continuously. For instance, we do not pay for the use of streets. Still we have to pay if we happen to live on the very same street. Thus when we are using water we do pay for that but when we are using streets we do not pay.

## DISCUSSION

Mr. Häkkinen asked the reporter's view on how long it will take to convince the consumers about the necessity of

payments (particularly when a government has announced that water is free for all)? **The reporter** replied that probably this may take even decades because the attitudes tend to change slowly.

**Prof. Viitasaari** went back to the issue of explanation connected with willingness to pay. He referred to the example mentioned by Dr. Lucas on a dry tap in Dar es Salaam and a consumer, paying for rural water supply somewhere else. In this case the situation is perhaps not experienced too negatively. But if it is vice versa the situation is probably thought really bad; in other words when someone in a very remote area has to pay for the water supply in the capital. This can well happen if the fees are collected as taxes. Thus fees collected from the real users of water should be preferred instead of taxation.

**Mr. Purhonen's** view was that it will not necessarily take generations to convince the consumers on the need of payment. Payments should be organized so that they give directly the benefits to the consumer. If the funds are taken away from the area and then distributed via the central budget, it will take time. **The chairman** commented that the need of convincing the user of the payments depends on the tools we use.

**Mr. Markkanen** said that taxation does not necessarily lead to the flow of funds from rural to urban areas. Taxation can be organized also by the local government as in Sri Lanka. Today the official policy is that the costs have to be covered by taxation via the DDCs.

**Mr. Purhonen** described the experiences from the Mtwara-Lindi water master plan revision. The people involved in the water sector were very strongly against fund collection by the local governments and distributed back through their budgets. They were convinced that the district councils have their own priorities such as health centers, roads, schools and transport means. Water will be given a very low priority. It is obvious that the water sector will not get a fair share if funds are collected via taxation. **Mr. Markkanen** reminded that also in Finland the local taxes were used quite recently.

## DEVELOPMENT OF RURAL WATER SUPPLIES IN FINLAND SINCE THE 1940's

by  
Mr. Pekka Hämäläinen

In 1950 the Household Rationalizing Committee sought the Government support for rural water supply. The Engineering Department of the National Board of Agriculture was suggested as the supervisor of the implementation expenditures.

In 1950 the Department collected statistical data and conducted a special field survey. This information gave a picture of the situation in water supply of Finland in 1950. The conditions were shortly as follows:

* Total population	4 200 000
* Population in townships	1 300 000
* Population in countryside	2 900 000
* Out of which scattered	2 300 000

### In the rural households:

- \* Piped water in the kitchen for less than 10 % or about 150 000 inhabitants
- \* Out of the above figure common piped systems for one third or about 50 000 inhabitants
- \* A ground water source was utilized in over 90 % cases
- \* The source was a well or a spring
- \* The well shaft structure was in 30 % of cases wood, 30 % stone, 30 % concrete and 10 % other material or a combination of different materials
- \* The most common transport device was a bucket, 83 %
- \* The average carrying distance was 54 m
- \* The water level from the ground was normally 2-3 m
- \* In 93 % of cases water was lifted from the well manually.

### In common piped water supply systems:

- \* Surface water source was utilized in 91 plants out of 286
- \* In 34 cases out of these 91 treatment was applied, in 57 plants no treatment was utilized but the surface water was led straight into the pipeline
- \* In 87 % of the total length, the pipes were wooden, drilled tree trunks
- \* Areally the most plants were located in the Province of Vaasa (60 %) and in the South-Western Provinces (24 %).

In the countryside the water quality in the 1950s was generally poor due to inadequate water treatment, wooden pipes and contamination of wells. In half of the cases the iron content was too high and due to carbon dioxide and softness, water was also aggressive.

The materials and the energy applied were mostly of domestic origin due to the restricted economical resources in the country. Five years after the Second World War the war compensations were still under payment and a partial rationing of foodstuffs still existed.

Since 1950, especially during the 1960s and 1970s, a strong urbanization took place. At the same time water supplies were constructed also in the rural areas, even in the areas with scattered population. The situation in 1980 was shortly as follows:

* Total population	4 800 000
* Population in townships	2 900 000
* Population in countryside	1 900 000
* Out of which scattered	1 300 000

In the scattered population areas:

- \* Water supply was provided for 70 % or 900 000 inhabitants
- \* Out of the above figure one third or 260 000 were supplied from a common pipeline, the rest utilizing own systems.

During this 30 year period rural water supplies have been constructed with Government support in the form of grants and soft term loans.

From the above we can see that single houses with a piped water supply are the most common cases. The second is the old fashioned bucket and well system and only in the third place we can find the larger area piped system (figure 1).

In 1970 the coverage of piped water in rural households in Finland was about 70 %. Nowadays the figure is perhaps 80 %. In 1990 there will still be households without a piped water supply.

In the countryside the small water supply plants are operated with the non-profit principle after being constructed with Government support. It is hardly possible to find a plant which would provide cost recovery to the Government. Nowadays in Finland only in big townships the water works can make a profit.

In statements made in programmes concerning even extensive areas it can be expressed that everyone is to be provided with safe water before a certain year. This is not possible as we can find out from the data above. Technical and economical aspects are always to be kept in mind.

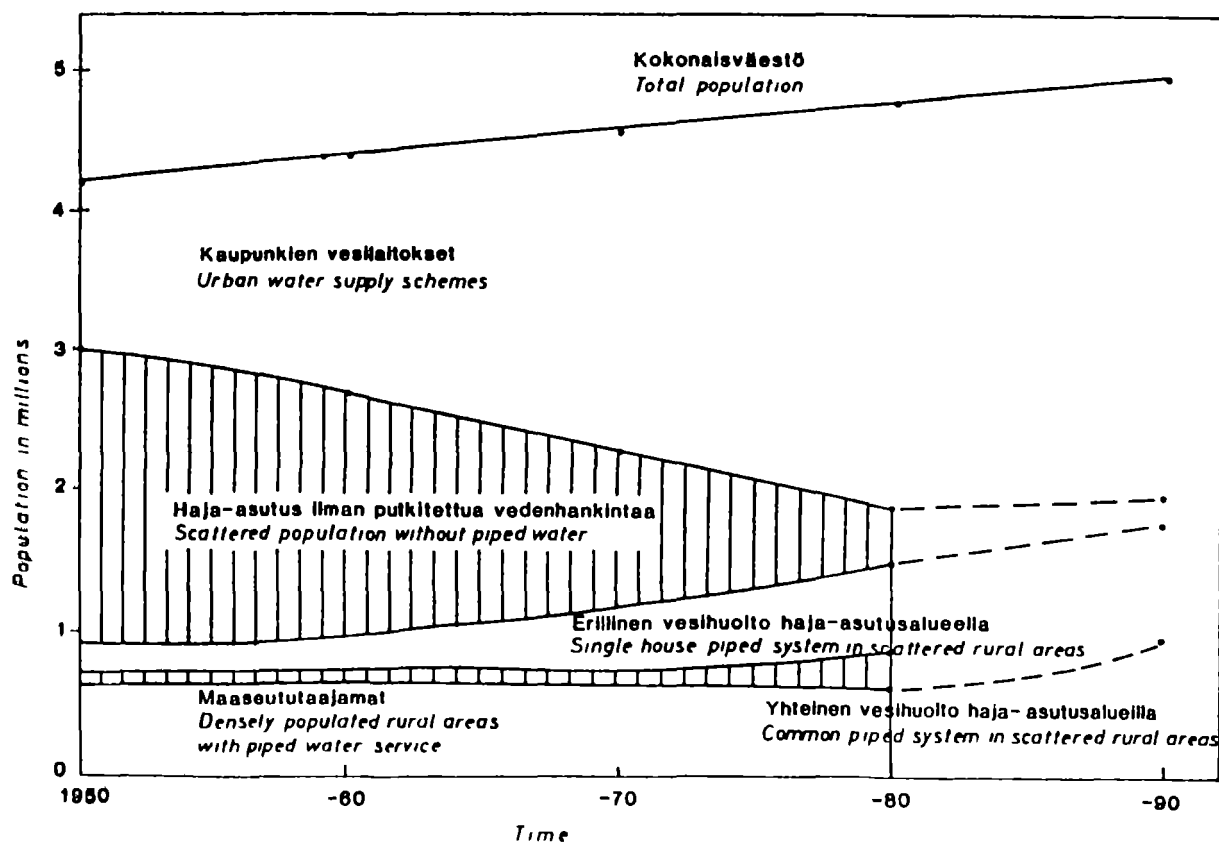


Figure 1. Development of Rural Water Supply in Finland 1950-1990.



**ON THE PROBLEM OF PRIVATE, PROFESSIONAL, AND PUBLIC CONCERN  
IN THE IMPLEMENTATION OF DEVELOPMENT PROGRAMMES**

by

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In his intervention professor Anil Agarwal of India advised to forget both experts and politicians and to listen instead to the poor themselves in developing countries in order to know how to make better their daily life. (News reporting in Hufvudstadsbladet 11.5.1987 from a Scandinavian conference on environmental problems in Sweden).

In this statement the distinction between private, professional, and public is taken as a point of departure.

Happy Versatility?

In the modern social theory a distinction between private and public is often taken for granted. Against this conception we may pose the words of an ancient Greek, Pericles, proclaiming the happy versatility of the mode of being:

WE RELY NOT UPON MANAGEMENT OF TRICKERY,  
BUT UPON OUR OWN HEARTS AND HANDS!

In this happy versatility of the ordinary man severe training and intense specialization were not necessary in order to form an intelligent judgment of political and social questions.

All these social performances imply social concern, awareness of a problem which is waiting for a solution and which is of some relevance to many.

The point in Anil Agarwal's remark is that this concern derives its substance from the social station of the men involved. An ordinary man, a professional expert, and a politician are hence all concerned but they do it in different ways. The notion of happy versatility implies that the professional concern carries the marks of his training and of his professional community, i.e. of discipline and specialization. He has a mind which is trained and controlled. That is his problem as he engages living conditions.



Ordinary man "in the village", in turn, carries the burden of tradition. He carries the wisdom of previous generations but he carries also social and psychological constraints, a pattern of compulsion.

The problem is hence one between the custom and the reason. The happily versatile ancient Greek did not follow the custom merely because it was an accepted tradition; he expected to become convinced that the proposed course of action was correct. As a citizen he displayed rational capacity to convince and to be convinced.

The necessary impediment to social action rested in the institution of free and full discussion of policy, not as an institutional precondition of freedom but rather as a source of knowledge.

The happy versatility of custom and reason may be achieved in development programmes only if the layman's wisdom is accepted as a legitimate source of knowledge.

#### Private, Public, and Professional

If we now accept the distinction between private and public (what we should not do!) as a matter of fact either

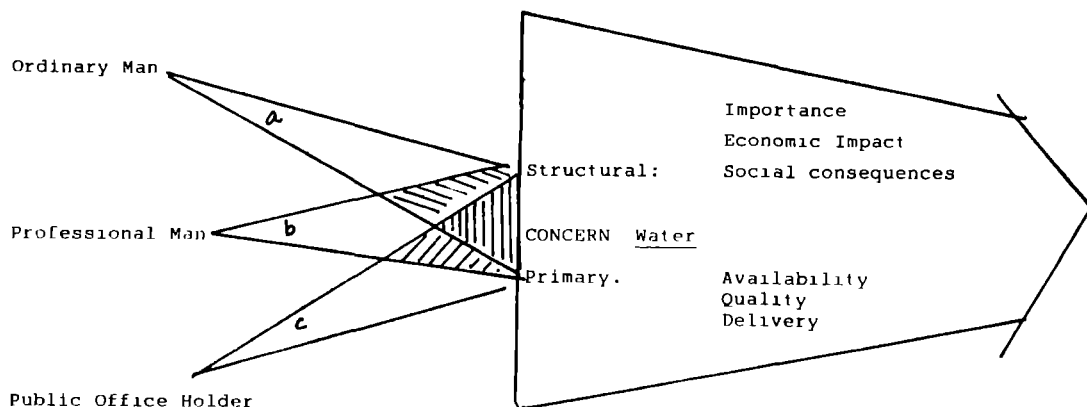
a) because it is very common in the Western and the Westernized societies anyhow,

or

b) because the conception of public in our sense of the word never has reached those villages and households where development programmes are implemented (f.e. autonomy of local administration)

then we may conceive that the implications to practical concerns may be very substantial. A politician is concerned of a water problem from a different point of view than the head of a household or a member of it. The professional concern of an engineer or of a health worker may be something intermediate but distinct from both of them.

This set of questions may be posed as a field of complementary concerns. (See the Table).



It is easy to see that these three concerns may overlap only partially, sometimes perhaps not at all. Some imaginary examples may illustrate the problem of conceiving a "program" in this situation:

#### The Quality of Water:

Ordinary Man: It tastes good/bad/odd

Professional Man: It is microbiologically clean, a bit hard, muddy but drinkable

Public Officer Holder: It is there and it better taste good and be healthy!

#### The Cost-Recovery:

Ordinary Man: Is it worth the sacrifice?

Professional Man: How much is enough?

Public Officer Holder: What is the demarcation between a public service and private benefits and who after all benefits?

### Program Implementation

Is the Ordinary Man happily versatile in practice? Does he integrate his household, village, and local roles with the role of a citizen who is aware of national concerns in the issue of water?

If the answer is yes, then we do not have fundamental problems in designing a program which integrates the points of view (private, public, professional).

If the answer is no, then we may have a big problem. How do we convince the Ordinary Man that the Professional Man and the Public Office Holder do conceive his problems correctly and solve them in a right way? Are we aware of this gap in planning the program?



