

weightage to the low-income group, because the total number of the domestic consumers is much higher than the low-income group. Since poverty alleviation is an important objective of both the projects, and also of the Government of Sri Lanka, provision of a higher emphasis on the households was considered appropriate.

The time allocated for the evaluation was a major constraint. Accordingly, it was decided to use cluster sampling and systematic random sampling techniques for selecting the representative households for the two projects.

After the household survey was completed, 35 commercial enterprises were selected from five main towns: Talangama, Malambe, Kaduwela, Kesbawa and Piliyanda. Relevant information was collected from these enterprises through a structured questionnaire.

The questionnaire was pre-tested prior to the conducting of the household surveys. Several modifications were made on the basis of this pre-testing. In addition, after the first two days of interviews were completed and the results were reviewed, some further changes were made in the questionnaire. This modified questionnaire was then used for conducting the rest of the household surveys,



Students of the University of Colombo undertaking a survey

The average household surveyed contained 4.25 persons, and percentage of population over 60 years of age was 10.7%. The number of female population was 50.7%. Females headed 18.3% of the households surveyed. Nearly 17% of the heads of households had either no schooling (3.5%) or primary education (13.5%), 38% had secondary education, and only 6.7% had higher education. The male heads of households were more educated than the female heads.

Majority of the households had incomes within the range of Rs.10,000 – Rs.20,000. 78% of male heads were employed, compared to only 26% of the female heads. Slightly over half (54%) of the

female-headed households could be considered to be poor. Nearly 95% of the households owned their own houses.

As soon as water supply was available, slightly over half the households surveyed (51.2%) promptly requested and obtained the water connections. When asked the reason for the delay in getting the water connections, nearly 61% cited financial constraint and another 12% felt that water connection was not a priority consideration, because well water was available. NWSDB became aware of this financial difficulty, and thus in 2001, introduced an installment scheme for the connection charges. Since then, the number of low-income households receiving piped water has increased very significantly. The current installment scheme should be reviewed to see if the present system can be made even more attractive economically so as to encourage more poor households to join the systems.

The water use patterns have changed significantly after the two projects were completed. Prior to the implementation of the two projects, nearly two-third of the households had wells within their properties, and 95 percent of the households were reasonably satisfied with the qualities of well water. Vast majority of the households (81.6%) that had wells have continued to retain these wells. Currently these households use both piped water and well water for various purposes.

Majority of all the connected households (53.5%) now consume only piped water. The balance (46.5%) use both piped and well water. An important and unexpected finding of the evaluation is that at present an unusually high number of households (30%) are using well water for drinking, and slightly more (33%) for drinking and other purposes. This is contrary to what was expected when the projects were formulated.

Before the two projects were executed, 30 percent of the households had to use wells outside their properties. Now only 5 percent use such outside wells. Unprotected wells have now completely disappeared from the project areas.

In terms of the overall performance of NWSDB, nearly 75% of the households considered it to be very good or good, and another one-quarter considered it to be average. Only 1/5th of one percent of the households considered the Board's performance to be very bad. Similarly 94.6% of the households were highly satisfied or satisfied with the services they have received from the Board:

only 6.6% were not satisfied.

In terms of water pricing, slightly more than the 2/3rd of the households felt that it was not so high, 28% considered it to be high, and 5% to be very high.

Another important anomaly observed was that more people are now boiling piped water compared to when they were using well water, and this difference is more pronounced in the upper middle class families. This is exactly the reverse of what was expected when the projects were planned.



A Traditional Well

Among other important findings of the evaluation are:

- ◆ Projects have been very beneficial to the elderly, disabled and sick people;
- ◆ definitive conclusion cannot be drawn in terms of improvements in the health conditions of the people: many claimed that their health conditions have deteriorated; and
- ◆ women felt that the two projects have contributed to significant positive changes in their lives; the extent and type of the benefits received varies from one social class to another.

Sustainability of the projects

In the final analysis, the sustainability of the projects will depend on the sustainability and the efficiency of the institution that will be responsible for managing them. This means that in order to evaluate the sustainability of the projects, it is necessary to evaluate the institutional efficiency and sustainability of the Board.

The draft national water policy (2002) has proposed certain concrete steps which should improve the economic sustainability of the Board. Among the steps are:

- Water tariffs in the urban areas should recover operating costs and depreciation, and should be increased gradually to recover full supply costs,

including debt service and a reasonable rate of return;

- Cross-subsidies between commercial/industrial and domestic consumers should be reduced;
- Levels of non-revenue water should be significantly reduced;
- Life-line tariff should be made available for the poor people; and
- Water demand management practices should be implemented.

The proposed policy is a step in the right direction, and the main issue at present is its proper and timely implementation on a long-term basis.

In terms of water tariffs, the final decision to increase them is essentially a political process. This means that there is a danger that the tariff increases proposed by the Board may or may not be approved in a timely manner, or to the level considered necessary for proper cost recovery. There is no question that during the 1990s, there have been continuous improvements in the methods used to set the tariff structures, the levels at which the tariffs were set, and the collection of the revenues from the consumers. These are very important positive developments.

Overall income of the Board is an important consideration since heavy investments will be needed in the coming years to meet the targets established in the draft national policy for the provision of urban water supply and sewerage services. The total debt service costs of the Board have already increased from Rs. 208 million in 1997 to Rs. 854 million in 2002. These costs will further increase appreciably in the future. Thus, continuing fiscal prudence and higher institutional efficiency will be two important requirements from the Board.

In order to meet the higher debt service costs as well as higher operation and maintenance costs, and assure reduced cross-subsidies between the consumers, and also between the projects, income of the Board has to be increased, and the unit costs of providing the various services have to be reduced to as low levels as possible and as early as feasible. All these objectives need to be pursued concurrently.

The income of the Board from the sale of water depends on the number of connections, prevailing tariffs, amount of water used by the consumers, and billing accuracy and bill collection efficiency of the Board.

The number of connections given by the Board has increased by 827 percent since 1990. This is a very

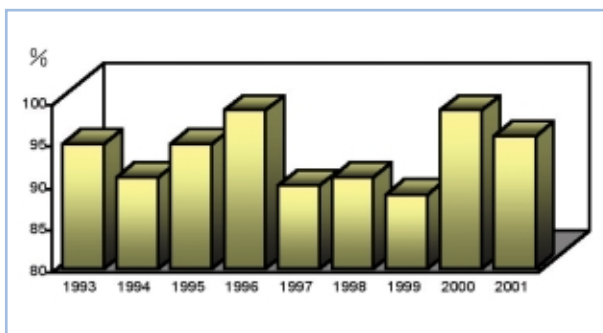
commendable progress. However, the connection rates have to be further increased if the national policy of universal coverage by 2010 is to be reached.

The demand management policies of the Board have already led to the reduction in per capita consumption in the country. For example, the per capita daily consumption of water in Colombo was nearly 200 litres in 1995: it is now 140 litres. If this demand can be reduced further to 100 litres, which is feasible, the current demand of 246,000 m³ /day could be reduced by about 60,000m³ /day, which coincidentally is the quantity of water that the Phase 1 of the Kalu Ganga project will deliver at an estimated capital investment of U.S. \$84 million. Thus, soft options like demand management and water conservation will require increasing attention from the Board and the donors to meet the identified social goals in a cost-effective and economic manner.

Currently domestic consumers account for slightly over 60% of the total water sales by the Board, but it accounts for 36% of its revenue. In contrast, government institutions consume 11.3% of water but account for 25.2% of the revenue, and commercial and industrial customers consume 9.1% of water, and contribute to 21% of the revenue.

This means that if the cross-subsidies are to be phased out completely, the domestic customers will have to pay progressively higher rates for their water consumption.

The bill collection efficiency of the Board has been excellent. During the 1992-2001 period, annual bill collection efficiency has varied between 89% and 99%. In the future, the Board should be able to maintain at least a 96% efficiency.



The bill collection efficiency of NWSDB (1993-2001)

A very important economic loss to the Board has been due to the extent of non-revenue water (NRW). For example, at present, the Board is billing for only about 65% of water it produces for

the Greater Colombo area. For Colombo City, which has an old water supply system and extensive informal settlements, NRW accounts for 53 percent of the water produced.

Appropriate policy measures need to be urgently taken to reduce such high losses due to NRW. For example, if Colombo City is considered, out of 85,000 connections, it is estimated that around 20,000 water meters are defective, and another 30,000 households receive estimated bills. Thus, if 50,000 new meters could be installed in Colombo City, it could reduce the NRW component by 15-17% within a short period for 1-2 years.

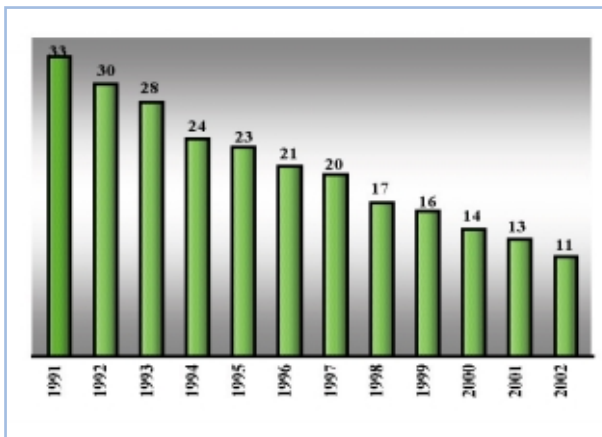
The Sri Lankan Ministry of Finance has estimated that the loss of revenue due to NRW in 2001 was Rs. 2016 million, and if NRW could be eliminated, operation and maintenance costs per m³ of water can be reduced from Rs.20.20 to Rs.13.01. If NRW could be reduced to 30%, the Board could have earned an additional Rs. 4,108 million of revenue in 2002.

An important concern is that even though the towns east and the towns south of Colombo projects are new, NRW component for the towns south is little over one-quarter of the water produced, and for the towns east, NRW is over one-fifth. These are somewhat high losses, especially for newly implemented projects. Given adequate priority, it should be possible to reduce the NRW losses to about 15% within a reasonably period of time.



A water meter set in each household

To enhance institutional sustainability, the Board needs to become increasingly more efficient in terms of staffing. It has already made tremendous progress. For example, in 1991, the Board had 33 staff members per 1000 connections. By 2002, this has been reduced to 11 members per 1000 connections. The goal should be to reduce it further, to about 5 staff members per 1000 connections within the next 5 years.



The changes in the number of NWSDB employees per 1000 water connections.

Capacity building and communication

An important finding of the evaluation is that if the two projects are to deliver the expected outputs on benefits on a long-term basis, capacity building and communication must receive significantly much higher priorities than they are receiving at present. The world of water management is changing very fast, and these changes are likely to accelerate even further during the next two decades. Issues like decentralisation, public and stakeholder participation, private sector involvement, water pricing, water rights, social and environmental considerations, transparent governance, impacts of globalisation on the water sector, increasing emphasis on poverty alleviation and gender, etc., were not issues that were considered seriously earlier. This means that the Board must have staff members who are knowledgeable, experienced and multi-dimensional in character. They should also be forward-looking in nature so that they can anticipate future water-related problems from technical, social, economic, environmental, political and institutional viewpoints, and then recommend and implement cost-effective solutions in a timely manner.

Successful management of the Board in the future will require much deeper and also more broader knowledge, understanding and appreciation of the various issues and problems and their interlinkages. Since the issues and problems in the future are likely to become increasingly more complex and interrelated, the Board will require more knowledgeable and experienced personnel, compared to what has been the norm in recent years. These requirements refer to both technical areas as well as to commercial, financial, administrative and communication areas, which would require significantly added emphasis in the future.



Although NWSDB has capable engineers... (The evaluation team receiving explanations about the facility from NWSDB's engineers.)

Both the two projects have given inadequate emphasis to capacity building. Neither the two projects, nor the Board as a whole will be sustainable in the future unless capacity building is given a much higher priority.

In the future, the Board will be viewed increasingly as the provider of an essential public service, that of water supply and sanitation, rather than as an engineering-oriented institution, as has been the case in the past. Thus, it is essential that the extent, quality and frequency of communication of the Board with the general public and the policy-makers in Sri Lanka should reach a much higher dimension compared to what it is at present.

Customers need to be provided with more information. For example, as noted earlier, currently 30% of the households surveyed perceive that well water is of better quality than tap water, and thus these families are using only well water for drinking. Yet, independent assessment of qualities of tap water and well water carried out during this evaluation established categorically that the perceptions of these households are totally wrong. The tap water is of excellent quality but well water is invariably contaminated, often with faecal coliform. Thus, if the people of the towns east and the towns south of Colombo are to benefit from these two multi-million dollars projects, increased and more frequent communications with the customers must receive priority attention.

Conclusions

Based on the evaluation carried out, following conclusions can be drawn:

1. Technically and financially, both projects can be classified in the excellent category.
2. The social acceptance of the two projects is high. If more appropriate lifeline tariff could be structured, and easier payments for connection

charges could be considered, more poor households are likely to join the system at a much faster rate.

3. The Board is now a very different institution compared to what it was when the projects were planned. It has become significantly more efficient during the past decade. However, it will have to become even more efficient in the future to meet the challenges of the future.
4. Non-revenue water is a critical issue. It needs to be reduced significantly for both the projects evaluated, as well as for other projects under the management of the Board.
5. Capacity building within the Board, and communication with the public and the policy-makers of Sri Lanka should receive priority attention.
6. Sustainability of the projects will require concurrent attention to both hard and soft issues. While hard issues have received appropriate attention, soft issues have been mostly neglected. Both the Board and the donors must give accelerated attention to the soft issues to ensure future sustainability of the projects.



Housing development seen right after the commencement of water supply. (Colombo Southern Towns Water Supply System Extension Project)

3. Lessons Learned

Among the many lessons that could be learnt from the evaluation of the two projects are the following:

1. No information on immediate pre-projects conditions is available at present. This makes it difficult to determine the impacts of the projects on the beneficiaries. For future projects, benchmark surveys should be carried out of pre-project conditions.
2. No mid-term evaluation was carried out for either of the two projects, nor was any regular

monitoring conducted. For major infrastructural development projects, both mid-term evaluation and regular monitoring are essential.

3. Projects were delayed because of problems associated with tendering and procurement processes. These processes need to be further streamlined and improved for future projects.
4. Both projects suffered some delays because of difficulties in coordinating with the Road Development Authority (RDA) in terms of pipe-laying activities. Better coordination between RDA and NWSDB is necessary to ensure timely implementation of construction plans and schedules.
5. The main focus of the two projects was on “hard” construction-oriented issues. “Soft” issues, which could ensure the sustainability of the projects and enhance their impacts, were neglected. Among these neglected soft issues are:
 - ◆ capacity building for the staff who will manage the projects;
 - ◆ determination of lifeline tariffs which is now subsidising the rich and penalising the poor, exactly the reverse of what was expected;
 - ◆ further simplification in the payment of connection charges which will encourage more poor families to connect to the systems;
 - ◆ roles the private sector can play in terms of outsourcing of activities which can improve further the performance efficiency of the Board;
 - ◆ institutional arrangements and strengthening of the Board (since full cost recovery is an objective, consumers of the two projects should not be expected to pay for the inefficiency components of the Board); and
 - ◆ formulation and implementation of a communication strategy with consumers and policy-makers.

Summary of Projects Subject to Evaluation (Produced by JBIC)

Towns East of Colombo Water Supply Project

1) Outline of Loan Agreement

Loan Amount/Loan Disbursed Amount	1,997 million yen / 1,967 million yen
Exchange of Notes/Loan Agreement	January 1990 / March 1990
Terms and Conditions	Interest Rate 2.5%, Repayment Period 30 years,(Grace Period 10 years)
Final Disbursement Date	January 1998

2) Comparison of Original and Actual Scope

Item		Plan	Actual
Project Scope	Water Line	2.4 km	4.5 km
	Water Pipe	111.6 km	299.7 km
	Water pool tank	2 locations	2 locations
	Standpipe	3 locations	3 locations
	Household Water Meter	10,862	10,749
	Public Water Tap	954 locations	Could not be implemented
Implementation Schedule		June 1989 - December 1993	August 1990 - August 1998
Project Cost	Foreign Currency	¥959 million	¥908 million
	Local Currency	¥1,390 million	¥1,588 million
	Total	¥2,349 million	¥2,496 million
	ODA Loan Portion	¥1,997 million	¥1,967 million
	Exchange Rate	1 rupee = ¥3.9	1 rupee = ¥1.9

"Greater Colombo Water Supply System Extension Project" (Southern Urban Areas)

1) Outline of Loan Agreement

Loan Amount/Loan Disbursed Amount	3,726 million yen / 3,353 million yen
Exchange of Notes/ Loan Agreement	June 1993 / August 1993
Terms and Conditions	Interest Rate 2.6%, Repayment Period 30 years, (Grace Period 10 years)
Final Disbursement Date	August 2002

2) Comparison of Original and Actual Scope

Item		Plan	Actual
Project Scope	Water Line	14.8 km	45.4 km
	Water Pool	3 locations	5 locations
	Pump Installation	3 locations	6 locations
	Standpipe	3 locations	3 locations
	Water Pipe	107.2 km	59.7 km
	Others	Consulting Services, etc.	Same as plan
Implementation Schedule		June 1993 - January 1998	February 1994 - May 2002
Project Cost	Foreign Currency	¥3,162 million	¥2,579 million
	Local Currency	¥1,221 million	¥1,826 million
	Total	¥4,383 million	¥4,405 million
	ODA Loan Portion	¥3,726 million	¥3,353 million
	Exchange Rate	1 rupee = ¥2.79	1 rupee = ¥1.5