

## THE LIBERIAN NATIONAL RURAL WATER SUPPLY PROGRAMME:

### Problems and Prospects

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#### INTRODUCTION

In 1974, the Liberian Government launched the first "Well Drilling and Toilet Construction Programme", with assistance from UNDP and UNICEF. This programme was implemented by the Ministry of Internal Affairs. The United State Peace Corps joined the programme in 1975. In 1978, the hand-dug wells and spring catchment components were incorporated to the programme. The programme has since become known as the National Rural Water Programme (NRWP).

In 1980, the programme was transferred from the Ministry of Internal Affairs to the Ministry of Rural Development, in an attempt to bring together the various rural water projects being executed by Government agencies. Currently rural water supply projects involve only 3 - 4 Government agencies, increasing the possibility of an eventual national coordination of rural water supply activities.

During the period 1974 - 1985, over 1,300 waterpoints (spring boxes, hand-dug wells and boreholes), serving about 260,000 rural inhabitants were constructed by both the Government's National Rural Water Programme, NGOs and other private groups. The maintenance of these waterpoints to date has been the responsibility of Government. A centralised maintenance programme has proved, however, to have severe limitations. There is, therefore, a need to work towards implementation of a village-level financed operations and maintenance system.

#### INSTITUTIONAL ARRANGEMENT

The Government of Liberia (GOL) has organised a water policy-making and coordinating body, the National Water Resources and Sanitation Board (NWRSB), it is chaired by the Ministry of Lands, Mines and Energy.

#### ON-GOING PROJECTS - RURAL WATER SUPPLY

##### 1 - SOUTHEASTERN VILLAGE WATER SUPPLY PROJECT (SVWSP)

This project was launched in 1984 to provide 360 deep boreholes, equipped with handpumps. Using two rotary drilling rigs, over 150 wells have been completed to date.

Problems encountered in this area include aggressive groundwater, rusting of the galvenised iron pipes used for rising and the poor performance of the Danish - manufactured KNEBEL hand-pump. An extension of the project is being discussed between the Liberian authorities and the co-financiers DANIDA (Danish International Development Agency).

##### 2 - SOUTHEASTERN RURAL WATER PROJECT - (SRWP)

The target in the initial phase of this project, started in 1986 and co-financed by the EEC, is to dig and drill 51 wells. The project has three local contractors and is supervised by the NRWP of the Ministry of Rural Development. The phase 2 proposal for 75 additional wells has been submitted to the EEC. Phase 1 is awaiting the supply of handpumps for completion.

##### 3 - FOUR COUNTRY RURAL WATER PROJECT

This is the first phase of a GOL/EEC Indicative Aid Programme for Liberia. The target of Phase 1 is to provide 250 wells (150 boreholes and 100 dug wells). The results of this phase will determine the nature of subsequent phases.

#### OPERATION AND MAINTENANCE

The operations and maintenance of the water-points has up till now been carried out by a centralised maintenance scheme, heavily dependent on Government mechanics and donor resources.

There have been problems with the availability of spares, vehicles and other supplies to carry out this maintenance scheme.

A possible solution to support the increased number of water-points estimated to be around 1300, is to decentralise the operation and maintenance and to introduce user charges sufficient to cover expenses and hope thereby to reduce the Government's subsidy to this component.

The NRWP has therefore embarked upon a long-term plan for the establishment of a village-level financed and managed operations and maintenance scheme.

In addition, the NRWP has embarked on a nation-wide pump inventory, which will establish the location, type and status of all existing water-points, as they were not all executed by one agency.

#### HEALTH EDUCATION AND COMMUNITY PARTICIPATION

The role of community health education, community mobilisation and community participation cannot be over-emphasized. In the Liberian context, this multiple soft-ware component constitutes by far the most important aspect of any successful rural water supply undertaking. Reasons for this are that, in Liberia, most rural communities are located near a water source (river, lake, pond, stream etc.), but that rainfall is high for only half of the year. During the 6 months dry season water sources are mainly unreliable so that there is an acute water need in rural areas.

The availability of the traditional water sources further poses a problem: the improved sources (new water-points) appear to be in a stiff competition with the traditional sources in rural areas.

Further, if rural Liberians are expected to pay, in future, for the operations and maintenance of new water-points, it is an absolute necessity that they be educated and made aware of the health benefits of the new water-point. Nothing short of a sustained programme of education and community mobilisation can guarantee a successful rural water supply project.

Based on these observations, concerted efforts to integrate educational component in all rural water schemes are being made. Expatriate and local social workers and health technicians are now developing a plan of action for health education, community involvement and sanitation activities.

#### HANDPUMPS USAGE IN LIBERIA

Rural water supply projects in Liberia have resulted in the installation of number of different handpumps with the following experience:-

##### 1. ABI (Abidjan Industries) - Ivory Coast

This pump, introduced into the NRWS Programme following its inception in 1974, needed modifications to the original design to cater for Liberian groundwater conditions. The subsequent increase in price unfortunately discouraged further purchase and installation.

##### 2. Consallen - United Kingdom

This is the most commonly used pump in Liberia today, but the lack of an appointed local agent means that the availability of spare parts has become an increasing problem.

A limited number of spare parts are obtainable locally but the prices asked are prohibitive. Consequently maintenance of pumps is affected and the incidence of failure increased.

##### 3. Knebel (Denmark)

Installation of this relatively new pump which is really a much modified version of the India MK II commenced in 1984 on a project being implemented through DANIDA funds. To date almost 200 pumps have been installed in boreholes at setting depths in the order of 20 metres. Unfortunately, performance of the pump to date has been far from satisfactory and major modifications will be necessary before the pump is suitable for Liberian conditions.

##### 4. KARDIA (Preusage) - West Germany

The Kardia pump was introduced to Liberia less than one year ago and major defects or problems have yet to materialise. Early field performance is impressive but the high capital cost

as well as low local availability of spare parts may be serious constraints that will restrict the pump's future use.

5. The GOL is procuring over 250 pumps of KARDIA and VERGNET, to be installed in one of our EEC sponsored project areas. Close monitoring of these pumps will be carried out over a two year period, and information on their performance will be useful in arriving at a decision on a standard handpump for Ligeria.

Of interest is the performance of the modified India Mark II (or India Mark III) in DANIDA - financed trials in Sri Lanka. The use of PVC rising replacing gi pipes, along with stainless steel rods, if found satisfactory, will be of great benefit to the Liberian Programme, faced with low ph and high iron in the groundwater.

#### PROJECTIONS AND FINANCIAL IMPLICATIONS

It is anticipated, that the rural and total population will have increased to 1,500,000 and 2,600,000, respectively by 1990 and 2,100,000 and 3,500,000, respectively by 2000 (growth rates at 3% and 4% respectively).

The set target for rural water supply is that by 1990 about 35% of the rural population will have been provided with reasonable access to a safe water supply. On the assumption that each water-point serves an average of 200 persons, approximately 1,600 new water-points will have to be constructed during the next five years. During this period the operation and maintenance system will be redirected toward a village level and revenue collecting system governed by MRD.

The set target for the year 2000 is that same 90% of the rural population will have been supplied: assuming an unchanged number of persons served by each water-point, about 6,900 new water-points will have to be constructed during the 10 years, 1990 to 2000, ie 690 each year. This target assumes that a small percentage of the population will continue to receive water supply points through agencies or organisations other than the National Programme.

By the end of the period, the operation and maintenance system should be wholly decentralised and self-contained at the village level under the overall supervision of MRD.

#### FINANCIAL ASPECTS

##### Construction

The required expenditure for the construction of water-points varies considerably depending on a number of factors, the most important being:-

- i) the type of water-point
- ii) the technology applied
- iii) the location of water-point
- vi) the level of community involvement
- v) access to the site

Using the average unit price given in Table 1, the investment and per capita costs needed for the implementation of the development plans have been estimated and are given in Table 2.

Rural Water Supply Technology	Unit Price for Waterpoints in 1985 - US \$ Per Capita
Spring System	6.62
Hand-dug Well	20.60
Borehole (PERCUSSION)	27.10

Table 1 - Average unit prices for rural water supply systems

	1985 - 1990 (5 years)		1990 - 2000 (10 Years)	
	Annual	Total	Annual	Total
Investment Cost	US \$ 1,441,355	US \$ 7,206,775	US \$ 3,190,875	US \$ 31,908,750

Table 2 - Estimated investment costs for rural water supply programme

Operation and Maintenance

Operation and maintenance, in the past has been financed mainly from Government funds of the general budget for the Rural Water Programme and donors. In the absence of separate recording, operation and maintenance costs presented in Table 3 are based on the provision included in the planned maintenance, health and sanitation activities of Government which at the 1985 US \$ value were 200 US \$ per water-point or 1.0 US \$ per capita.

Operation and Maintenance Costs at 1985 US \$ Value	1985	1990	1995	2000
Nos of Waterpoints	1,000	2,000	6,000	9,000
Operation and Maintenance	200,000	520,000	1,210,000	1,900,000

Table 3 - Estimated operation and maintenance costs

It is recognized that these projections are based on the assumption that support for the water programme will continue at its present level. It is also recognized that the ultimate goal of total user finance may be extremely difficult to achieve. However, this must be the aim if investment in the sector is to continue for no government of a developing or even a developed country can subsidise indefinitely and provide free of charge such an important and vital service.

CONCLUSION

On entering the second half of the Water Decade much remains to be done in Liberia in rural water supply. A planned programme for large-scale coverage will be attempted will be based upon a number of factors, including:

1. An on-going programme of consciousness building and increasing awareness of the enormous benefits of rural water supply among beneficiaries. Education, community organisation and participation will be aimed at throughout the project period.
2. A conscious effort to develop a reliable water-point that is low cost and maintainable by users themselves will be made. Village level operations and maintenance is important for long-term durability of water-points.
3. Standardisation of well designs, especially handpumps is a concern of the Programme. We will keep a tone to the development of a VLOM handpump; the pump above all, which has the advantages of easy maintenance, and eventual manufacture in the African or West African environment. This will hopefully ensure easy access to spares.
4. Encouragement for donor and NGO participation will be pursued, with the long-term objective of developing national institutions manned by Liberians themselves, who can sustain the level of activities of the NRW of Liberia.