

Jamaica Water Sector Policy Paper

Ministry of Water

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1 Introduction

Water is critical to the life, health and economic well being of a nation and has real value as a commodity. Inadequate supplies can and do have adverse social and economic consequences.

There is growing awareness and concern for the issues and problems in the water sector which threaten the nation's health and demand considerable sums for their resolution. These include deterioration and malfunction of municipal supply and sewage treatment infrastructure, management of industrial and toxic wastes and their effect on water resources, rapidly increasing water demands in water deficient areas, and the adverse effects of deforestation.

Jamaica has made significant progress in providing water services to its people. Across the country as a whole the percentage of households with piped water has risen from 61% in 1990 to 66% in 1997. Over the same period the percentage of households relying on water from rivers, springs and ponds has fallen from 5.7% to 3.8%, while the use of pit latrines and other types of sanitation has declined commensurately.

Unfortunately the poorest 20% of the population has not shared in these improvements. One third of the poorest households rely on standpipes for their water, and 30% obtain their water from untreated sources such as rivers. Only 21% of the poorest households have flush toilets.

The average Jamaican household spends 2.1% of its income on water services. This is approximately half of what the average household spend on electricity, and a bit less than half of what the average household spends on telephone services. The poorest 20% of household in Jamaica spend 3.2% of their income on water, while the richest 20% send 1.8% of their income on water.

While Jamaica has sufficient water to meet all demands the resources are unevenly distributed in both time and location. The present shortfall is estimated at 126 MCM/yr. (53 and 73 MCM/yr for the non agricultural and agricultural sectors respectively). Required new water to the year 2015 is estimated at 790 MCM/yr. Of this, 172 is required for non agricultural purposes and 618 for agricultural purposes. Related capital expenditure is estimated at US\$2.2 billion. The non agricultural sector is estimated to require US\$1.3 billion, the agricultural sector US\$0.3 billion and sewerage systems US\$0.6 billion

Future water development and related capital expenditure are driven by policy. Emphasis on water use efficiency and policies to encourage wise water use and conservation practices serves to reduce the amount of water otherwise demanded.

Shifting of national priorities from water resources development to restoration of existing resources and enhancement of water quality serves to reduce the amount of capital otherwise required. Systematic planning as a matter of policy, based on reliable information and a range of plausible alternatives has the potential for containing demand and reducing the amount of capital expenditure needed.

Legislation must be re-examined in light of contemporary water problems with a view to establishing an appropriate regulatory framework to protect consumers, investors and the environment.

This Policy was developed following a comprehensive desk study of the Water Sector, undertaken by a NIBJ team under the World Bank funded Public Sector Modernization Project. In the process of developing the policy, consultations were held with stakeholders in the sector. The Water Sector Policy was developed to complement and be consistent with the National Industrial Policy, the National Land Policy, the Green Paper on Parks and Protected Areas, the National Environmental Protection Plan and the National Policy on Science and Technology. Data on service coverage, quality and costs were drawn from the Jamaica Survey of Living Conditions 1997. Following the completion of the first draft comments were solicited and received from a number of interest groups and agencies. This final draft addresses the concerns and issues raised by those who commented on the earlier draft.

This policy

- outlines the current situation and problems within the water sector
- defines the objectives of the Government to address the issues
- sets out the mode of implementation.

To ensure that the policy is implemented effectively, the Government has mandated the water agencies to prepare a Water Sector Strategy. This Strategy will indicate how the policies are to be implemented, and will ensure an integrated and co-ordinated approach between all the agencies.

2 Water Resources Management

2.1 Current Situation and Problems in Water Resources

Water is essential to national prosperity, environmental sustainability and the quality of life. It is a catalyst to industrial and agricultural development and a vehicle for empowerment and poverty alleviation. However, water is a finite and vulnerable resource and has therefore to be properly managed to ensure its availability. Managing water as an economic good will not only contribute to achieving efficient and equitable use, but encourage conservation and protection of water resources.

The assessment of water resources indicate a reliable yield of 4083 million cubic metres per year (MCM/yr.) Groundwater providing 3418 MCM/yr) and surface water providing 665 MCM/yr.

Present production from both ground and surface water resources total 920 MCM/yr. leaving a balance of 3163 MCM/yr. available for development.

Since April 1996, the Water Resources Authority (WRA) has had responsibility for regulation, control and management of the nation's water resources. In carrying out its mandate, the WRA has completed work in many important areas of water resources management. The main areas of the WRA's work , and examples of major initiatives completed or planned, are listed below:-

i) Integrated Water Resources Planning and Development

The WRA is responsible for planning and implementing the integrated management and development of Jamaica's water resources. In discharging this responsible the WRA has:-

- Developed the Water Resources Development Master Plan which defines the resources, supply and demand at the hydrologic basin level.
- Developed the National Irrigation Development Master Plan with the National Irrigation Commission. This plan defines the irrigable areas and the irrigation water demand.
- Worked with the National Water Commission to prepare "parish plans" setting out time frames for development of resources.

ii) **Resource Monitoring and Assessment**

Ongoing monitoring and assessment of the patterns of resource use, and the response of the resource to use, are critical to the ability to manage and protect these resources.

There are ten hydrological basins in Jamaica. Detailed assessments of seven have been completed. The WRA will assess the remaining basins, and keep the assessments updated. Other tasks related to resource monitoring and assessment include:

- Maintenance of the national hydrologic monitoring network on streams and rivers, groundwater, water quality, withdrawal of water and well construction;
- Research to determine aquifer safe yield and to update the Master Plan.

iii) **Natural Disasters**

The Government will continue to develop proactive and pre-emptive approaches in the field of water related disaster prevention. Community involvement and local government participation will be emphasized.

The WRA is responsible for working with the Office of Disaster Preparedness and Emergency Management (ODPEM) and the National Meteorological Division to reduce and mitigate the impact of natural disasters related to water.

The WRA assesses the likelihood of extreme hydro-meteorological events, such as floods and droughts. It contributes to preparing for, managing and mitigating the effect of such events using flood warning, flood plain mapping and drought plans.

iv) **Protection of Water Resources**

The WRA shall ensure the sustainable use of water resources and the preservation of ecosystems and the aquatic environment through development of:

- vulnerability maps, which show the risk of pollution to aquifers

- source protection zones, to protect water sources and watersheds
- minimum downstream flows, which ensure that rivers contain enough water to sustain ecosystems and preserve their amenity value.

v) **Public Education**

The WRA is responsible for informing and educating the public about Jamaica's water resources. To do this the WRA:

- has established a web site to disseminate information on Jamaica's water resources
- is developing a documentary centre on water resources information.

vi) **Allocation**

The WRA is also responsible for the allocation of water resources. It uses the following criteria in allocating water use rights:

- historical water rights
- availability of water
- effect on **existing** wells and downstream users
- water quality
- economic considerations
- efficiency of use.
- **protection of ecology and ecosystems.**

Despite the improvements brought about by the WRA, there is still much work to be done in the area of water resources management and allocation. Watershed management is often inadequate. Integrated water resources planning is not always achieved in practice, often due to failures in institutional co-ordination. In many cases, water is still being used inefficiently.

2.2 Objectives in Water Resources Management

The allocation and management of water resources will be guided by the following core principles:

- i) Ensure integrated and informed management of the country's water resources. Development of water resources will not be done sectorally.
- ii) Ensure water for public supply will receive priority in the allocation of resources.
- iii) Ensure water is used as efficiently as possible, including promotion of conservation. Where possible the conjunctive use of surface and ground water will be implemented. Demand management must be implemented.
- iv) Ensure implementation of measures to restore and enhance the quality and quantity of usable water and protect the aquifers, watersheds and other sources of water. The following shall be the specific focus of strategies designed for water pollution prevention and control:
 - Maintenance of ecosystem integrity through the protection of aquatic resources from negative impacts caused by development and natural processes
 - Protection of public health against disease vectors and from pathogens
 - Ensuring sustainable water use and ecosystem protection on a long-term basis
 - Implementing the polluter pays principle.

The focus of the policy will also be on developing mechanisms to ensure compliance, including public education, incentives and sanctions.

2.3 Implementation of Objectives in Water Resources Management

2.3.1 Institutional Responsibilities in Water Resources Management

The Government of Jamaica has recently amended the laws to vest in the Water Resources Authority (WRA) responsibility for the regulation, control and management of the water resources. The WRA shall continue to have responsibility for:

- Management of water resources
- Maintenance of a timely updated and comprehensive water resources database
- Raw water quality and monitoring assessments
- Planning and approval for water resources development
- Issuing and enforcing permits for well drilling and water abstraction
- Public education as appropriate.

The Natural Resources Conservation Authority and the Water Resources Authority have responsibility for developing and monitoring standards relating to water quality. Some of these standards have already been promulgated, while others are still being developed.

The Water Resources Authority (WRA) shall own only such assets as are necessary to carry out its regulatory function effectively, and shall in turn be owned 100% by the Government of Jamaica. The WRA will be funded by fees and government subvention.

2.3.2 Allocation Mechanisms

The WRA is responsible for operating a system in which conflicts between water users are resolved in such a manner as to ensure that water resources are used as efficiently and economically as possible. In accordance with its Act, the WRA shall make use of both administrative mechanisms (as at present) and market-based mechanisms in allocating water resources.

The WRA is responsible for the development of appropriate market-based allocation mechanisms. In line with this, it is implementing a system of fees for access to and use of ground and surface water. These fees include the following:-

- A fee to process applications from persons seeking to access the water resources
- An abstraction charge sufficient to recover the agency's cost in performing its water resources functions
- A fee to cover monitoring and other administrative costs of the Authority.

3 Urban water and sewerage

3.1 Current situation and problems in urban water and sewerage

The National Water Commission is responsible for urban water supply throughout the island. It is also the largest provider of sewerage services. Other major sewerage providers include the Urban Development Corporation, and private and public housing developers.

The great majority of urban residents have access to safe piped potable water. In the KMA around 97% of households have piped water, and in other towns 79% of households have this facility (up from 73% in 1996). Urban households without piped water rely predominantly on standpipes. About half the standpipe users in urban areas travel 50 yards or less to fetch water.¹

While coverage is good, reliability of supply to urban households and industrial users is often erratic. As stated in the introduction, sufficient water exists on the island to meet all water demands, but the water resources are not necessarily located close to the major centers of water use. The infrastructure to move the water to the areas where it is needed is inadequate in some parts of the country.

Sewerage services exist in most major urban areas, and are being improved. In the KMA, 92% of households have flush toilets, while in other towns 60% of households have this facility. In the KMA, 60% of households are linked to sewer systems, while in other towns the figure is 11%. The great majority of urban households without flush toilets use pit latrines. While coverage of sewerage services has increased significantly in recent years, it is less extensive than the coverage of water services. Sewage disposal practices are also often inadequate. Significant investments and operational improvements are needed in this area.

The average household in the KMA spends 1.9% of its income on water services, while in other towns the figure is 2.3%. For most households, their expenditure on water is about half their expenditure on electricity.

The roots of Jamaica's problems in the urban water sector are complex and inter-linked. However, some points can be highlighted. Difficulty in mobilising the necessary financial resources is clearly important. In recent years NWC has been incurring losses. Currently, it comes close to covering its operating costs, but does not generate any surplus which could be used to finance investment. The

¹ 'Urban' refers to the Kingston Metropolitan Area and rural town centres

practice has been for the NWC to rely on the Government to finance new infrastructure. However, competing demands on the Government budget mean that this source has not been adequate to provide for the water infrastructure needs of the country.

In spite of numerous interventions by GOJ to make NWC businesslike, the desired results have not been achieved for a number of reasons, including:

- a) absence of timely and adequate tariff adjustments
- b) an increase in the area served by the NWC and hence demand for the service consequent on NWC taking over Parish Council systems
- c) insufficiency of capital to upgrade facilities taken over from Parish Councils.

The NWC's infrastructure is in a generally poor state, and significant investment will be needed to rehabilitate it.

3.2 Objectives in the urban water and sewerage sector

The Government's objectives in the provision of urban water and sewerage are as follows.

3.2.1 Services to be provided

In the area of the services provided to consumers, the Government intends to:

- i. Ensure the availability of minimum necessary quantities of potable water and minimum standards of sanitation service to all:
 - in a cost effective and efficient manner
 - with due regard to health and environmental considerations
 - at a price customers can afford.
- ii. Ensure minimum standards/levels of service for the public supply of potable water. For municipal/urban households and other urban consumers, this will include potable water available 24 hours per day.

- iii. Focus the provision of water and sewerage services on meeting the needs of areas targeted by the National Industrial Policy so as to have the maximum impact on growth and development.
- iv. Provide for expansion of the sewerage network in areas with high population densities having regard to health and environmental considerations.
- v. Ensure improvements in sewage treatment and disposal, to protect the environment.
- vi. Control and reduce the production of industrial effluents, and ensure that such effluents are adequately treated, to avoid contamination of existing water resources.

3.2.2 Efficiency in provision and use

The Government intends to increase the efficiency of provision and consumption of water services. The Government will:

- i. Encourage implementation of measures to ensure conservation by providers and consumers of water. This will include introduction of measures for conservation viz.:
 - reduction of system leaks by water providers
 - adoption by consumers of water saving devices
 - education of consumers and public information.
- ii. Increase the efficiency of NWC operations, including reducing unaccounted for water, and promoting the more efficient use of electricity associated with the delivery of water.
- iii. Encourage optimal utilization of water through multi-purpose uses such as hydro-power generation, recreation and recycling for other purposes.

3.2.3 Enabling environment

To enable the achievement of the above objectives, the Government will promote:

- i. Mobilization of additional sources of funding and investment support, both from the private sector and from external sources
- ii. Introduction of cost recovery mechanisms, so as to ensure that the direct beneficiary pays and that the supply of services can be maintained and expanded
- iii. Effective and efficient operation of an appropriate regulatory framework to protect customers, investors and the environment.

The Government will update the legislative framework by amending existing laws, and where necessary passing new laws, to reflect the policy and facilitate its implementation.

3.3 Implementation of objectives in the urban water sector

3.3.1 Institutional responsibilities in urban water and sewerage

Currently the NWC is responsible for the provision of water and waste-water facilities to urban customers.

The Office of Utilities Regulation (OUR) shall have responsibility for the approval of fees and tariffs based on prescribed/agreed water quality and service quality standards, minimum standards of sewerage services coverage and other appropriate parameters. The OUR and NWC will both be responsible for public education as appropriate.

The OUR shall develop acceptable service standards for urban potable water and waste-water services provided to consumers. The OUR will also develop the appropriate enforcement mechanisms.

The Ministry of Water in consultation with the OUR and other stakeholders will carry out the legislative reforms necessary to give effect to the policy.

In the area of water quality standards, the World Health Organisation guidelines and the Interim Jamaica guidelines will continue to apply, and to be monitored by the Environmental Control Division of the Ministry of Health.

Effluent standards, which set the permissible limits on discharge of treated sewage, have already been developed by the WRA and the NRCA. The NRCA will continue to have responsibility for monitoring and enforcing compliance with these standards.

3.3.2 Financing and cost recovery for urban water and sewerage

Cost recovery mechanisms shall be used to ensure that the direct beneficiary pays and that the supply of service can be maintained. The costs associated with the provision of water, sewerage and sewerage disposal services may be divided into operations and maintenance costs and the cost of financing new infrastructure. A regulatory regime is required to ensure that only efficient cost levels are recovered from consumers.

3.3.2.1 Operating cost recovery

NWC will continue to recover operating costs through tariffs. Where necessary to achieve social objectives, the Government will provide subsidies equal to the tariff, fees and charges otherwise payable by the consumer for “social water” (see section 3.3.3). Recovery of these costs is fundamental to the sustained viability of the entity providing the service.

3.3.2.2 Financing capital costs

Up to now, most finance for expansion of infrastructure has been provided to NWC by grants from the Government. The Government intends the sector to be able to access a wider range of sources of finance in the future. These sources will include:

- Millage (charges levied on consumers in addition to the tariff to fund new projects from which they will benefit)
- Finance provided by the private sector
- Government grants for specific works with high social or environmental value

3.3.2.3 Financing infrastructure for new housing or other developments

For discrete new developments, the developer shall be required to meet all on-site infrastructure costs. The developer should be able to recover these costs through the selling price of the units.

Where off-site infrastructure is undertaken to benefit exclusively a clearly identified new housing development, industrial park or individual residence the capital cost shall be met by the developer. Again, these costs will be recovered in the selling price of the units.

The cost of off-site infrastructure which serves new or existing developments as well as other neighbouring communities shall be recovered via normal tariffs.

Having regard to the administrative implications of applying the above approach to funding and cost recovery with respect to major projects, the areas requiring attention shall be identified and the appropriate funding and method of cost recovery prescribed ahead of time. Private sector involvement in sourcing the necessary funds and carrying out the project may then be solicited.

3.3.2.4 Tariff structure

The amount chargeable for the public supply of water and wastewater services for domestic or industrial use may include, among other things, the following features:

- i. A lifeline rate
- ii. Full cost recovery
- iii. Differential tariffs depending on the areas served

The objective shall be to reflect in the tariff the cost of providing the service, while also taking into account social considerations where appropriate.

3.3.2.5 Tariff regulation

The OUR will be responsible for setting tariffs at a level which allows the NWC to fully recover efficient cost levels (including both capital and operating costs). The NWC will be responsible for increasing the efficiency of its operations, and thus reducing costs to the lowest efficient levels.

Where exceptional circumstances dictate the need for additional funds for systems improvements or rehabilitation, the OUR will take this into account in setting tariffs.

The NWC and the OUR shall implement a public awareness campaign whenever tariffs are adjusted. This will include information on reducing bills through increased water conservation by consumers.

3.3.3 Social water

Potable water should be available to all citizens in such quantity and at such quality as to sustain life, irrespective of the citizen's ability to pay. Minimum

standards of sewerage service, particularly in urban communities where there is no viable alternative, have to be provided for reasons of public health and environmental conditions, irrespective of the citizen's ability to pay. Social Water refers to the provision of these minimal levels of water and sewerage services to persons who cannot afford to pay their full cost. This definition is also expanded to include water supplied to the public at large in circumstances where collecting payment from the user is impractical, for example water provided from hydrants for fire-fighting.

The Government's policy is that minimum standards of water and sanitation services necessary for the sustenance of life and good public health shall be made available to all at a price which they can afford. To implement this policy, the following agencies will work together to define the minimum standards of service for social water:

- National Water Commission
- Ministry of Water
- Ministry of Health
- Office of Utilities Regulation
- Consumer Affairs Commission

This group will recommend the appropriate levels of service necessary for households. They will also consult with the Ministry of Finance to determine the appropriate mix of revenue sources to cover the cost of the recommended levels of social water. The following sources of revenue shall be considered:

- Tariffs and user fees
- Cross-subsidies (this means some customers pay more than the cost of the service provided, so that other customers can receive service at below cost)
- Direct subsidies from the Government of Jamaica Budget.

In quantifying the social water commitment in the Water Sector Strategy, the following principles will be used:

- The determination of eligibility should be based on either a means test or by reference to the national poverty map

- The unit of consideration should be the household
- The desirable minimum quantity of water refers to the well accepted concept of the lifeline quantum. Reference to the international as well as local experience will inform the determination of this figure.

3.3.4 Ownership and private participation in urban water and wastewater

The provision of water is capital intensive. To relieve Government of the full burden of financing the sector, private investment in new infrastructure and private operation of water services will be encouraged. However the Government of Jamaica shall continue to own and/or control (directly or through designated entities such as the NWC), the natural resources and existing infrastructure assets.

Privatization is but a part of strategies of Government to secure economic benefits for Jamaica and not an end in itself. Private participation in the Water and Sewerage Sector is expected to bring improvements in the availability, quality and cost-effectiveness of services being delivered. Private participation arrangements should meet the following criteria.

- i. Terms for privatization that are in the country's best interest.
- ii. Improved economic efficiency in the sector, in both operating performance and the use of capital investment.
- iii. Bringing technical and managerial expertise and new technology into the sector and thus providing productivity improvements.
- iv. Injection of large-scale investment capital into the sector and/or access to private capital markets, thereby reducing public investment
- v. Insulation of the sector from short-term political intervention in utility operations and limitation of opportunities for intervention by powerful interest groups
- vi. Transfer of the risks and responsibilities of ownership from Government to the private sector over the long term.
- vii. Delivery of a reliable and efficient service to communities throughout the island

viii. Making the sector more responsive to consumers' needs and preferences.

The following options for private sector participation will be investigated by the Government:

- Service Contracts
- Management Contracts
- Leases
- Concessions
- Build Own Operate Transfer, Rehabilitate Operate Transfer and similar arrangements.

The specific option to be used in any given instance will depend on the mix of the above objectives the Government wishes to achieve at any given time. In addition the Government will encourage private initiatives to supply areas which currently do not have adequate service.

In order to implement these policies the Ministry of Water will develop a strategy for private participation in the sector. It is intended that the OUR will be responsible for licensing all participants in the industry.

4 Rural water and sanitation

4.1 Current situation and problems in rural water and sanitation

In rural areas, 39% of households have piped water. This is an increase from 33% in 1990, but a decline from the 43% recorded in 1996. A quarter of rural households get water from stand-pipes, and 22% use rain-water tanks. Often these solutions are appropriate. However, the Government is concerned that too many people in rural areas still do not have access to safe drinking water, or must make excessive efforts to fetch water.

Eight percent of rural households obtain water from rivers, streams and ponds. Of those rural households which rely on standpipes, more than half have to travel over 50 yards, and 13% need to go more than 1000 yards. The NWC trucks water to its customers when systems breakdown or supply is intermittent. Parish Councils also truck water, as do private firms.

Sewerage is not generally provided in rural areas, except in small housing developments. In total, 9% of rural households are connected to a sewer system. The percentage of rural households with flush toilets has increased from 28% in 1990 to 31% in 1991. The commonest form of rural sanitation is the pit latrine, used by 68% of rural households. Septic tanks, pit latrines and other types of on-site sanitation can be effective and safe. However if not constructed, used and maintained properly they can pose a threat to health and the quality of aquifers and surface water.

Lower population densities mean that the cost of water provision in rural areas is often higher than in urban areas, while lower incomes in many rural areas make it hard for some customers to meet the full cost of high quality services.

Responsibility for provision of water services in rural areas has been transferred back and forth between the NWC and parish councils over the past two decades. From 1988 to 1993 water provision throughout the island was NWC's responsibility. In 1993 the NWC transferred systems to parish councils for operation. Simple systems without mechanical and electrical equipment were transferred, while systems which are more complex and expensive to operate and maintain were retained by the NWC. The relationship between Parish Councils and the NWC has often been ill-defined and unsatisfactory.

4.2 Objectives in rural water

The Government's objectives for the provision of rural water supply include:

- i. Ensuring that by 2005 all Jamaican households, rural as well as urban, have access to potable water and adequate sanitation:
 - in a cost effective and efficient manner
 - with due regard to health and environmental considerations
 - using approaches which result in costs households can afford.
- ii. Upgrading by the NWC of minor systems being operated by the Parish Councils and subsequent take-over of these upgraded systems by the NWC.
- iii. Encouraging implementation of measures to ensure conservation by providers and consumers of water.
- iv. Increasing the efficiency of operations.
- v. Mobilizing additional sources of funding and investment support, introducing cost recovery mechanisms, and ensuring the smooth operation of an appropriate regulatory framework to protect customers, investors and the environment.

Given the particular circumstances and needs of rural communities, the service standards for rural water and sanitation may vary from those set for urban water and sanitation. The Government will promote the use of appropriate technologies and approaches in rural water provision, and a mix of the following options shall be employed, depending on the remoteness and other special characteristics:

- House connection with running water
- Water shops
- Wayside tanks and loading bays
- Community catchment tanks
- Stand pipes
- Trucking

- Self provision through individual household rain-water tanks and wells
- Other appropriate methods.

4.3 Implementation of objectives in rural water

4.3.1 Institutional responsibilities for rural water

The Ministry of Water and the Ministry of Local Government shall determine formally the responsibilities of the NWC, the Parish Council and other water operators for water supply in each Parish. The Government and Parish Councils shall encourage community participation in the operation and management of community water supply systems such as catchment tanks.

Where the NWC is responsible for service provision, it shall be regulated by the OUR, as it will be for urban provision. The OUR shall develop service standards for such cases, as well as the appropriate enforcement mechanisms and necessary legal reforms.

In cases where the Parish Councils or other operators are responsible for service provision the Council or operator shall be required to publish the level of service they plan to achieve, and to report on its performance against these standards. Potability standards shall be set and enforced by the Ministry of Health. The OUR shall monitor service standards and tariffs and make recommendations for regulation if necessary.

The Ministry of Health, the Ministry of Water, the Ministry of Local Government and the Ministry of Environment and Housing will work together to set standards and targets for rural sanitation, and to ensure that these are achieved.

4.3.2 Financing and cost recovery for rural water

The general principles applied to urban customers will also be applied to rural customers, in cases in which NWC is the provider. However the higher costs and lower incomes in rural areas mean that on average subsidies in rural areas may be higher than in urban areas. Policies on tariff structure and the recovery of costs of infrastructure for new development will also be the same in rural areas as in the urban case.

Where Parish Councils provide water, the Council will be required to recover at least the operating costs of the system through user charges. Capital costs may

be met from internally generated funds, Government grants, or private participation where feasible.

4.3.3 Rural social water

Rural customers rely on social water through sources such as catchment tanks, standpipes and trucking as well as piped water. These sources must provide the minimum standards necessary for the sustenance of life and good public health, at a price which rural customers can afford.

In developing the water sector strategy the following agencies will define the minimum standards of service for rural social water:

- National Water Commission
- Ministry of Water
- Ministry of Local Government
- Ministry of Health
- Office of Utilities Regulation
- Consumer Affairs Commission

This group will recommend the appropriate levels of service necessary for each household. In consultation with the Ministry of Finance, they will determine the appropriate mix of revenue sources to cover the cost of service. These sources may include tariffs and user fees, cross-subsidies and direct subsidies from the Government of Jamaica or Parish Council budget.

4.3.4 Ownership and private participation in the rural water sector

The Government's policy is to encourage private participation in the rural water and sewerage sector, where this is likely to benefit consumers and the country. The benefits which will be sought include improvements in efficiency of operations and investment, technical and managerial expertise, access to new technology and injection of investment capital (thereby reducing public investment). Private participation should also contribute to the insulation of the sector from short-term political intervention, a transfer of the risks and responsibilities of ownership from Government to the private sector, delivery of

a reliable and efficient service to rural communities and increased responsiveness to rural consumers.

As noted above low population densities and low incomes impact negatively on the viability of water and sewerage projects in rural areas. This decreases the likelihood that private sector will be willing to participate. In developing their recommendations on private participation, the Ministry of Water will be required to recommend ways in which rural consumers can benefit from private participation where appropriate. This may include requiring private operators to take responsibility for service provision in an entire area, not just in the urban centers. The Government may provide incentives to encourage private participation which will benefit rural people. Where appropriate, the Government will promote the involvement of co-operatives and small entrepreneurs.

5 Urban drainage

5.1 Current situation and problems in urban drainage

In urban areas, the high proportion of land space covered with hard non-absorbent materials such as asphalt and concrete means that rain water cannot soak into the ground, or be left to run-off into natural water courses. Special systems are needed to collect, channel and dispose of rainwater in urban areas. This is referred to as urban drainage.

Up to now in Jamaica responsibility for provision of urban drainage has been shared in a fairly ill-defined way between the Ministry of Works and Parish Councils. It has been treated largely as an adjunct to road construction. The Water Resources Authority has responsibility for determining drainage needs in its hydrological cycle approach. The Ministry of Works is involved in planning to ensure that drainage is sufficient to prevent flooding, and taking remedial action when flooding occurs.

The Government is aware of a number of problems and missed opportunities in the area of urban drainage. Institutional responsibilities are poorly defined, and co-ordination between institutions is often less than optimal. Provision for drainage, and maintenance of drainage systems, is often inadequate. This results in deterioration of road surfaces and in flooding in some cases. The impact of drainage on the quality of the receiving waters is often over-looked, while at the same time opportunities to re-use drainage water, for example for aquifer re-charge, are seldom considered.

5.2 Objectives and policy in urban drainage

In line with best practice internationally, the Government will ensure that urban drainage is treated as an integral part of the water sector. Key objectives in the sector include:

- improving co-ordination between the various institutions involved in the sector
- improving the quality of urban drainage, both in its initial provision and its maintenance
- maximising efficiency in the provision of urban drainage

- reducing harmful effects on the environment by better planning of drainage discharges, and putting drainage water to beneficial uses where this is feasible and economic.

The Ministry of Water, the Ministry of Works and the Ministry of Local Government will develop recommendations for the achievement of these objectives.

6 Irrigation

6.1 Current situation and problems in irrigation

The provision of water for irrigation makes an important contribution to agricultural production in Jamaica. It is therefore a key element in rural development. However, the Government recognises that the sector suffers from a number of weaknesses. Cost recovery is low, and the sector does not generate funds to finance its own expansion. Operating efficiency is also often low, with high levels of wastage due to lack of funding to effect efficiency improvements such as canal lining and reduction in leakage from pressurised systems. In some cases, farmers use inefficient irrigation techniques. Because of these problems it is often difficult to respond to farmers needs as desired and furthermore there are sometimes harmful environmental effects. Important parts of the country which could benefit from irrigation currently do not have access to this service.

6.2 Objectives

The Government is intent on ensuring that the provision of water for agricultural purposes is done:

- in a cost effective and efficient manner
- in a manner to facilitate sustained social and economic growth and development
- with due regard to health and environmental considerations
- at a price based on economic considerations

The Government will promote:

- achievement of cost-efficiencies
- mobilization of additional sources of funding and investment support from the private sector and external sources
- introduction of cost recovery mechanisms to ensure that the direct beneficiary pays and that the supply of services can be maintained and expanded
- encouragement of farmer participation in the management and distribution of irrigation water

- introduction of conservation measures including measures to improve irrigation efficiencies and reduce system losses
- expansion of irrigation facilities on a phased basis to agricultural belts across the country with particular emphasis on the arid but highly productive southern agricultural parishes
- development of ways and means to facilitate the needs of hillside small farmers.

6.3 Implementation of objectives in irrigation

6.3.1 Institutional responsibilities for irrigation

The National Irrigation Commission (NIC) is currently responsible for the operation of irrigation systems.

The Government has decided that its objectives in the sector can best be achieved by delegating responsibility for irrigation systems to Water Users Associations (WUA) composed of the farmers who benefit from the system.

There will therefore be a transition period in which the NIC encourages the formation of WUAs for irrigation systems around the country, and progressively delegates responsibility for operating and maintaining the systems to the WUAs. During this transition period the NIC will provide technical support and other forms of support to the WUAs, and ensure that they function effectively. During the transition the NIC will also continue to fully operate systems which have not yet been delegated to WUAs.

The longer term objective is that the NIC's role will become one of planning, regulating, monitoring and evaluating the irrigation sub-sector. The question of the form of regulation appropriate for irrigation systems will be addressed. The Government has mandated the Ministry of Water (including the NIC), the Ministry of Agriculture and the OUR to consider and report with recommendations on this issue.

6.3.2 Financing and cost recovery for irrigation systems

To ensure that the irrigation systems are financially viable, the Government has decided that the operations and maintenance costs of existing systems should be met from charges paid by the users of those systems. This policy objective will be phased in within 5 years.

In the case of new systems to be constructed under the National Irrigation Development Plan, users will be required to pay a reasonable proportion of the capital costs also. The proportion will depend on the ability of the users to pay, and will be decided on a case by case basis.

6.3.3 Subsidies in irrigation

Water for irrigation has to be provided to farmers from time to time at prices below cost to ensure continued operation of farming activity, having regard to wider economic consequences.

In developing the water sector strategy the following agencies will determine the circumstances under which subsidised irrigation water shall be provided to farmers and define the minimum standards of service for irrigation water in such cases:

- Ministry of Water
- Ministry of Agriculture
- National Irrigation Commission
- Office of Utilities Regulation
- Sector stakeholder groups

In consultation with the Ministry of Finance, they will determine the appropriate mix of revenue sources to cover the cost.

6.3.4 Ownership and private participation in irrigation

The current practice of vesting assets with the NIC will continue. Private sector and co-operative involvement in public irrigation will in due course come about through the formation of Water Users' Associations (WUA's) as legal entities (e.g. co-operatives or limited liability companies) where this is deemed the best model for any particular system. Farmers will be members and shareholders who will have the power to govern these organisations. Responsibility for local management, water distribution, monitoring and system maintenance for these systems will be assumed by those WUA's which have attained legal status. There will be provision to facilitate continual accession of WUA's to independent status as they prove themselves capable of assuming full responsibility. Other forms of private involvement in irrigation will also be encouraged.

WUA's will be pivotal to a process that will ensure a greater rate of cost recovery, lessen the burden on the central government and promote the sustainability of irrigated agriculture through decentralised self-governance as far as is possible and practicable.