
CHAPTER TWELVE

VALUING WATER

12.1 Situation Analysis

Uganda's water resources are a key strategic resource, vital for sustaining life, promoting development and maintaining the environment. Access to clean and safe water and improved sanitation facilities and practices are pre-requisites to a health population and therefore have a direct impact on the quality of life and productivity of the population. Besides domestic water supply, water is also vital for: Livestock Water Supply, Industrial Water Supply, Hydropower generation, Agriculture, Marine Transport, Fisheries, Waste Discharge, Tourism, and Environmental Conservation. Water, therefore, significantly contributes to the national socio-economic development and thus poverty eradication.

Agriculture has continued to be a source of livelihood for the majority of the people in Uganda. Similarly, the generation of electricity, which also relies heavily on the availability of water, provides 25% of the energy supply for Uganda. The electricity sub-sector contributes about 1% to formal sector employment in the country. The industrial sector, another major consumer of bulk water contributes about 25% to formal sector employment. Water is a major means of inland transport in Uganda.

Water has traditionally been considered as a public and social good, which is available in unlimited quantities and therefore should be available to everyone free of charge! This has led to misuse and pollution of water resources making it increasingly scarce.

Government budgetary allocations to the water sector have over the past years been inadequate (0.3% of GDP). The current investment in the sector has been made possible by the significant external financing from Uganda's cooperating partners. Donor financing as a percentage of the total capital expenditure during the period 1991-1995 was in the range 75% - 91%.

Furthermore, there has been very limited private sector involvement in the management and development of water resources in Uganda. The public good nature of the water resource discourages a private entity to invest in the preservation or improvement of the resource since it is difficult to recover costs from users.

In order to address the above issues, the Government prepared a National Water Action Plan (WAP) which embraced most of the Rio (UNCED, 1992) principles, the most important one of which being the recognition of water as an economic good with an economic value and that should be taken into account while allocating it among competing uses. The WAP principles were later embedded in the Water Statute, 1995, and the National Water Policy, 1999. These developments, coupled with the extensive sensitization of the public on the value of water, have started yielding results as the general public has started recognizing water as a precious resource, which ought to be managed and used responsibly.

12.2 Economic Value of Water

The National Water Policy 1999 provides that water is a socio-economic good and its allocation should be based on the social and economic values. Recognition of the different values of water helps in conserving the water resource; reducing wastage and loss; shifting consumption to high value uses and balancing scarce water resources with increasing demands. Uganda has developed allocation strategies for water among competing uses based on a comprehensive assessment of the economic, social and environmental impact of each intended use.

Sound economic principles require that sectors or individual water users be charged for water at a rate equal to the full economic cost of supplying the water. The full economic cost of water is a summation of the full supply cost, opportunity cost, and economic and environmental externalities.

Full supply costs refers to operation and maintenance costs and capital costs. The operations and maintenance costs include purchased raw water, electricity for pumping, labor, repair materials, input costs for managing and operating storage, distribution and treatment plants. Capital charges refer to capital consumption i.e. depreciation charges and interest costs associated with reservoirs, treatment plants, conveyance and distribution systems.

In Uganda, water is provided to users at a price lower than the marginal or even average supply cost, and hence there is no incentive for conservation and waste reduction. This leads to a paradoxical situation where the water resource is already under stress and yet the subsidy encourages users to waste it.

Water pricing policies are important instruments to achieve national and regional goals. Users should pay a fair price for water in order to reflect its value to society as a scarce resource. With tariffs moving towards full cost recovery (average cost pricing), high-value users ought to be able to obtain the water they need at an economical price.

12.2.1 Tariff Levels and Pricing Policy

The current tariff structure is based on affordability and uniformity across the country while ensuring cost recovery. The current tariffs are not adequate for system expansion, but are in most cases able to cover operation and maintenance costs. Major investments in system improvement and extension are currently financed separately from sources outside the tariffs (grants from government and donors), and this is likely to continue for some time until the towns become more viable. Full cost recovery (operation and maintenance, depreciation, and investment) would require a significant increase in tariffs. The current (2004) water tariffs are shown in **Table 12.1**.

Table 12.1: Water Tariffs by Category of User

<i>Category</i>	<i>NWSC, 2003/4 UShs./M³</i>	<i>Urban Water Authorities, 2004 UShs./M³</i>
<i>Public standpipes (bulk)</i>	449	1,000
<i>Public standpipes (jerrycan)</i>	25 – 50	25 – 50
<i>Domestic</i>	693	1,000
<i>Government and Institutional</i>	854	1,000
<i>Commercial and Industrial</i>	1,187 – 1,324	1,000
<i>Weighted average – Uganda</i>		1,037

Source: NWSC (2003b) and MWLE (2003c)

The NWSC uses a rising block tariff structure for commercial consumers, to discourage waste of water. The NWSC approach to management allows for cross-subsidies among towns.

The NWSC applies an additional 75 – 100% of the applicable tariff in case of a sewerage connection. The tariff is higher for the commercial consumers and lower for the domestic consumers, the lowest being for bulk sale at stand taps. However the poorer users of stand taps generally end up paying more for the water collected in *Jerrycans*¹ due to the costs of operating a stand tap.

12.3 Social Value of Water

The Constitution of the Republic of Uganda 1995 provides that every Ugandan is entitled to clean and safe water. The National Water Policy and Water Statute also re-iterate that in allocating water for different uses, first priority should be given to the provision of water of adequate quantity and quality to meet domestic needs. Allocation for other needs (irrigation, hydropower, livestock, industrial) should be done considering the economic, social and environmental value of water.

Despite Government's recognition of the economic value of water, for reasons of equity, public health and amenity, the government continues to provide "free" basic water supply, especially in rural areas, and peri-urban slum areas which are predominantly inhabited by the poorest communities.

¹ Portable plastic containers used for collection of water

12.4 Cultural Value of Water

There are many cultural norms associated with different water bodies in Uganda. In many communities in Uganda, Waterfalls, hot springs and rapids are associated with traditional cultural heritages. An example is Bujagali Falls (see **Figure 12.1** below), which is considered to be an ancestral divine place for Basoga (one of the biggest tribes in Uganda). The site is believed to possess which the believers claim have special healing powers for many common diseases. Though the site is also ideal for hydropower development, the close cultural attachment to the site has made it very difficult for the site to be developed due to the outrageous demands put on the would be developers by the cultural custodians of the site. Hot springs located in the mountainous areas of western and eastern Uganda are also considered to be special divine sites by the local communities who visit the sites regularly for supernatural cleansing, healing, and blessings from the ancestral spirits associated with these sites.

12.5 Specific Socio-economic Values of Water

12.5.1 Water for Agriculture and Food Security

Water is a key factor in the production of adequate food for Uganda. Water resources are a prime factor in irrigation, livestock watering, aquaculture, fisheries, food processing and other agro-industry, and fishing industries, which provides opportunities for employment to a large proportion of the rural and urban populations. The provision of water for water supply and agriculture to the poor segments of the society is a development imperative, both for reasons of social equity as well as food security and economic development.

A detailed description of the role of water in ensuring food security is given in **Chapter 7**.

12.5.2 Water for Hydropower Production

Hydropower is the major source of electrical power in Uganda. With a total estimated potential of 2,000 MW, it is the most abundant and cheapest electrical power source in the country. Uganda has a comparative advantage in hydropower resources in the region. Most of Uganda's hydropower potential is concentrated along the White Nile. In addition, there are also several small rivers in different parts of the country, with a potential for mini and micro hydropower development.

Uganda relies solely on hydropower for energy production needed for all socio-economic activities. The current installed capacity of only 260MW is grossly inadequate to meet the national demands. The current low level of economic development in Uganda is partly attributed to the inadequate power, which cannot support large-scale manufacturing industries and agro-processing factories.

A detailed description of the role of water in energy production in Uganda is given in **Chapter 8**.

Figure 12.1 – Bujagali Falls



12.5.3 Water for Domestic Consumption

Access to clean and safe water and improved sanitation facilities and practices leads to improved health and are essential investments in human capital and therefore have a direct and immediate impact on the quality of life, thus contributing to long-term socio- economic development of the country and eventual elimination of poverty.

The burden of water collection falls mainly on women and children who are the most vulnerable members of society. Owing to the long distances they travel to collect water, this significantly reduces their productive time and subsequent contribution to the economic development of the country.

Investments in water supply and sanitation services has direct socio-economic impacts by relieving the burden on women, improved hygienic conditions through better access to

water and sanitation services, and reduced water pollution through the construction of wastewater treatment plants and other mitigation measures. Increasing access to safe water is equally vital to the health and welfare of the population.

The current safe water supply coverage (58% in rural areas and 60% in urban areas) is still low and there is a need for a concerted effort by the government to invest the necessary resources to ensure that all Ugandans have access to safe water supply.

A detailed description of water for domestic consumption is given in **Chapters 4 and 5**.

12.5.4 Environmental Water Requirements

With the growing awareness of environmental issues in Uganda, the natural environment is slowly being considered a legitimate water user. It is, therefore, a requirement under the current Environment and Water legislation that any planned water use takes into consideration water requirements for the environment within its vicinity. This is being enforced through the mandatory Environment Impact Assessment conducted for all water related projects, which ensures that all environmental concerns are addressed during the planning and implementation of the projects.

In order to ensure the integrity of the environment, the Government has also introduced water abstraction and waste discharge permits, which are used to regulate water abstraction and discharge of waste into water bodies. These permits have proved to be very effective regulatory instruments whose use has greatly enhanced environmental conservation and management in Uganda.

POLLUTER PAYS PRINCIPLE

Under the current Environmental law, Government has instituted the 'Polluter Pays' principle as a way of controlling pollution of water bodies. As part of implementation of this principle, a comprehensive regulatory mechanism has been established under which the Government levies a pollution charge on all major polluters (especially point source pollution e.g. industries). This initiative has been very successful in encouraging potential polluters to invest in efficient onsite treatment systems to reduce their polluting discharges and thus minimize their pollution charges. Enforcement of this principle is done through issuance of wastewater discharge permits. The pollution charges are levied on specified pollutant discharges on the basis of the BOD loading and concentration of the effluent, with the charge reflecting the likely environmental damage attributed to the pollutants in the effluent. The pollution charges, though not high, reflect the environmental costs of pollution and have proved to be a useful source of funds for environmental restoration initiatives.

Table 12.2 below shows the pollution charges levied in Uganda as provided for in the Wastewater Discharge Regulations, 1998.

Table 12.2 – Pollution Charges (Waste Discharge Fees)

<i>BOD Load 10³ kg Oxygen/year</i>	<i>Unit Charge (U.Shs. Per Kg Oxygen)</i>	<i>Annual Charge U.Shs.</i>
<i>100 and less</i>	Not charged	Not charged
<i>100-400</i>	2.0	500,000
<i>400-600</i>	2.0	1,000,000
<i>600-1800</i>	2.1	2,500,000
<i>1800-3000</i>	2.1	5,000,000
<i>3000-3800</i>	2.2	7,500,000
<i>3800-5200</i>	2.2	10,000,000
<i>5200 and above</i>	2.5	13,000,000

A detailed description of the role of water in environmental conservation is given in Chapter 6.

12.5.5 Water for Industrial Production

Water plays a very crucial role in the mining and manufacturing sectors. The sectors are among the major consumers of bulk water, which is used as an intermediate input in their production processes.

The major industries in Uganda include: Breweries, Soft Drinks, Soap, Textile, Steel Rolling, Dairy processing, Fish processing, Sugar, Tea, Tobacco, Paper, Cooking oil. In addition, there are a few mining activities being carried out in the country i.e. Cement, Lime, Cobalt, Gold, Copper (mining ceased a few years ago), Salt, Phosphates.

In general, water costs are a small fraction of the total production costs in industries (the cost of water is very low when compared to other inputs like raw materials, technology). The primary decisions on technology and output determine the amount of water required per unit of output in the specific industrial production process. Therefore, the importance of water lies mainly in the role of water-reuse in industrial processes. Thus the internal cost of water re-circulation is often used to estimate the value of water in industry. Another less direct measure is by using the alternate cost framework of providing the same water quality through pre-treatment of effluent; this cost is assumed to be the value of water for that industry.

12.5.6 Recreation and tourism

Tourism is an important sector in Uganda as it provides jobs and foreign exchange earnings to the country. There are a number of water related tourist attraction e.g. White water rafting along the Nile in Jinja, Sport fishing on the major lakes, and Boat riding, Swimming and Beach Volleyball along Lake Victoria.

In addition, wildlife in the Game parks and reserves thrive on the fresh water resources in these areas.

12.6 Economic Value of Wetlands

Wetlands cover about 30,000km², or 13% of the country and play an important role in the socio-economic development in Uganda. Wetlands have intrinsic attributes, perform functions, and produce goods and services. Wetlands represent considerable ecological, social and economic value. Wetlands maintain the water table, control floods, provide habitat for animals and plants.

Human activities based on natural wetland resources generate a wide range of products that are consumed both locally and internationally. Valuation is being used to give a more complete picture of the economic desirability and long-term viability of wetland reclamation. For example, according to an evaluation carried out recently estimated the economic value of the services provided by Nakivubo wetland in Kampala to be US\$1.7million a year. The most of valuable service attributed to this wetland is wastewater treatment and purification. In addition approximately US\$100,000 is estimated to accrue from wetland goods and products through crop cultivation, papyrus harvesting, brick making and fish farming. In rural areas each household engaged in papyrus harvesting is estimated to be deriving as much as US\$200 a year from their wetland activities.

Approximately 5 million people in rural areas in Uganda depend directly on wetlands for their water supply. The economic value of this service alone has been estimated to be US\$25million per year. Wetlands contribute to water supply not only to neighboring communities, but also to most people through groundwater recharge, water storage and water purification. Wetlands form the backbone of the entire drainage system in Uganda. Most of Uganda's surface water is absorbed and stored in wetlands. The wetlands function as fresh water reservoirs that slowly release the water, either underground to replenish aquifers, or laterally towards the major drainage basins. The slow release of water increases water availability during the dry season for domestic use, edge cultivation and livestock watering, and keeps boreholes, shallow wells, and springs functioning. In addition wetlands also distribute water widely throughout much of Uganda thus bringing water close to the rural communities.

Wetlands do not only provide a continuous, reliable supply of water to a large population, they also ensure that it is relatively clean, by trapping silt and pollutants, thereby making an important contribution to public health and reduction in health costs.

Table 12.3 shows some of the major wetland values derived from different attributes, functions, goods and services.

Table 12.3 – Typical Wetland Values in Uganda

<i>Direct Values</i>	<i>Indirect Values</i>	<i>Option Values</i>	<i>Non-use values</i>
Production and consumption goods and services such as: ✓ Fish ✓ Fuel wood ✓ Building poles ✓ Sand, gravel and clay ✓ Thatch ✓ Water ✓ Wild foods ✓ Medicines ✓ Agriculture/cultivation ✓ Pasture/grazing ✓ Transport ✓ Recreation	Ecosystems functions and services such as: ✓ Water quality ✓ Water flow ✓ Water storage ✓ Water purification ✓ Water recharge ✓ Flood control ✓ Storm protection ✓ Nutrient retention ✓ Micro-climate regulation ✓ Shore stabilization	Premium placed on possible future uses and applications: ✓ Pharmaceutical ✓ Agricultural ✓ Industrial ✓ Leisure ✓ Water use	In terms of: ✓ Cultural values ✓ Aesthetic values ✓ Heritage values ✓ Bequest value ✓ Existence value

Source: Economic Tools for Valuing Wetlands, IUCN, 1999

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