Chapter 12:

Valuing Water

The concepts underlying the intrinsic value of water are still debatable depending on the two indispensable attributes of water as an economic good and for its social value. More often than not the value of water is tied to the economic and financial investments put into its development and management and hence leads to cost recovery considerations. Water was involved in one of the most famous intellectual conundrums in the history of economic thought: the water-diamond paradox. This problem was resolved in the eighteenth century with the concept of a distinction between value in-use and value in-exchange. Although its price is low, water has an enormous value in-use to humans since it is a necessity to survive, while diamonds have a high value in-exchange (Borgoyary M., 2002).

Historically, water was available in ample supply and therefore was treated as a free good, and continued to remain so even with increases in population and economic growth. As a consequence, many rivers and groundwater sources have become polluted and water is now a scarce resource. Water has been traditionally provided to meet demand. However, it is becoming prohibitively expensive to resort to large-scale infrastructural solutions for providing water to meet ever-increasing demands.

Effective water resource management requires that water be treated as an economic good. The 1992 Dublin Statement [United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in June 1992] states that, "water has an economic value in all its competing uses and should be recognized as an economic good". There is still a debate on the theoretical and operational implications of this concept and the economic impact on the poor. Price signals have successfully helped in achieving the social and economic equilibrium for most goods. However, in the case of water resources, this is completely lacking since water is perceived as too vital and basic a commodity to be left to market forces and also because there is no conventional market for water.

In Algeria for example, until the mid-1980s, the cost of drinking water for users was well below the cost of supply. However, after 1984, the tariff was redesigned to increase cost recovery for water systems. In terms of irrigation prices, the fixed charge (per litre per second per hectare) decreased from $ US 3040 in 1985, to $ US 48 in 1995. In terms of volumetric charges, it remained the same, at $ US 0.02-0.03 in 1995. In Botswana, in 1994/1995, 44 per cent of the total operational and maintenance costs of water supply were recovered, compared to 33 per cent recovery in 1988/1989. These examples help to show that in the absence of working markets for water and in the presence of growing conflicts over water use, there is a pressing need to understand the underlying

economics of water demand and value in various economic sectors, especially in the context of developing countries (Borgoyary M., 2002).

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The Ministerial Declaration of the 2nd World Water Summit at The Hague, (2000)

"Valuing water: To manage water in a way that reflects its economic, social, environmental and cultural values for all its uses, and to move towards pricing water services to reflect the cost of their provision. This approach should take account of the need for equity and the basic needs of the poor and the vulnerable."

Water as an economic good

The last 10 years of the twentieth century have seen an increasing emphasis on the economic aspects of water resources use and development. The New Delhi Statement emphasized the importance of sound financial practices with respect to drinking water supply and sanitation. The Dublin Statement further developed this point. The last of the four Dublin Principles reads: "Water has an economic value in all its competing uses and should be recognized as an economic good."

Internationally, this Principle is widely accepted. But what it implies for the price of water is not at all clear. Already, in Dublin, there was considerable confusion on what this principle meant. Considering water as an economic good relates to making the right choices about the utilization of water in the broadest socio-economic context. This is something completely different from water pricing. Water pricing has to do with cost recovery and demand management. The only relation with economics is that the price charged should not be higher than the economic value; but that is all. That water is an economic good has everything to do with setting priorities in view of the public interest. Economics is about making the right choices, and not about setting the appropriate price for water, as believed in certain circles (Borgoyary M., 2002).

The Economic Value of Water

"Whoever has some water available has the choice between using that water or offering it to the highest bidder among alternative users. If he decides to use the water himself for whatever activity he is engaged in (household, agriculture, industry, or using the water as a sink for residuals from production or consumption activities), he abstains from an income he could have earned by selling this water to someone else in the community or downstream. This means that the user decides that the value of the water to him is higher than the income foregone. By not selling the water, he abstains from an income opportunity; thus the concept opportunity income or opportunity cost."

(Borgoyary M., 2002)

This misinterpretation of "water as an economic good" led to a serious misunderstanding in the debate, both at the Dublin Conference and at the Earth Summit in Rio de Janeiro. Some people feared that the adoption of this Principle would lead to economic pricing of water, which would damage the interests of the poor and make irrigated agriculture virtually unfeasible. As a result, a number of disclaimers were added to the 4th Principle, stating that water is also a "social" good

and that it should be affordable to the poor.

What "water as an economic good" implies is that decisions on the optimum use of water and the allocation to different potential uses should be taken on the basis of socio-economic trade-off analysis that is independent of the ability to pay. If a society values environmental, cultural, sustainable and social considerations sufficiently, then it will be given a high economic importance, even if there is a low ability to pay. In other words, considering water as an economic good implies that governments subsidize those uses of water that have a high value but a low ability to pay. On the other hand, where an economic interest has a direct ability to pay (e.g., industry, urban households, commerce), water should preferably be priced at its economic value, which may exceed the production cost of the water for demand management purposes. The revenue thus generated can be used to subsidize interests, which have less ability to pay.

Charging the economic value of water is, however, a complex issue. In the case of urban water supply, the corporation supplying the water is normally a monopolist. The role of government should thus be to check the levies, and to ensure that water is supplied to the poorer neighborhoods. In the case of irrigation, charging economic prices presupposes the possibility of irrigators to refrain from using "their" water and "sell" it to a fellow farmer instead. Frequently, the water laws do not allow such a transaction; especially those water laws that are based on the principle of "beneficial use". Water users will only be willing to pay more for water, and invest in water-saving technologies, if they perceive their rights to water as sufficiently secure, and if supplies are sufficiently reliable. Concepts such as "cost recovery," "user pays," "asset transfer," thus have their limitations, despite their popularity among many donors. Would it work in situations where the physical infrastructure is dilapidated, user ability to pay is severely constrained by macro-economic factors, market concepts and institutions are absent or in their infancy, water law and property rights are inadequately defined, capability in both management and regulation is limited and the social and environmental risks of getting it wrong are considerable?

The call for price reforms

To argue for water to be treated as an economic good does not necessarily imply that a market price must be paid for it. What it means is that water is a scarce and valuable resource that should not be wasted, and that proper pricing (valuation) will ensure efficient utilization. The following offers a useful framework of the economic rationale for implementing water pricing reforms (or water valuation):

Relative value of water: Like other goods, water also has a value that any consumer will be willing to pay as long as the marginal benefit of consumption exceeds the costs. Water must not be assumed to have zero value, an idea that persists, particularly in Africa.
Cost of water: While the value of water depends on its use, the cost of water is usually associated

with the infrastructure of storing and delivering it; the user cost. However, one important cost component that is often ignored due to the difficulty of measuring it is the "opportunity cost" of having the water in its present use. As water becomes scarce (both in terms of quantity and quality), its opportunity cost increases and becomes more important to consider.

Balancing water values and costs: All over the world, users pay only a part of the full economic cost of water. For example, in most industrialized countries and in some developing countries, only the full average financial costs are recovered from urban water users, while for the majority of urban water users in developing countries, cost recovery is even lower.

In a nutshell, treating water as an economic good or ensuring proper valuation of it will provide powerful decision and management tools. At a macro level it will ensure efficient utilization of water both at the user level and at the project level, thereby enabling sustainable water resource management. In specific terms, treating water as an economic good will help to (Borgoyary M., 2002):

- Measure the costs and benefits from water and sanitation investments and policies;
- Assess the demand for water and wastewater services and evaluate their relationship to price, income, and other variables;
- Inform decisions regarding the use and targeting of public subsidies, and how to reform tariffs and improve utility finances;
- Evaluate sanitation alternatives and their tradeoffs;
- Assess the costs and benefits of water demand management options, including pricing, leakage reduction, and metering;
- Evaluate the desirability and feasibility of intra- and inter-sectoral water reallocation;
- Assess the efficiency of various modes of service provision (for example, public versus private, centralized versus decentralized);
- Design regulatory and legal frameworks for public sector participation; and
- Evaluate the impacts of projects or reform on the different sectors and stakeholders, and devise ways to strengthen institutional frameworks.

To treat water as an economic good does not necessarily lower its social or ecological importance, but rather complements the social and environmental perspectives.

Methods of valuation

The total economic value of water can be broadly defined as the maximum amount the user would be willing to pay for the use of water. People obtain many types of value and benefits from water that can generally be classified into two categories (Borgoyary M., 2002):

(a) **Use values:**

- Commodity benefits (for drinking, cooking, sanitation, and leading to productive activities on farms and industries); and
- Waste assimilation benefits (to carry away and dilute waste, and aid in processing waste into less undesirable forms).

(b) **Non-use values:**

- Public and private aesthetic and recreational benefits;
- Species and ecosystem preservation; and
- Social and cultural values.

The non-use value is difficult to measure, but can be subdivided into existence value (value from knowledge of continued existence) and bequest value (the willingness to pay in order to ensure that next generations will be able to use the resource in the future).

Valuation techniques for different water uses

There are two broad approaches to valuation of natural resources: the direct valuation and indirect valuation approaches. The direct approach uses methods that attempt to elicit preferences directly with the use of survey and experimental techniques such as the contingent valuation and contingent ranking techniques. In the indirect technique approach, values are based on actual, observed market-based information. Different indirect methods are used to measure the value of water on a sector basis (Borgoyary M., 2002):

- Value of water in the municipal sector. The demand for water in the municipal sector can be categorized as residential, public, and other uses. Given the heterogeneity of demand for water in this sector, the marginal value of water in the municipal sector depends upon how much of it is already available and can range anywhere from negligible to infinite, depending on the extremes of abundance and scarcity. It has been observed that for urban utilities in developing countries, the price of water only reflects the average financial costs (capital, operation and maintenance costs), while for urban utilities in developed countries the price of water reflects only the average financial costs with capital costs computed in replacement costs.
- Value of irrigated water. For measuring the value of irrigated water, crop-water production function analyses and farm crop budget analyses are used. In the former, application of all other inputs in agriculture are assumed to be constant, and the marginal value of each volume of water used is the marginal price times the price of the crop. This method is based on the assumption that the application of different amounts of water incurs the same labour, fertilizer, and other input costs. In the farm crop budget analyses, the total crop revenue less the non-water input costs is considered to be the maximum amount the farmer could pay for water and still cover costs of production. It thus reflects the on-site value of water.

- Value of water used in industry. Given that water costs are a small fraction of the total costs of industries in general (the cost of water is very low when compared to other inputs like raw materials, technology), water use is of secondary importance to industry for profit maximization. The primary decisions on technology and output determine the amount of water demand 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.
- Recreational and aesthetic value of water. For estimating the recreational and aesthetic value of water, the travel cost approach is used. Value is inferred from the value that users place on a recreational experience from their travel behaviour. It is assumed that the average cost that the person incurs to visit a waterfall, a lake, or a river is the minimum amount that the person is willing to pay for the recreational and the aesthetic value of water.

Direct methods of water valuation – some African examples

Aside from the indirect approaches mentioned above, the direct approach of asking people how much they are willing to pay for a resource (known as the contingent valuation method (CVM)) is also used to estimate the value of water. This method can be used to estimate the value of water used for agriculture, municipalities, industries, or even for recreation and aesthetic value. Questionnaires and surveys are conducted to elicit rank or value. In the contingent valuation method, people are directly asked to state or reveal what they are willing to pay (or accept as compensation) for good quality water, assured supply of water for irrigation, and so on. The reliability of the CVM method depends on the design of the questionnaire. For example, in order to come up with a realistic Willingness To Pay (WTP), estimates of the hypothetical change in water supply should be clearly defined and the rules of the hypothetical market games should also be clearly understood.

The World Bank's programme on the economic valuation of water supply has adopted two approaches to deriving economic values: dichotomous and contingent valuation. With the dichotomous choice one can observe how people choose between alternative means of water supply evolving overtime (Borgoyary M., 2002).

Kenya

There have been several other applications of CVM to water resource management issues in developing countries. In Ukundu, Kenya, villagers can choose between water from vendors who visit the home, water from kiosks in the villages, and water from the well. In terms of collection

time, relative to use of the well, house delivery saves the most time and collecting from kiosks, the least amount of time. In terms of expenditure, household vending costs the most, followed by kiosk water, while well water is the cheapest. The Ukundu study shows that users of vendors and kiosks were revealing high WTP for time saving, of the order of eight per cent of income.

Ghana

A contingent valuation study of household demand for improved sanitation in Kumasi, Ghana in 1993 estimated that on average households without water connection were willing to pay $ US 1.52 for a water connection and $ US 2.57 per month for both a water connection and a toilet. Households with private water connections but without a toilet were willing to pay seven per cent more for a toilet than for the Kumasi ventilated improved pit latrine (KVIP). Households using public latrines were willing to pay about 37 per cent more for a KVIP than households with bucket latrines. In another study (1989), the water quality of Barbados and Uruguay was estimated using the contingent valuation method. It is clear from the above discussions that water as a scarce resource has been undervalued and overexploited especially in developing countries. Practical implementation of the Dublin Statement (1992) implies proper valuation of water so as to reflect the actual value of this scarce resource and thus guide the policies enabling a sustainable growth pattern.

Future directions for sustainable water use in developing countries

The aim of achieving economic development and growth has led to overuse and misallocation of scarce resources, leading to escalating environmental costs. The increasing gap in demand and supply of water in the face of growing population and economic development has thus become a challenge for sustainable development, especially in developing countries (Borgoyary M., 2002).

That water is a scarce resource and therefore needs to be managed in an economical manner is no longer a debate. However, what is a puzzle and still a problem is the socio-political factors that are often associated with treating water as an economic good. As mentioned above, not only are large areas of Asia and Africa experiencing droughts and floods, but they are also facing the implications of inefficient water management systems. The traditional strategy of responding to water shortages in semi-arid regions by increasing water supplies through capital intensive water transfer or diversion projects has clearly reached its financial, legal, and environmental limits. What therefore is required at present is a multidisciplinary approach to water resource management. Broadly, the following factors have to be incorporated for sustainable water use in developing countries (Borgoyary M., 2002).

a. **Initiate price reforms in the water sector to reflect the scarcity of the resource (re-evaluation of water).** There is considerable variation in the pricing of water across regions in the developing

countries and in some industrialized countries. For urban and agricultural water users, charges are based on the average rather than the marginal costs of supply. In developing countries, irrigation operation and maintenance cost recovery ranges from a low of 20 to 30 per cent in India and Pakistan to 75 per cent in Madagascar. These low charges for water imply lack of incentives to encourage efficient water use in the face of escalating water scarcity. While land productivity and crop prices rise over time, the price of using water remains constant, thereby leading to huge deficits. The immense socio-political support in favour of lower prices has no economic viability and studies have shown that an increase in price of water (for irrigation) will have a positive impact on productivity and lead to more efficient and economic use of water. Moreover, WTP surveys have indicated that developing countries are willing to pay a higher price for an assured and consistent supply of water. Studies have indicated that, in other sectors, given the assurance of a clean and consistent supply, consumers are willing to pay more.

Therefore, what is important is to initiate a price reform in developing countries that would not only reflect the scarcity aspects of the resource, but also lead to more efficient utilization of water resources.

b. **Appropriate institutional mechanism to implement reforms in water resources.** The economic approach to water valuation will be a failure unless there is a strong institutional framework that would enable a successful transition from the prevailing situation. Clear water allocation mechanisms, water user rights, and strong regulatory agencies are part of the institutional structure that needs to be put in place before a market can function. The conditions required for successful water marketing are:

    - Well-defined water rights so that there is no possibility of dispute over ownership issues.
    - Efficient administrative processes to offset abuses of the system and disputes over transfer of water rights and also to ensure the rights of use.
    - Infrastructure requirements should be in place to allow the easy delivery of water to the buyer.

c. **Involve all users and stakeholders in the reform process.** Instead of a centralized approach, where the state or agency is mainly responsible for the management and planning of water resources policies, a new institutional set up will be required. This would involve all the stakeholders (the water users and the legal entities, as well as the state/federal agencies) in management as well as planning aspects.
d. **Maintain water resource accounts at the national level.** The existing income accounting structure needs to be updated to account for the depletion or the degradation of the natural resources that is taking place due to development activities. Therefore, to reflect the actual income and to keep track of sustainable growth, each country should prepare a water resource account that will reflect the status of the water resources (both quantity and quality) of the country.
e. **Develop a multi-disciplinary approach to water management.** Water resource management

is no longer the prerogative of one discipline. An effective water management plan must be part of a broader, regional economic development plan that takes into account other sectoral dimensions such as agriculture, manufacturing, ecological, and health-related needs amongst others. Three factors are critical to a comprehensive approach to water management in developing countries:

- Integrating land and water management in river basins.
- Linking management of surface and subsurface water resources.
- Considering both water quality and quantity in water planning and management efforts.

Ethiopian experience: Water pricing in the Addis Ababa Water and Sewerage Authority (AAWSA)

Conveyance of water through pipes started in Addis Ababa in 1901. During this period water was delivered at no cost to the residents. In 1945 a tariff was set at a rate of 0.50 Birr/m^3 and it remained without any change for a period longer than almost half a century. A new water tariff system was initiated from July 1995 and the selling price was fixed as follows (Lisanework A. A, 2003):

0.50 Birr/ m^3 /month for the first 15m^3
0.75 Birr/ m^3 /month for the next 16 - 40m^3
1.50 Birr/ m^3 /month for any consumption greater than 40m^3 and
0.50 Birr / m^3 / month for all public taps

To assess the effect of water tariff increments, a sample survey was conducted by AAWSA which found that about 77 % of the respondents knew of the increase of water tariffs whereas 23% did not. Out of the respondents who knew about the increment, 32.9% felt the increment was too high, and 36.3% said it was a little higher than the previous, however, 30.8% did not state their views. The result of the sample survey ascertained that more than 68% of the interviewees consume the same amount of water as before the tariff increment. From the above presented fact it can be concluded that the tariff did not result in a decrease in consumption and was affordable.

At the same time, even though the tariff was increased, the water production and distribution expenditure of the authority did not decrease. This was due to the increase in the prices of pipes and fittings, maintenance, chemical, fuel and other expenses. The current tariff rate covers only 70 % of the operation and maintenance expenses of the authority. In order for the authority to cover its expenses with the tariff incomes, a new tariff system was studied based on the increase in population, per capita consumption and unaccounted-for water. Due to the shortage of water the current per capita consumption is very low. The tariff rate has been fixed, taking into consideration the current per capita consumption of .75 l/day, expected to increase to 100 l/day in the coming 20 years and also the expected reduction of the present 35% Unaccounted-for water to 25%.

The main objectives of the tariff are (Lisanework A. A, 2003):

- To develop and implement a policy of financial self-sufficiency for AAWSA operations;
- To ensure regular supply of water and sewerage services at a rate affordable to the urban poor;
- To bring the selling price of water at or near marginal cost; and
- To facilitate the access of low income sections of the population to safe drinking water.

Table 12.1: The New Water Tariff System of Addis Ababa

Water Consumption by Customers	1st year Tariff rate 2001/2002 Birr/m^3	2nd year Tariff rate 2002/2003 Birr/m^3	3rd year Tariff rate 2003/2004 Birr/m^3	4th year Tariff rate 2004/2005 Birr/m^3	5th year Tariff rate 2005/2006 Birr/m^3
Public Water Taps	**1.15**	**1.30**	**1.45**	**1.60**	**1.75**
Domestic 0 - 7 m^3	1.15	1.30	1.45	1.60	1.75
7 – 20 m^3	1.60	1.85	2.10	2.35	2.60
Above 20m^3	2.30	2.60	2.95	3.25	3.25
Industrial (all consumption)	2.30	2.60	2.95	3.25	3.25

Source: Lisanework A. A.: Water Demand Management Perspectives: Concepts and Applicability to the City of Addis Ababa, Case Study, WARREDOC, Perugia, 2003

Valuing water through demand management

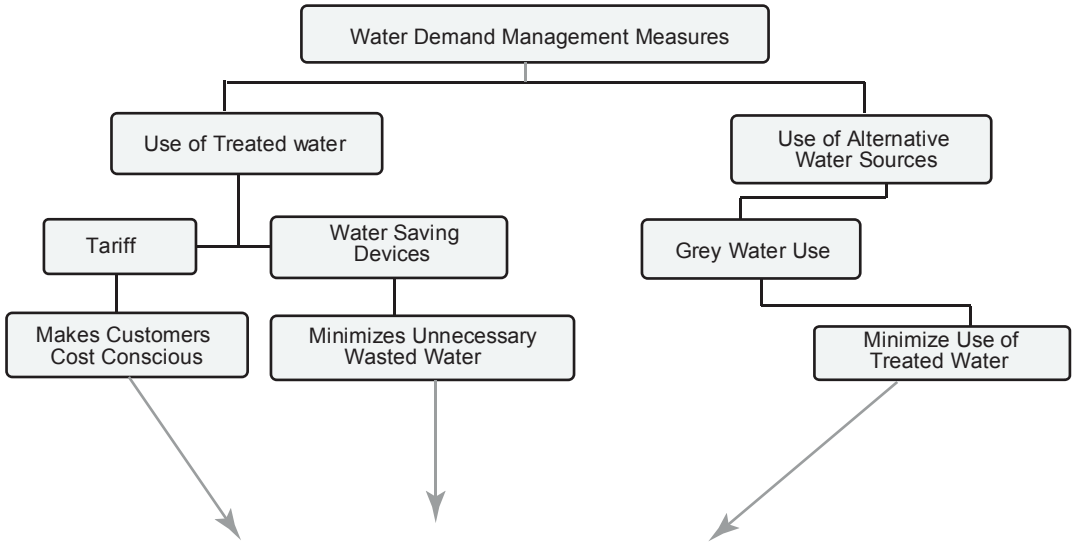
A wider concept than water pricing and cost recovery is demand management, which is the use of economic and legal incentives in combination with awareness raising and education to achieve more desirable consumption patterns, both in terms of distribution between sectors and quantities consumed, coupled with an increased reliability of supply. Although economic incentives are important instruments for demand management, they are by no means the only ones. In fact, in demand management the emphasis should lie on educational, administrative, legal and political actions to influence demand while safeguarding equity principles. The use of economic instruments to enhance efficiency of water use and promote financial sustainability should remain subordinate to these considerations. The major issues confronting developing countries are (Borgoyary M., 2002):

- Large numbers of poor do not have access to water (both in terms of quantity and quality);
- The price of water has been underestimated compared to the actual value of water (cost recovery is poor);
- Prevailing water policies have encouraged inefficient and overuse of resources as well as led to environmental problems (like salinity, clogging, etc.);
- Government subsidies have not been targeted to benefit the poor; and

- Public authorities responsible for services are generally ineffective.

Water resource accounts should be created at the national level that will reflect the status of water resources and enable their sustainable development.

Figure 12.1: Issues Involved in Water Demand Management



Source: Lisanework A. A.: Water Demand Management Perspectives: Concepts and Applicability to the City of Addis Ababa, Case Study, WARREDOC, Perugia, 2003

The main objective of water demand management is to contribute to a more efficient and equitable provision of water and sanitation services, and to reach this objective, a number of instruments have been developed. These instruments are interdependent and mutually reinforcing and the most optimal way they are applied will depend on the prevailing local conditions. In all cities, a distinction can be made between different income groups (high, middle and low) between the different types of urban areas they live in and hence between the different water demand management measures which are applicable. A broad range of approaches and instruments exists for Water Demand Management, ranging from economical to socio-cultural and technical tools, which can be divided into: (Lisanework A. A, 2003)

1. Water conservation measures:

- Leakage detection
- Reduction of illegal connections
- Use of water saving devices
- Out-of-house water saving measures

2. Water pricing measures:
- Water metering
- Tariff structures

3. Information and educational measures:
- Awareness raising
- Public involvement
- In-school education

4. Legal measures
- Rules and regulations that form the basis of WDM policy
- Regulations on resale of water

Privatization or public-private partnerships

Once agreement exists over what type of functions and decisions can best be made at what level, a next policy option is that of privatization. The drive towards privatization forces the following question to be asked: Which functions should be retained by government organizations, by constituencies (think of organized water users at certain levels in the river basin), and which functions can best be executed by private bodies and companies?

Here it is expedient to distinguish the caretaker function of government from its production function. The caretaker function is concerned with safeguarding the national interests and assets, and may include issues such as monitoring water rights, providing storage, flood protection, multipurpose works, monitoring water quality, and ensuring catchment protection. This caretaker function is a typical role of government not suitable for privatization. The production function may involve the provision of specific services in water sub-sectors, such as irrigation and drainage, water supply and sanitation, and energy. The production function may, in principle, be privatized; but only if the nature of the good (or service) is prepared, and if there is no threat of monopoly formation or other market failures.

The experience so far with privatization of water companies in a country such as the UK is not reassuring. In practice this means that pure privatization is rarely an option in water resources management. A greater role for the private sector in many ways also requires a stronger role for government. A better term for privatization may thus be "public-private partnership." Most arguments for involving the private sector in water management activities are centred on the need to improve delivery efficiency through the infusion of private capital (Andah K. 2002).

The level of unaccounted-for water in most of the water supply distribution systems is very high in almost all urban centres in Africa, at best around 50%. This loss has two components: the physical

water losses and non-revenue losses. The task of recovering the unaccounted for water and revenue has become arduous in many countries due to lack of capital investment for modernization of the distribution network and also for an effective metering system. This situation has led to the call for either private participation in or privatization of the water supply system as the ongoing debates in Ghana amply testify (Andah K. 2002). The Ghana Water Company, after futile attempts at improving the efficiency of the distribution network with World Bank support of about six million dollars, came to the conclusion that there is the urgent need for substantial capital investment that can only be found through private participation in the water distribution. There is however, a strong opposition to this recommendation from some political parties, NGOs and sections of the urban population.

It is now generally accepted that water is not only an economic good but also a social good. This means that any new strategy must not only be based on pure economic and financial considerations but should also take account of the need for equity and the basic needs of the poor and vulnerable. One of the bones of contention in the Ghanaian debate regarding tariffs is on how to define the socially necessary water demand. While the NGOs prefer a geographical approach based on the level of affluence, the official sources opt for a fixed monthly volume of water to be socially priced within an increasing block tariff system. It must be noted that due to lack of data on African residential households, this type of tariff system more often leads to the poor subsidizing the more affluent households (Andah K. 2002). In the absence of an effective control and regulatory body for monitoring water supply and sanitation provision by public and municipal institutions, the question arises as to which body would defend the poorer sections of the society from a privatized system.

Valuing water in Congo

In Congo, water is recognized as:
- A vital resource
- An economic good
- A social good
- A waste carrier
- An environment protector
- A source of conflict and stake for peace
- A fundamental element for cooperation and regional integration
- A stake for equity and gender

(AWDR National Report, Congo)

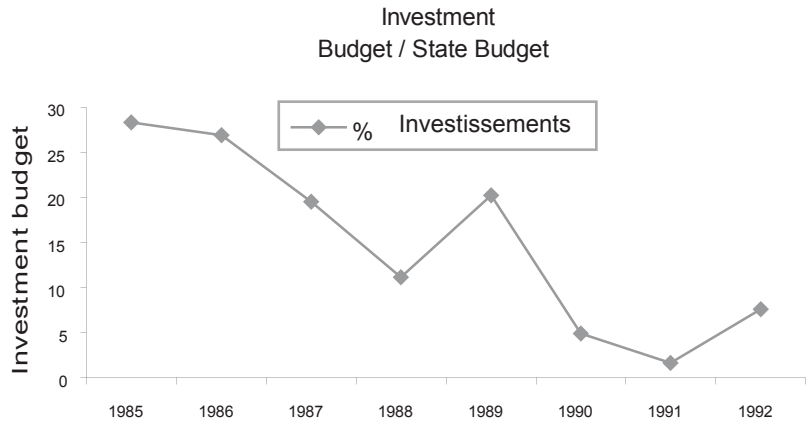
Targets description

The main targets concerning this challenge have been identified in the Africa Water Vision 2025.

They are related to the strengthening of a financial basis so as to guarantee the future of water resources and include the following:

- The sustainable financing for political and institutional reforms and capacity development should be initiated by 2005 and operational before 2015;
- The sustainable financing for the production and information management is to be initiated in the country by 2005 and operational by 2015; and
- The funding of water priority needs by the setting up of a tariff system, the increase of private sector participation and the mobilization of funding at national and international levels will be on track before 2005 and operational or totally assured in the country before 2015. (AWDR National Report, Congo)

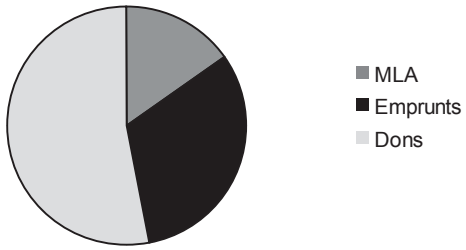
Figure 12.2: The Evolution of the State Budget from 1985 to 1992



Source: AWDR National Report, Congo

The distribution of investments made in 1992 between the different sub-sectors of activities (water supply, sanitation, agriculture) and by sources of funding as shown in the figures below (AWDR National Report, Congo).

Figure 12.3: Drinking Water Sub-sector Investment Distribution, 1992

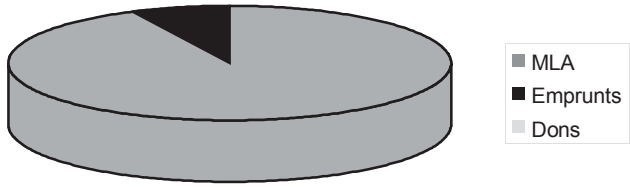


Source: AWDR National Report

Figure 12.4: Sanitation Sub-sector Investment Distribution, 1992

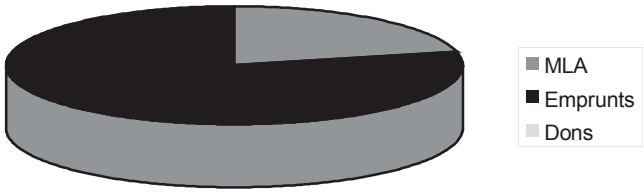
Source: AWDR National Report

Figure 12.5: Hydroelectricity Sub-sector Investment Distribution, 1992



Source: AWDR National Report

Figure 12.6: Fish Resources Sub-sector Investment Distribution, 1992



Source: AWDR National Report

Level of Cost Recovery for Drinking Water in Urban Areas in Congo

In the final report of the SNDE Tariff Survey completed by la Société Générale d'Industrie (SGI) consultants (March 1990), with financial support from the ADB, an analysis of the financial situation of the company was carried out for the years 1986 and 1987. It appeared that the updated water selling prices are by far below the average balance tariff (AWDR National Report, Congo).

Table 12.2: Level of Costs Recovery: Situation in 1986 and 1987

Tariffs and costs	**1986**	**1987**
Average balance tariff	244	360
Direct cost tariff	182	177
Updated selling price	127	123
TME / PVA	1.92	2.93
TCD / PVA	1.43	1.44

Source: AWDR National Report (Tariff Survey SNDE)

The ratios show that the average selling prices in 1986 and 1987 had to be increased by 40% to cover the direct exploitation costs, by 100% in 1986 and 200% in 1987 to cover the total exploitation costs and balance the accounts (AWDR National Report, Congo).

For the year 1990, the survey proposed three values of average tariff balance:

- Complete cost without royalties - 374 FCFA/cubic meter/s
- Cost without debt service - 291 FCFA/ cubic meter/s
- Complete cost with royalties–406 FCFA/ cubic meter/s

References

Andah K.: Water and Peri-Urban Settlements. Contribution, E-Conference on Toolkit for Improved Water Supply and Sanitation Services among the Urban Poor, 2002. http://www.jiscmail.ac.uk/archives/sup.html

AWDR National Reports (Congo Rep., Nigeria, Cameroon, Benin, Burundi, Niger, D.R. Congo, Gabon), 2003.

Borgoyary M.: Valuation of Water: Options for Sustainable Development in Developing Countries

Caponera D. (1988): Water Law and administration. Lecture Notes, International Advanced Course on Water Resources Management, WARREDOC, Perugia.

Donkor S.M. K.: Development Challenges of Water Resource Management in Africa, Afro-Asian Parliamentarians Forum for Population and Development. ECA, 2002.

ECA, 2001. Safeguarding Life & Development in Africa – A Vision for Water Resources Management in the 21st Century. The Hague, The Netherlands, March 2000, First Edition.

ECA: Water Sharing as an instrument of Regional Cooperation in Africa, Inter-Agency Group on Water in Africa. ECA. 2001

GEO – 2000 Global Environment Outlook, UNEP, Earthscan, 1999.

GEO-3: Global Environment Outlook 3 - Past, Present and Future Perspectives, UNEP, Earthscan, 2002.

Gonzalez Villarreal F.J.(1980): Central Planning in Water Resources Development. In Water Resources Planning Experiences in a National and Regional Context, Publ. TCD/SEM.80/1, 298 pp, United Nations, New York. Report of a UN Workshop convened in Co-operation with the Government of Italy - Castelgandolfo and Stresa, 1979.

O&M Working Group, Water Supply and Sanitation Collaborative Council Operation and Maintenance of Urban Water Supply and Sanitation Systems, WHO, 2002.

ECA/WMO (1995): International Conference on Water Resources: Policy and Assessment, Report, Addis Ababa.

UNESCO: United Nations World Water Development Report, UNESCO, Paris, 2003

Yilma W. E.: Keynote Address - Coping with Safe Drinking Water Demand by the Year 2010. In Andah K., & Sannoh S. (Editors): Water Resources Management in Drought-Prone Areas. Proceedings of an International Workshop, Addis Ababa, March 18-22, Grifo publishers, Perugia, 1996.