IWRM Action Hub

IWRM TOOL - C4.01

# Pricing for Water and Water Services

**Summary**

**Water is arguably the most valuable resource on the planet, yet it is difficult to price due to its nature as a common property good often with non-rival usage. Pricing and other economic instruments however have immense potential in terms of enhancing water use and allocation. This Tool discusses the challenges policy makers face when designing a water pricing framework, reviews concepts from economic theory to build a tariff structure, and explores some of the practical issues and set key considerations for implementing tariffs.**

## Why is it Difficult to Value and Price Water?

Putting a price on water in the sense of providing social, economic, and environmental benefits is desired. However, it is a rather difficult task because of its physical, economic, and social characteristics. Garrick, Hanemann and Hepburn (2020) identify five key features that constrain conventional economic prescriptions for water policy, in particular water pricing, from the supply side and demand side. Related to the former, the mobility of water makes it difficult to bound and measure (multiple and sequential uses that make it not a standardised commodity, but a heterogeneous commodity). Its variability (spatially, temporally, and in terms of quality) makes it difficult to measure and allocate rights. And its heaviness makes it capital intensive to store and transport. On the latter, water has multiple uses that make it difficult to compare the value of water across private and public goods. Finally, many of those uses are non-rival, that is, it can be consumed repeatedly without the fear of depletion due to is physical properties.

**The Theory of Water Pricing**

- **The challenge**: As Grafton, Chu and Wyrwoll (2020) argue, policy makers in charge of pricing water have to solve the 'paradox of water pricing': water almost never equals its value and rarely covers its costs. Their ultimate societal goal is to "is to supply water services at the lowest feasible cost (including private and external costs), charge the lowest possible price (while ensuring all costs are paid), and, thereby, deliver the largest possible consumer surplus (benefit from consumption) over time". To achieve this goal, a society faces important challenges: 1) accounting for external costs such as the impact on ecosystems and water reserves for the future; 2) ensuring water to supply basic human needs; 3) covering all costs (fixed and variable) of water provision; taking into account all market and non-market values of water across different uses.
- **Conflicting values**: when policy makers have the task of designing a water pricing framework, they should find a tradeoff among the social values that a society pursues. In terms of water policy, this discussion is about three objectives: Efficiency, Equity, and Environmental Sustainability (SIWI, 2016). Equity means that the way water is allocated and used is perceived as fair in society and that the human right to water is respected. Efficiency means that water and the resources invested in it are not wasted, but used productively, and in the most economically efficient way. Finally, environmental sustainability in water management means that water resources are used in a way that meets the needs of the present without compromising the ability of future generations to meet their own needs.
- **Three Pricing Options**: As explained by Grafton, Chu and Wyrwoll (2020), water tariffs can be designed using three main options (see Fig. 1). (1) Miscellaneous Charges or subsidies that are not directly part of water pricing but can be used to deliver socio-economic goals. (2) A Flat Charge independent of the water used, levied to ensure the high capital costs of providing water services are fully covered. (3) A Volumetric Price that can vary with the level of water use. This can be uniform (the same for all consumers at all times of the year (independently of water scarcity and all levels of consumption) or variable (depending on amount of consumed water, season or time of use, and user characteristics). A variation of volumetric pricing is block rate pricing by which customers are charged a higher or lower price per unit of water consumed beyond a given block or volume of water consumed. This instrument is used to provide incentives for users to conserve water.

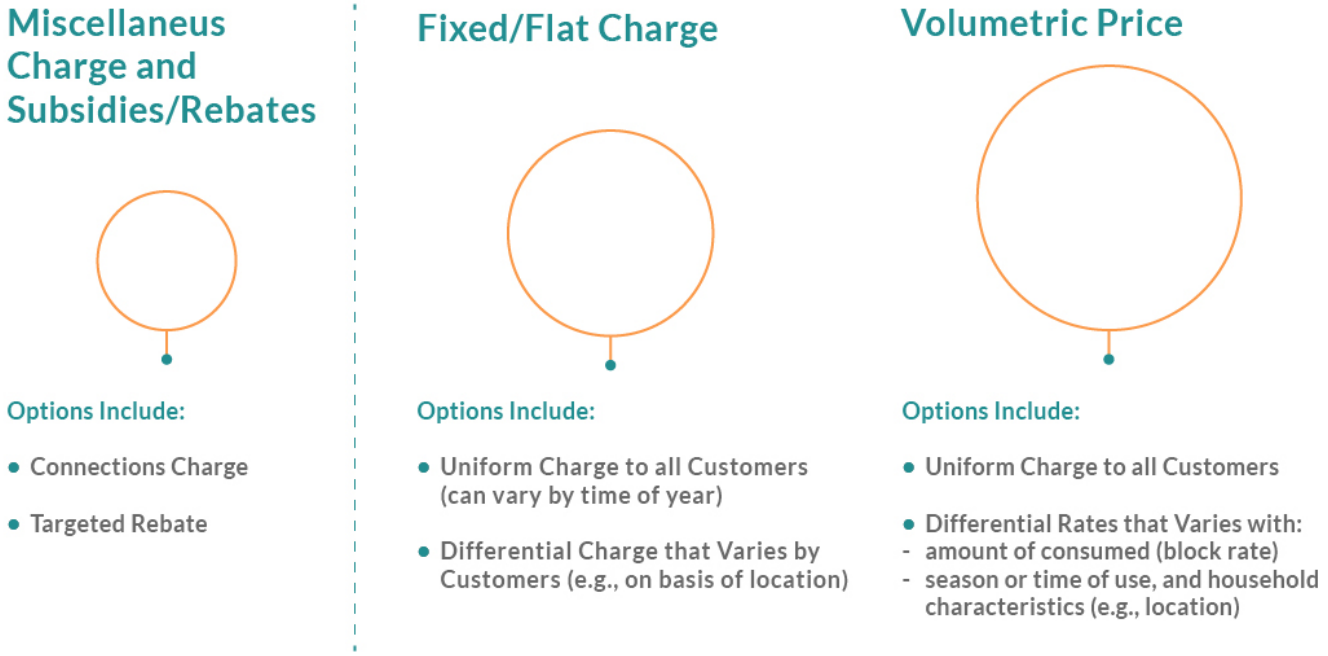

**Figure 1**: Water Pricing Options (Adapted from Grafton, Chu and Wyrwoll, 2020)

- **Two Options for Price Setting**: The price of water can be determined using two different institutional mechanisms. On the one hand, Administrative Water Pricing refers to the price-setting process by a public authority, usually a service operator or regulator (ideally with some degree of independence), under considerations such as supply-related costs, opportunity and externality costs from the water use, or social goals. On the other hand, Market-Based Pricing is based on a decentralized pricing mechanism (based on supply and demand of water) for water rights, based on land ownership, or tradable water use permits. Both mechanisms have their pros and cons; whichever is chosen will be permeated by historical, social, and political factors that will make more or less effective in setting a 'right' price for water.

### Charges for Water Services

The supply of raw or bulk water needs major infrastructure and other works in catchment management, afforestation, dams, reservoirs, pipelines, etc. The cost of these works is partly borne by the state (as a public good, justified by strategic considerations, drought prevention, flood control, environmental protection, etc.) and partly imposed on the main beneficiaries – urban users, farmers, hydropower companies, mines, industries, etc. as a raw/bulk water infrastructure charge (e.g., the South African Raw Water Infrastructure Charge). Below are the main types of charges related to water services.

**Non-consumptive charges**: Water charges applied to hydropower or thermal power generation and industrial cooling applications. These charges are normally at a lower rate than for consumptive use, although non-consumptive use does entail some opportunity cost, where water is stored, released into a different part of the catchment, or with its quality or temperature altered. Some countries (e.g., Colombia, Brazil) charge a royalty or a financial compensation of the amount of energy produced. The revenue generated is allocated mainly among water authorities, states, and municipalities, who in theory could use it for water management improvements (funds are not necessarily earmarked for this purpose) (SIWI, 2016).

**Irrigation water charges**: Water for irrigation tends to be subsidised. Volumetric pricing through metering is rarely feasible, and consumption proxies tend to be used, such as acreage, type of crop, and size of harvest. To encourage efficiency of water-use in agriculture, accurate volumetric charges for water would be ideal, however, this is very difficult politically and can risk imposing unreasonable costs poor farmers if implemented badly. Irrigation districts and water user associations are sometimes used to assist with the implementation of water pricing, pooling the resources of a number of individual farmers in order to jointly manage the water system and its associated costs. In some cases, these organisations purchase water from the government or source provider, and then charge a tariff or operate a market-based pricing scheme to allocate among the association members (SIWI, 2016).

**Household and industrial water tariffs**: These tariffs signal the economic value of water to consumers. Volumetric tariffs are more versatile than fixed charges and can provide an incentive for careful use. Linear Tariffs, Increasing Block Tariffs (IBT), and Decreasing Block Tariffs (DBT) are different systems of volumetric charges for water. They all need proper meters and appropriate rates to be fair and effective. In last decades, Full Cost Recovery and Sustainable Cost Recovery principles have gained momentum (Tool D2.03), providing for water supply and sanitation tariffs, on the one

hand, the opportunity cover operation and capital costs as well as environmental and resource costs associated with the consumption of the service, and on the other hand, a combination of user charges and public transfers, enabling the water utility to count on them to finance investment (OECD, 2021).

**Effluent charges**: The treatment of urban wastewater is a public good whose cost is either subsidized by the state or recovered from a surcharge on household water tariffs. The latter signals to households the cost imposed on society from treating the water that they consume. Industrial effluent charges are normally levied on the company discharging the wastewater, based on the estimated presence of specific constituents in the effluent. The effluent charge can play an economic role if it is set at a level that reflects the social cost of treatment – the discharger can then decide if it is cheaper to pre-treat or avoid the discharge in some other way. In addition to using wastewater tariffs for cost recovery, economic instruments can be used to incentivize pollution prevention. Most commonly, liability rules for release of pollutants and related effluent taxes are established according to the polluter pays principle (SIWI, 2016).

### Key Considerations for Successful Water Pricing

- **Public acceptance**: People may need a public information campaign to persuade them, if they are used to regarding water as a gift of nature. Also, a thorough demand survey and consultations with consumers are required for consumers' acceptance of a new tariff regime.
- **Associated improvements in the quality of service**: This makes tariff increases more acceptable, which implies to have better financial and management practices with a focus on customer service culture orientation in water utilities.
- **Strong political backing**: This includes the avoidance of extravagant and unaffordable promises before elections and understanding the importance of having an independent water authority that gives stability to administrative decisions.
- **Targeted provision for poor or disadvantaged consumers**: Even though it is recommended to separate water tariffs policy from social policy, when using tariff schemes for that goal, it is important to make sure (by monitoring and evaluation) that tariffs are working as intended and do not end up costing disadvantaged users disproportionately more.
- **Policy Alignment**: Pricing of water alone will not have its desired effect towards better conservation efforts if it is weakened by policies elsewhere that pull in the opposite direction.
- **Billing and Revenue Collection**: Improvements in billing and in the rate of collection can have the same effect as tariff increases, without attracting as much opposition.

### Thematic Tagging

Water services

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