Integraal Waterbeheer

ECONOMICS OF WATER MANAGEMENT

NAOMI MENDESZOON
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Inhoud

- Belang van water
- Economische aspecten van Watermanagement
- Belangrijke economische aspecten
- Waterbeheer in de landbouw
- Urban waterbeheer
- Smart water management
- Klimaatverandering

Belang van Water

Sustainable Development Goals

Economische aspecten van Watermanagement

Verschillende belangrijke elementen die verband houden met de allocatie, distributie, en het gebruik van waterbronnen.

Belangrijke economische aspecten - I

- Waterschaarste
- Waterprijzen
- Investeringen in Infrastructuur
- Waterbeheer in Landbouw
- Industrieel Watergebruik

Belangrijke economische aspecten - II

- Urban Waterbeheer
- Waterhandel en Waterrechten
- Kosten voor Watervervuiling
- Klimaatverandering en Watermanagement
- Water en Toerisme

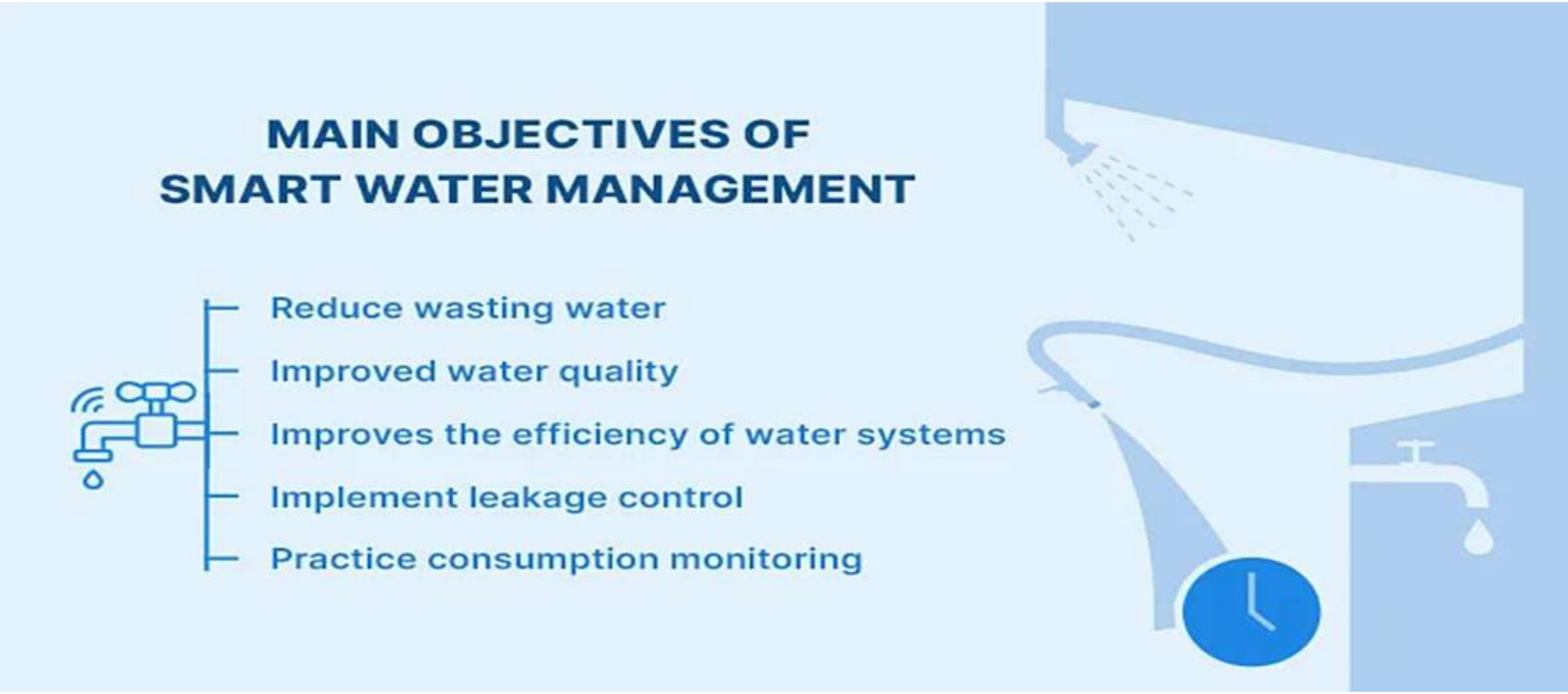
Waterbeheer in de landbouw

- Efficiënt Watergebruik
- Gewaskeuze en Waterbehoefte
- Bodem- en Waterbeheer
- Watervoorraden en Opslag
- ~~Waterrechten en Waterverdeling~~
- Klimaatverandering en Waterbeheer
- Financiële en Technische Ondersteuning

Urban waterbeheer

- Drinkwatervoorziening
- Afvalwaterbehandeling
- Overstromingsbeheersing
- Verbeterde leefbaarheid
- Economische aantrekkingskracht
- Water gerelateerde toerisme

Smart Water Management



Klimaatverandering

- Watertekort en droogte
- Overstroming en waterafvoer
- Veranderingen in Rivieren en Gletsjers
- Zeeniveaustijging
- Waterkwaliteit
- Adaptatie aan Klimaatverandering
- Internationale samenwerking


THANK
YOU!

ECONOMICS OF WATER MANAGEMENT

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07-08-2023

RELATED COURSES

- Economics of water management – N. Mendeszoon

CONTENTS

- Water management principles
- Economics of Water Management

WHO (World Health Organization):

Sustainable Development Goal 6:

- Ensure availability and sustainable management of water and sanitation for all

Target 6.1:

- By 2030, achieve universal and equitable access to safe and affordable drinking water for all

Indicator 6.1.1:

- Proportion of population using safely managed drinking water services (drinking water from an improved water source that is located on premises, available when needed, and free from faecal and priority chemical contamination).

WATER MANAGEMENT PRINCIPLES

At the International Conference on Water and the Environment, convened in Dublin, Ireland, in 1992, four main principles of water emerged that have become the cornerstones of subsequent water sector reform:

1. **Principle 1:** ***Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.***

- Freshwater is a finite resource because the hydrological cycle on average yields a fixed quantity of water per period, and the quantity of water resources cannot be adjusted significantly by human actions;
- As a resource, water is paradoxically vulnerable to development and essential to development.

WATER MANAGEMENT PRINCIPLES

2. **Principle 2:** ***Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels.***

- Where water is concerned, everyone is a stakeholder

WATER MANAGEMENT PRINCIPLES

3. **Principle 3:** ***Women play a central part in the provision, management and safeguarding of water***

- Women play a key role in the collection and safeguarding of water for domestic use, and in many countries agricultural use. When water is not supplied by a piped system, the burden of water collection falls on women and children, who must expend considerable time and energy on this activity;
- However, women are less instrumental than men in key areas like management, problem analysis and the decision-making processes related to water resources.

WATER MANAGEMENT PRINCIPLES

4. **Principle 4:** ***Water has an economic value in all its competing uses and should be recognised as an economic good as well as a social good.***

Value versus charges:

- The ***value of water*** in alternative uses is important for the rational allocation of water as a scarce resource, whether by regulatory or economic means;
- ***Charging for water*** is applying an economic instrument to achieve multiple objectives as follows:
  - To support disadvantaged groups;
  - Influence behaviour towards conservation and efficient water usage;
  - Provide incentives for demand management;
  - Ensure cost recovery; and
  - Signal consumer willingness to pay for additional investments in water services.

WATER: ECONOMIC OR SOCIAL GOOD?

When is it appropriate as an economic good?

Treating water as an economic good is imperative for logical decision making on water allocation between different, competing water sectors, especially in an environment of water resource scarcity. In countries where there is an abundance of water resources, water is less likely to be treated as an economic good since the need to ration water usage is not so urgent.

Why is water a social good?

Although water is an economic good, it is also a social good. In countries where there is an abundance of water resources, there is more of a tendency to treat water as a social good to fulfil equity, poverty alleviation and health objectives over economic objectives.

WATER: ECONOMIC OR SOCIAL GOOD?

Question:

- In the real world, in a situation of water scarcity, should water be provided to a manufacturing plant because the manufacturer has the ability to pay more for water than thousands of poor people who have no access to safe water? Why/why not?

WATER: ECONOMICS VS FINANCE

- ***Economics*** refers mainly to situations in which a decision must be taken regarding the allocation of scarce resources among alternative uses. Water prices, water tariffs, water rights, and water policies and regulations are among the most important economic instruments. Economic instruments are evaluated in terms of impacts on efficiency, equity and environmental outcomes for society;
- ***Finance***, on the other hand, refers to specific actions taken by organisations or firms, which can be private or public, in order to maximise short or long-run returns to their assets and investments. Standard financial tools are those that are under control of the firm and that affect resource flows to achieve goals, like loans, shares and cash management. Financial tools are evaluated in terms of effectiveness to achieve stated goals by the firm.

WATER: ECONOMICS

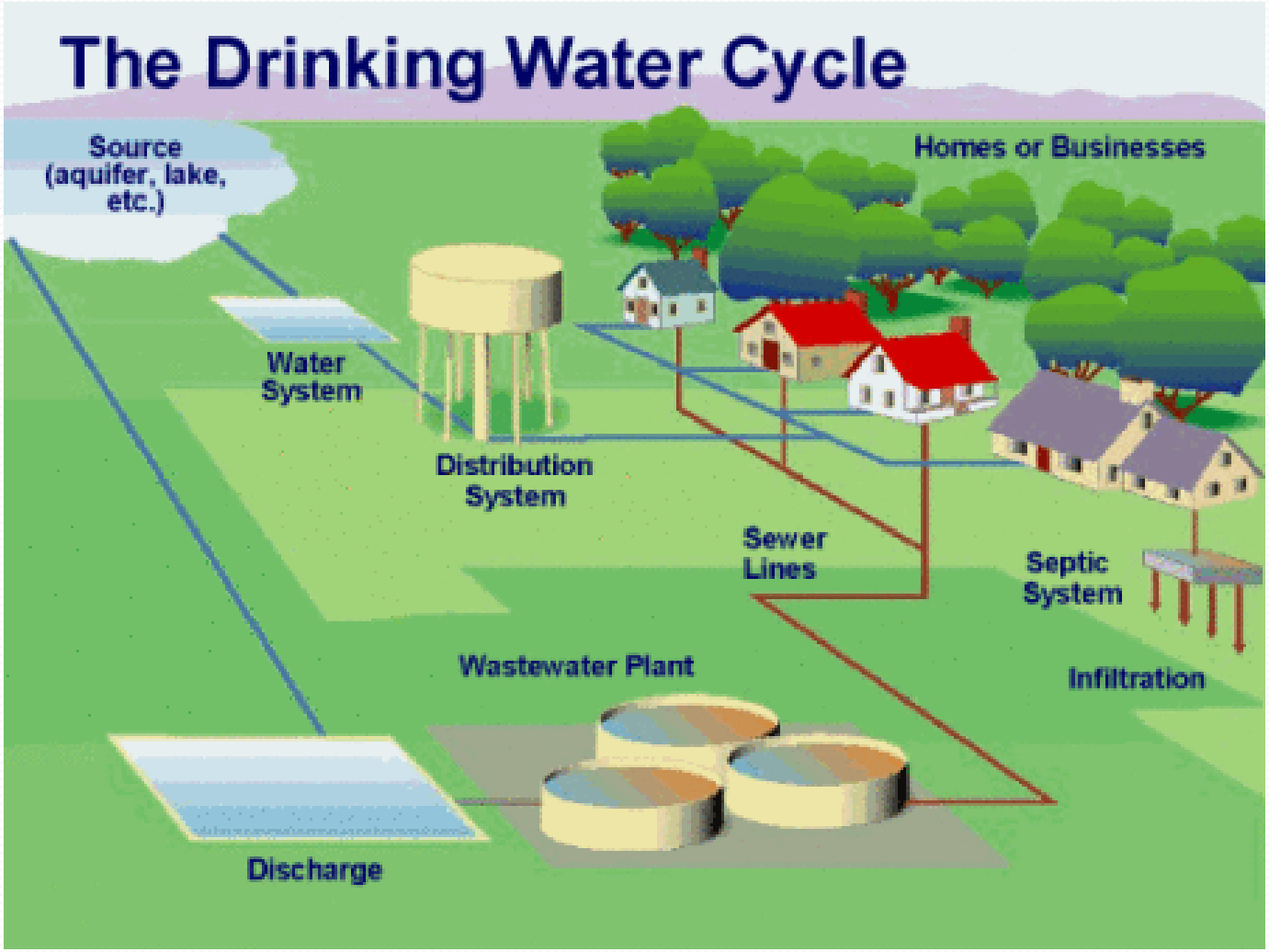
Water is a scarce product, with multiple competitive uses, that needs to be treated and which commands a price.

Economics is about making choices when resources are scarce:

- when water is polluted and needs to be consumed;
- when investments are necessary to connect more people to drinking water and sanitation systems;
- if there are competing claims: water for human consumption, for agriculture and for industry.

WATER: ECONOMICS

WATER: ECONOMICS



ECONOMIC AND FINANCIAL INSTRUMENTS

- The best-known economic instruments are taxes, subsidies and the determination of prices, or – once such price is fixed by some authority – the tariff. The fixing of these prices is usually not left to the market, for example, because the price is very important for poor people
- Related economic principles (besides *rational use of water*), which are also used in the water and environmental economics, are *cost recovery* and *the polluter pays*.

The financial instruments subsequently help to take specific investment decisions.

EVALUATION CRITERIA

Evaluation criteria used in designing economic instruments:

1. Economic efficiency:
   - To ensure economic efficiency, user charges such as water rates should cover the real cost of providing water (including environmental externalities), and when possible, reflect the opportunity cost (opofferingskosten = opbrengsten beste niet-gekozen alternatief minus opbrengsten gekozen optie) of the resource. Charging should be responsive to water scarcity, population growth and increases in income, since these changes inevitably result in higher water supply–demand imbalances;
2. Equity (= rechtvaardigheid):
   - When we speak of achieving equity in water, we are generally concerned with the situation of vulnerable groups of society excluded from access to basic goods and services (in this case, to water).

EVALUATION CRITERIA

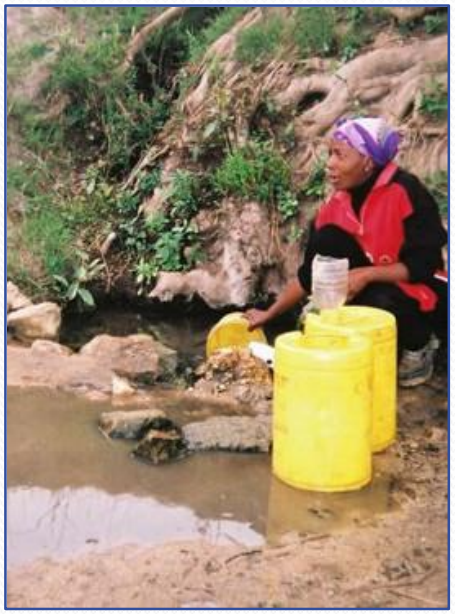
3. Environmental sustainability:
   - The relationship between environmental objectives and the functioning of water systems can be very complex. For example, if the overall effect of economic policies is to favour rapid economic growth with intensive use of contaminating processes, the water sector will only amplify this, since water will be allocated to the activities favoured by these policies;
4. Administrative and political feasibility:
   - It is senseless to adopt economic instruments that are difficult to implement. For instance, water tariffs based on marginal cost pricing, which charges on the basis of each additional unit consumed, is administratively unfeasible in the absence of metering;
   - The utilisation of user fees is a sensitive matter for most governments which want to control the rate of price inflation, and fear the political repercussions of price increases for basic services.

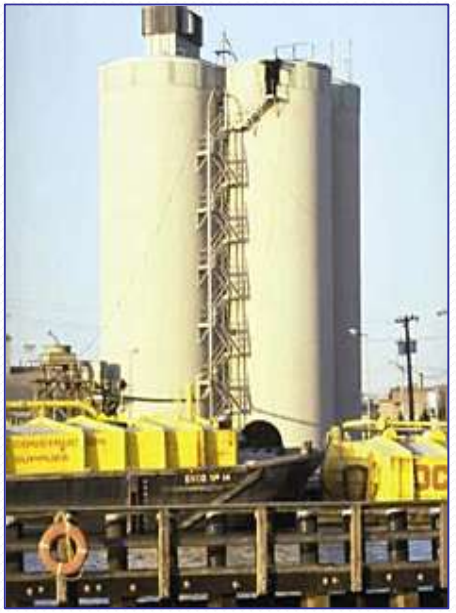
EVALUATION CRITERIA

Question:

- To which of the alternative evaluation criteria would you give more weighting in designing economic instruments for IWRM (Integrated Water Resources Management) in your country? Why?

ECONOMIC INSTRUMENTS FOR WATER MANAGEMENT





Different water users among whom water must be rationed, using economic instruments

TYPES OF ECONOMIC INSTRUMENTS

1. ***Water tariffs***
   - Water tariffs are broadly defined as all charges and levies imposed on the user of a service, if such charges bear some direct relation to the provision of the service. The cost of abstracting, storing, transporting, treating and distributing water to major sectors such as households, industries and farmers, is recovered (partially or wholly) from charging tariffs to the users.

Objectives of water tariffs

- Consumers and suppliers of water have different expectations of water tariffs. Consumers want high water quality at an affordable and stable price. On the other hand, suppliers like to cover all costs and have a stable revenue base.

TYPES OF ECONOMIC INSTRUMENTS

- **Types of tariffs**

1. The tariff is directly linked to water consumption (variable) or not (fixed);
2. It is a combination of variable and fixed parts;
3. The tariff level changes as more water is consumed (generally increasing or progressive system) in which the change can occur in blocks.

TYPES OF ECONOMIC INSTRUMENTS

- A ***fixed rate tariff*** (which does not vary with use) will suffice to raise revenue, but will have difficulties in influencing water demand and avoiding water waste.
- A ***variable (volumetric) tariff****:* Users pay strictly according to what they consume. It requires metering (or other cruder methods of measuring usage). This may not be necessary or feasible in situations such as rural connections or the supply of low volumes to poor urban users. Generally, it is used with variable blocks, since these allow the tariff to be increased or decreased along blocks. These types of tariffs are used by water utilities in cities, generally with a small fixed amount for the connection service.
- ***Fixed and variable tariff (or two-part tariff):*** In this case, users pay one amount independently of consumption, and also per unit consumed. The variable part can be also designed by using blocks to allow for changing charges along blocks. This is preferred in some irrigation systems with good water measurement, and also in bulk water tariffs in which there is a significant part of costs that is fixed.

TYPES OF ECONOMIC INSTRUMENTS

2. Irrigation water charges:
   - In almost all ***public*** irrigation schemes, the prices charged for water are well below full cost recovery levels and usually only a fraction even of the recurrent costs of operation and maintenance. Many farmers (large or small) pay no formal charges for their water, though they may make informal payments to obtain access to public irrigation services. In comparison, farmers with their own water sources pay the full cost of water, e.g. from groundwater pumping (unless energy is subsidised).

TYPES OF ECONOMIC INSTRUMENTS

3. Abstraction charges or bulk-water tariffs:
   - A water abstraction charge or tax is levied on the off-take of water from surface or ground sources. Where accurate measurement and monitoring are feasible, the tax may be charged in proportion to the amount of water withdrawn. When this is not feasible, the abstractor may be allowed to take water up to a specified limit, and pay a licence – subject to periodic monitoring.

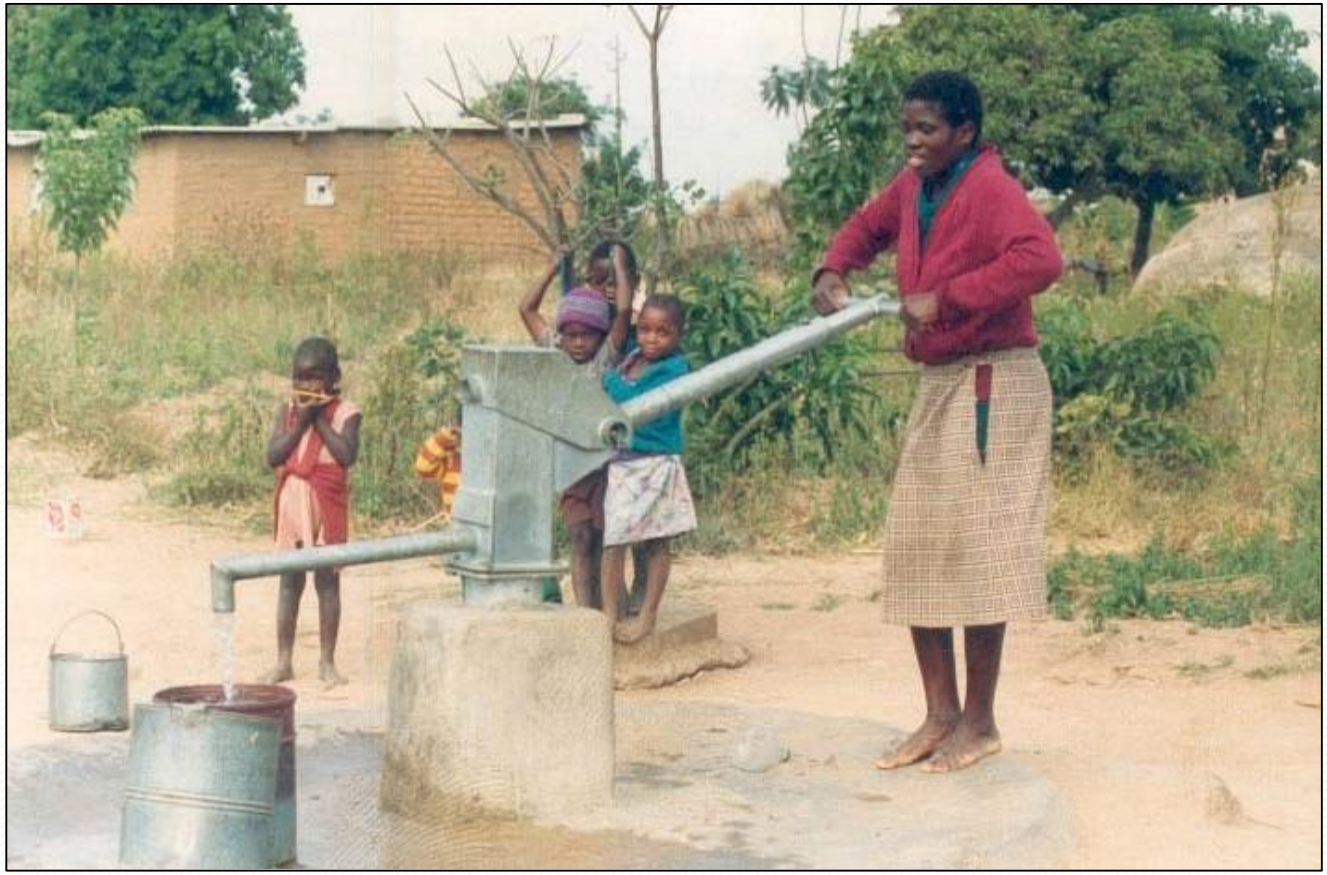
TYPES OF ECONOMIC INSTRUMENTS

4. Sewerage, effluent and waste water charges:
   - Where public sewerage networks exist, it is sensible to encourage households and businesses to connect up and use them. The extra cost on the system from additional users is normally insignificant, except for major industries; and there are public health benefits from using central collection and treatment rather than private solutions. It is also important to maintain an adequate throughput for sewers and wastewater treatment plants to function properly;
   - Sewerage charges (which are normally added as a surcharge to freshwater tariffs) should not be disproportionate; otherwise, users – particularly industries – will turn to other options of pre-treatment or disposal which are less desirable or efficient.

TYPES OF ECONOMIC INSTRUMENTS

5. Water subsidies:
   - Water subsidies should be used to promote social equity, growth, employment and increased incomes in particular economic sectors. A case for subsidisation and social equity occurs where the water service primarily benefits the individual user, but its consumption needs to be encouraged for public benefit or saving;
   - Approximately 20 to 40 litres of water per person per day (lcpd) is sufficient to meet essential needs and to attain the main health benefits of water use.

TYPES OF ECONOMIC INSTRUMENTS



Consumers must have access to a basic quantity of water for human health and survival

TYPES OF ECONOMIC INSTRUMENTS

Subsidies to water users are management tools that can be justified on the grounds that:

- Many users are poor and could not afford cost-recovering tariffs (This is particularly true of the unserved populations targeted by the SDGs.);
- The use of safe water sources and basic household hygiene should be promoted since they improve public health. Likewise, encouraging the safe disposal of sewage has environmental and public health benefits. These reasons justify subsidy of water/wastewater services;
- Subsidies can be used to accelerate the uptake of water-saving or pollution-reducing measures by both firms and households.

TYPES OF ECONOMIC INSTRUMENTS

6. Pollution taxes:
   - Some countries levy environmental taxes on wastewater effluent discharged directly into natural watercourses. This practice is based on the Polluter-Pays principle;
   - The structure and rate of the pollution tax is usually designed based on the concentration of specific pollutants, and is intended to and therefore helps encourage in-plant treatment prior to discharge. In effect, it reduces wastewater treatment costs.

Exercise

- Which economic instruments are applied in your country?
- Are they achieving the goals and objectives of facilitating IWRM implementation?


THE END