
Part 2: Building Successful WUAs

Module 6: Financial Management of WUAs

Unit 6.1

General concepts

Main objectives of irrigation water charging

The objectives of water charging can be many and not always compatible. The most common ones are:

1. To cover the costs of providing the **irrigation service** without subsidies.
2. To recover the **capital costs** used for the infrastructure.
3. To fund adequate maintenance
4. To improve accountability of the irrigation provider to the users.
5. To ensure equal or fair access to water

Terminology

The terminology used to designate the different charges related to water is confusing. Some of terms used are:

- ◆ ***Irrigation Water charges = Irrigation Water fees = Irrigation Water tariffs.*** It includes the totality of payments that beneficiaries pay for irrigation water
- ◆ ***Irrigation service fee = O&M costs= MOM costs*** one of the components of the water tariff related basically to the cost of the services of providing irrigation water (operation and maintenance costs).
- ◆ ***Water price = often used in the literature as synonymous of water charging but conceptually is different.*** Normally it refers to the monetary value assigned to a cubic meter of water. Theoretically its use should be limited to the cases where the price includes the notion of benefit (for example when farmers sell their groundwater to other farmers, or in the case of domestic water supply)

Payment of water fees

- ◆ **Proper financial management is the bases for a sustainable WUA.**
- ◆ **The greater risks for financial mismanagement is the non-payment of fees and corruption practices within the WUA.**
- ◆ **Non payment of water fees should result in penalties specified in the by-laws and eventually in the cessation of the water service.**
- ◆ **Payments must be conmesurated with the farmers income.**

• Process for establishing the annual water fee

- ◆ **The following is a typical process for establishing the water tariffs**
- ◆ **the WSP estimates the next year's total cost of operation, maintenance and administration;**
 - » the total cost is divided into units upon which fees are based (e.g., hectare or cubic metre);
 - » the WSP submits the proposed fee for the next year to the WUA board of directors or the general assembly of the WUA for approval;
 - » Sometimes the WUA rejects the initial proposal as being too high. In that case the President of the WUA must prepare and new budget and submit it again for approval
 - » If approved the water tariff becomes obligatory

Cost of water

- ◆ **The cost of water is different from the price of water although in many cases they coincide.**
- ◆ **Costs represent the monetary value of providing a service including the investment necessary to provide the service.**
- ◆ **The cost of water for a farmer is quite different to **the total costs to the society** which depend on economics evaluations.**
- ◆ **The price of any product normally includes the benefit of the seller. As water is often considered a public good the application of a “benefit” in the price is rare in irrigation but becomes common for domestic water .**

Unit 6.2

Calculation of the full water costs

Main components of the agriculture water tariffs

- ◆ **The full supply costs is made of two essential components:**
 1. **Recovery of capital costs** . Capital cost refer to the cost of major engineering works and replacement costs of the major equipment
 2. **Recovery of O&M costs.**
- ◆ **Most countries recover the total O&M costs but few recover the **total** capital costs. Normally a large part **of** the capital costs is subsidized by governments.**
- 3. **Capital costs are recovered through the Water Use charge or River basin fee or water regulation fee (Spain) or similar taxes. They are paid separately from the O&M costs**

Example of calculation for capital recovery for different periods and types of interest.

Average cost per hectare	Period of recovery (Years)	Type of interest	Capital recovery factor	Annual rate (US\$/ha)
2772	25	0	1	110.9
2772	50	0	1	55.4
2772	75	0	1	37.0
2772	25	0.03	0.057	159.2
2772	50	0.03	0.039	107.7
2772	75	0.03	0.034	93.3
2772	25	0.06	0.078	216.8
2772	50	0.06	0.063	175.9
2772	75	0.06	0.061	168.5
2772	25	0.09	0.102	282.2
2772	50	0.09	0.091	252.9
2772	75	0.09	0.090	249.9

2. Recovery of O&M Costs

- ◆ **The typical components of the O&M charge of an irrigation and drainage system are:**
 1. **Operation** costs (mostly made of personnel costs, pumping costs ,)
 2. **Maintenance** costs (maintenance staff, machinery, materials, etc..).
*The maintenance component would also cover normally the expenditures made in the **drainage system** as well. In some projects they also cover **rural roads**.*
 1. **Administrative** costs (administration staff, office materials,)
 2. **General or overheads** costs (rent, telephone, electricity, etc.)
- ◆ **However other classifications are also used. For instance: variable and fixed costs. Fixed costs are those not dependent of the consumption levels (personnel, general expenses, some maintenance works). Variable costs are dependent of the consumption (energy, pumping costs, billing costs, etc..)**
- ◆ **National accounting systems may require to use types of accounts which are completely different from those mentioned above. Sometimes two systems of accountancy are required.**
- ◆ **Water users organizations may recover other costs such as:**
 5. Technical assistance to farmers
 6. Reserve or emergency fund

2. Recovery of O&M Costs (2)

- ◆ **O&M are variable from year to year and therefore charges for the forthcoming year should be estimated as accurately as possible.**
- ◆ **In theory all the O&M should be recovered but countries sometimes subsidize part of these costs in irrigation systems managed by the Government but never in the WUAs.**
- ◆ **The level of annual recovery of the O&M costs should never fall below 80%. When this happens the sustainability of the system is at risk.**

Reserve Fund (for emergencies and rehabilitation)

- ◆ A reserve fund charge has the purpose of being used in emergencies or to contribute to the rehabilitation or modernization costs.
- ◆ A reserve fund has only sense within the context of WUAs or other autonomous bodies that manage irrigation systems.
- ◆ Governments should encourage their formation by offering some incentives (matching funds for rehabilitation).
- ◆ It is normally assessed as 5- 10% of the other components of the tariff.

2. Example of Operation and Maintenance costs of an irrigation system

MAIN ITEMS				
Project area: 11500 ha				
	total costs (US\$)	Ha	US\$/ha	%
Operation Costs				
Gross Salaries of Operation staff	175822.2	11500	15.29	
Overtime	26986.7	11500	2.35	
<i>Total Operation costs</i>	<i>202808.9</i>	<i>11500</i>	<i>17.64</i>	27.97
Maintenance Costs				
Gross Salaries of Maintenance staff	71555.6	11500	6.22	
Weed cutting and herbicides(irrig. Canals)	25016.4	11500	2.18	
Removal of silting (Drainage canals)	5111.1	11500	0.44	
Maintenace of hydraulic structures	11080.9	11500	0.96	
Maintenance of the Dam	177089.8	11500	15.40	
<i>Total maintenance cost</i>	<i>289853.8</i>	<i>11500</i>	<i>25.20</i>	39.97
Administrative cost				
				0.00
Gross salary of director	16355.6	11500	1.42	
Salary of accountant	6542.2	11500	0.57	
Salaries of auxiliary staff (secret.guards, etc)	6133.3	11500	0.53	
Social charges	2044.4	11500	0.18	
Office supplies	1226.7	11500	0.11	
Photocopies	613.3	11500	0.05	
<i>Total Administrative costs</i>	<i>32915.6</i>	<i>11500</i>	<i>2.86</i>	4.54
General costs				
				0.00
Amortization of all equipmet	61333.3	11500	5.33	
All costs of cars	28622.2	11500	2.49	
All cost of O&M machinery	69511.1	11500	6.04	
All costs of motorcycles	31893.3	11500	2.77	
Office rent	6133.3	11500	0.53	
Unspecified	2044.4	11500	0.18	
<i>Total general costs</i>	<i>199537.8</i>	<i>11500</i>	<i>17.35</i>	27.52
TOTAL O&M COSTS	725116.0	11500	63.05	100.00

Unit 6.3

Types of water tariffs and payments

Types of water tariffs

1. **Area based:** a fix rate per hectare of the **farm or hectare irrigated.**
2. **Crop based:** a fix rate per hectare irrigated of a given crop. For each crop the rates may be different
3. **Volume based:** a fix rate per every cubic meter received
 - » Monoblock: the rate is fixed independently of the consumption
 - » By blocks of consumption: the rate is different for every block of consumption.
1. **Volume and area based:** Two terms tariff or binomic tariff (one term per hectare and another one by volume)
 - » Standard
 - » Income regulating
1. **Sale of water to other users (water markets).** Normally it is sold by volume but other forms are also possible. It normally includes the **benefit for the seller.**

1. Area based tariffs

- ◆ The charge is not related to the volume consumed and therefore **does not motivate farmers to save water.**
- ◆ It is normally applied to the number of hectares of the farm because this information does not need year updating. However, it does not guarantee that farmers will receive the water needed for the whole farm. Sometimes is applied to the actually irrigated land
- ◆ It is of very simple application and is the most popular in the world.
- ◆ Installing measuring devices in open canal systems is costly and rarely perform efficiently.

2. Crop based tariffs

- ◆ This tariff is somewhat an improvement of the area based tariff.
- ◆ High water consuming crops (like rice) pay several times more than lower consuming crops (wheat).
- ◆ If the charges are well proportionate with the crop consumptions it provides a **sound** social bases for payment as those using more water pay proportionally more.
- ◆ It is of easy application but requires **control of the area planted of each crop.**

3. Volume based tariffs

- ◆ Basically consist in the application of a **fixed rate per cubic meter** and therefore the payment is proportional to the volume consumed.
- ◆ As earlier said it can be:
 - » Mono-block: one single rate for all the water consumed.
 - » Several blocks of consumption. Different rates for different blocks of consumption
- ◆ The application of this tariff stimulates the reduction of water consumption but flow measurements are needed for its application.

4. Volume and area based tariffs

- ◆ **One part of the tariff is charged by area (hectare) and one per volume (often by blocks).**
- ◆ **They are generally considered as the most suitable type of tariff because it satisfies several important objectives:**
 - » Relates water consumption with the payment and therefore encourage savings.
 - » **It guarantees a fix annual income to the managing authority independently of the consumption.**
 - » It allows for a **more easy recovery of capital investments** through the area base component.

5. Water markets

- ◆ Water markets are active in quite a number of countries. They can be legal or illegal.
- ◆ Legal water markets are possible in countries where the user has a legal title for the water and part of his/her entitlement can be traded .
- ◆ Often legal markets require that users sell part (or total) of their entitlement to a government authority established for the purpose of regulating this trade (Spain, USA) .
- ◆ Many informal markets exist where water is traded according to the law of the offer and demand. Often they are not backed by legislation but by traditions.
- ◆ Also many illegal market transactions take place particularly in groundwater areas.
- ◆ Normally the price of selling includes a benefit for the seller.

Who should pay?

- ◆ Normally the **owner of land is responsible** for the payment of water tariffs.
- ◆ It is becoming more widely accepted that the **“user” (renters) should pay**. This provides a better opportunity for the actual users (women and men) to pay for the water that they use. However renters should be authorized by the owners.
- ◆ This practice should be reflected in the regulations of the WUAs.
- ◆ There is a long debate over if very poor farmers should pay for water or what level of subsidy should be applied. **Reference to “capacity to pay”**

How to prevent financial irregularities

- ◆ **Financial irregularities and corruption are the largest threats to successful WUAs. The following are some good practices to reduce this risk:**
 - » **Payment against received water service has proven to be very effective.**
 - » Training on agreed financial practices for the treasurer and accountant are needed
 - » Financial transactions need a minimum of **two signatures**
 - » Financial records should be available to farmers
 - » **Special committees should be set up to verify periodically the correctness of financial transactions**
 - » Very clear rules should be established for determining water fees
 - » External financial auditors should be used to periodically examine accounts
 - » The treasurer should be replaced periodically

When tariffs should be collected?

- ◆ There is **no fixed rule**. However it has proven to be very effective to request payments **before each irrigation delivery**.
- ◆ However payments are also frequently requested **before the irrigation season starts** (to provide cash for the operation).
- ◆ Making **payments small** (every month, i.e.) makes easier the payment for small farmers.
- ◆ Obviously in the case of volumetric tariffs the payment must be billed after consumption assessed.
- ◆ Use of payment cards is becoming **a** practical method of payments in some European countries (Spain, Italy).

Where the collected money goes?

- ◆ **The money collected for the recovery of the capital investments should go back to the central government so that it can be used for other new developments.**
- ◆ **The money collected for the recovery of the O&M should remain in the irrigation system where it was collected.** However this is only true for WUAs. In irrigation systems managed by the government the money returns to the central treasury and there is no guarantee that the collected money will return to the irrigation system where it was collected.

Making payments

- ◆ In the prevailing cash economy of our societies **payment in cash is becoming the predominant** type of payment.
- ◆ However, in many irrigation systems the payments **in kind and labour** are very common (particularly in Asia).
- ◆ A combination of cash and labour is very common in many irrigation systems. **Labour for maintenance**
- ◆ **Payments in kind can be:**
 - » A percentage of the crop
 - » A fix amount of the crop (independent of production)
- ◆ **Payment against received water service has proven to be very effective.**

Relation between volumetric charging and consumption

- ◆ The economic law of the offer and the demand implies that **high prices of any commodity should lead to a reduction of the demand and vice versa.**
- ◆ The water demand curves are the amount of water that the farmers will use for different values of the water fees.
- ◆ In practice this economic theory holds true when the water fees are high but for lower fees the irrigation water farmers do not change their habits of using water . The reason being that actual irrigation low water charges have little impact in the crop benefits and farmers care only about the price of water when they are very high.
- ◆ This slow reaction to prices is known in economic terms as water being an “inelastic commodity”.

Types of tariff (examples)

Examples of different types of tariffs (1)

One term tariff	Payment	Unit
A. Tariff by area		
Recovery of investments (3% interest, 25 years)	159.2	US\$/ha
Recovery of O&M costs	65.91579	US\$/ha
Total Tariff by hectare	225.1158	US\$/ha
B. Tariff by volume		
Estimated annual average water consumption	15000	m ³
Total recovery costs	225.1158	US\$/ha
total Tariff by volume	0.015008	US\$/m ³

These components are generally paid separately

Examples of tariff

Examples of different types of tariffs (2)

Two terms tariff (binomic)	Payment	Unit
C. Tariff with two terms Standard		
1. Area component (recovery of investments)	159.2	US\$/ha
2. Volume component (15000 m ³ /ha)	0.004394	US\$/m ³
D. Two terms tariff with 30% of O&M expenditures included in the surface component		
Area component (recovery of investments)	159.2	US\$/ha
30% of O&M expenditures	19.77474	US\$/ha
1. Total area component	178.9747	US\$/ha
2. Volume component (70% of O&M costs)	0.003076	US\$/m ³

Thank you for your attention !