Cost recovery or the water economic cycle

Scope of cost-recovery analysis

The concept of cost recovery is explicitly mentioned in the WFD. Cost-recovery analysis must be carried out in the process of drafting the characterisation report for each river-basin district. A more simplified form of the analysis may also be carried out for an SBMP. The results can serve as true decision-aid tools in that they facilitate debate and inform on the economic issues in the area covered by the SBMP.

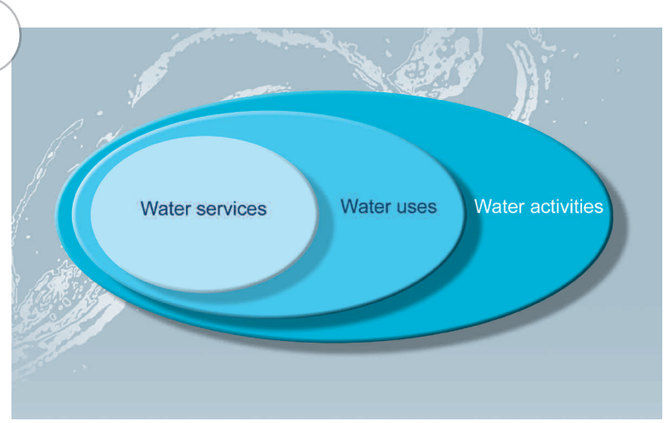
WFD article 9 requires that cost recovery be analysed in each river basin:
"Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs, having regard to the economic analysis conducted according to Annex III, and in accordance in particular with the polluter pays principle."

The objective being that water users cover as much as possible the costs incurred by their use of water, primarily through the price paid for that water,. The analysis must therefore indicate the degree to which each category of water-service users in fact pays for the water it consumes and discharges. The directive does not set a specific level of cost recovery. It provides the Member States with a certain degree of leeway, notably by providing the possibility of taking into account the social, environmental and economic impacts of cost recovery.

Definition of water services

The 22 April 2004 instructions concerning the analysis of water tariffs and cost recovery of services, in compliance with WFD article 9, provides in their Annex I definitions of the terms "water activities", "water uses" and "water services".
The three sets of items are nested, as shown in Figure 32.

Figure 32

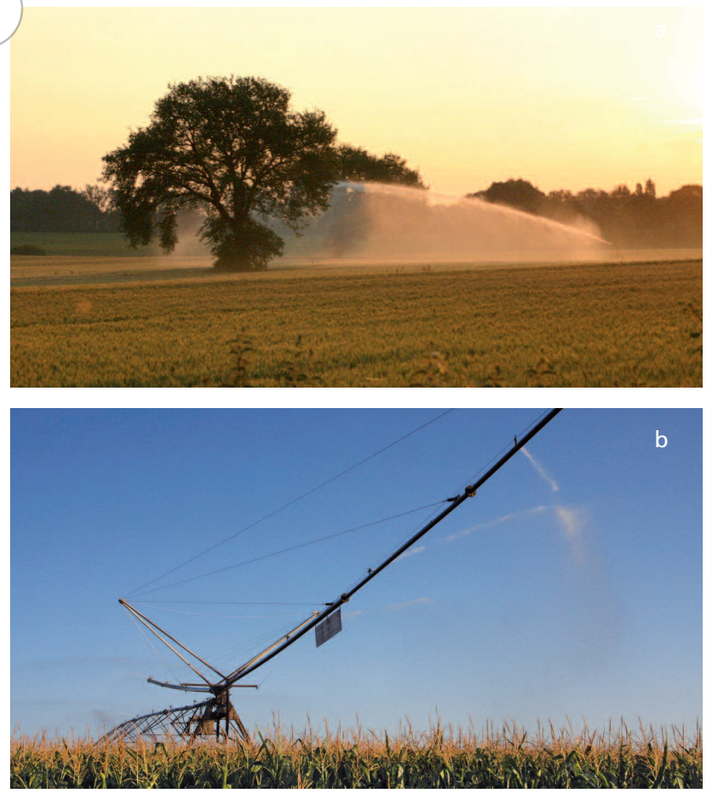


Water services. Source: Wateco guide, p.74.

■ Water activities

"The largest set is that of water activities." This may include, for example, bathing, irrigation (Figure 33), water distribution, fishing, etc.
By characterising water activities in a river-basin district, it is possible to determine their economic importance, as seen in the previous chapter.

Figure 33



a- b © M. Bramard - Onema

Irrigation is an example of a water activity.
(a) Sprinkler irrigation system for crops. (b) Irrigation via a central-pivot system with drop sprinklers.

■ Water uses

Water uses include *"services"* defined by WFD article 2-38 and other activities *"having a significant impact on the status of water"* (art. 2-39). They are identified in WFD Annex II (sections 1.4 and 2.1).

■ Water services

Water services are characterised by the existence of installations for water abstraction, storage, treatment and discharge (see Figure 34).

"The notion of "service" est extensive because it implicitly includes, absent any contrary indications in article 2-38, public and private services for third parties or for the provider itself, characterised by the presence of installations (abstraction, storage, discharge) and likely to influence significantly the status of water bodies."

WFD article 2-38

"*Water services*" means all services which provide, for households, public institutions or any economic activity:

- (a) abstraction, impoundment, storage, treatment and distribution of surface water or groundwater,
- (b) waste-water collection and treatment facilities which subsequently discharge into surface water.

The French position, presented in the 2004 instructions, was therefore to take into account in the analysis both public and private services for third parties or for the provider itself, likely to influence significantly the status of water bodies.

Figure 34

a © B. Gentil - Onema
b © C. Roussel - Onema

Wastewater-treatment plants and water towers are two infrastructure facilities included within the scope of cost-recovery analyses on the costs of water services.
(a) Wastewater-treatment plant.
(b) Water tower.

Definition of the economic sectors using water services

The WFD requires an assessment of cost recovery for water services whereby the data are "disaggregated into at least industry, households and agriculture".

In addition to these three user categories mentioned by the WFD, it was decided in France to more precisely distinguish within the industrial sector by adding the "quasi-domestic production activities" category. This category includes small shops, services and SMEs whose consumption is fairly similar to that of households. Practically speaking, however, this economic sector is closer to industry than to households.

Taking environmental impacts into account

Finally, the WFD requires that environmental benefits and damages be taken into account:

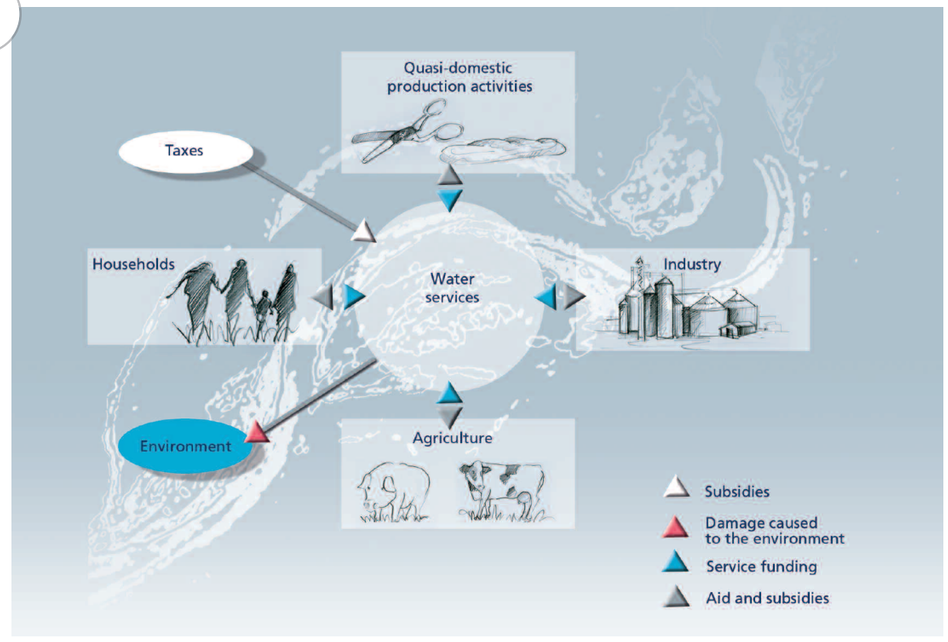
*"Member States shall take account of the principle of recovery of the costs of water services, **including environmental and resource costs,** having regard to the economic analysis conducted according to Annex III, and in accordance in particular with the polluter pays principle."*

For this reason, the environment must also be included in the cost-recovery analysis.

Service funding provided by taxes must also be listed.

Cost-recovery efforts therefore consist of identifying and assessing the economic flows between six stakeholders, as shown in Figure 35.

Figure 35



Drawings by Béatrice Saurel

Economic flows between water stakeholders. Source: Maria Salvetti, using work produced by the Forecasting and assessment department of the Seine-Normandie water agency.

Relevant costs for the analysis

The costs that must be assessed and taken into account for cost-recovery calculations are the following:
- capital costs, themselves made up of depreciation (the funds required to rebuild installations), new investment and opportunity costs, i.e. the benefits that could have been drawn from using the capital for another purpose;
- maintenance and operating costs;
- environmental costs which correspond to the market and non-market damage incurred by environmental degradation caused by the services;
- resource costs, i.e. a quantification of the costs borne by other services due to the over-use of the resource by the service in question.

Capital costs may be estimated fairly easily. It should be noted, however, that due to significant difficulties concerning the methods employed, capital opportunity costs are not included in calculations for cost recovery for the time being.

Assessment of the environmental costs also raises problems in terms of the methods. In general, they are roughly calculated using the compensatory costs, which however constitute only a part of the environmental costs.

An example of calculating the compensatory costs of a water service

Included in the maintenance and operating costs, as well as in the depreciation, are "compensatory" costs which correspond to the expenses assumed by the service for environmental degradation caused by other users. For a drinking-water service, these compensatory costs correspond, for example, to the installation of additional treatment processes made necessary by pollution of untreated water by other services and activities.

Purchase of bottled water by consumers confronted with poor-quality tap water caused by resource degradation must also be seen as compensatory expenses borne by households.

For a given service, the resource costs correspond to the expense incurred by the resource use exceeding the desirable level for the collectivity as a whole. In other words, it corresponds to the surplus that could have been achieved by the user making the best alternative use of the resource.

For example, the opportunity cost of an irrigation service compared to an industrial-water service may be roughly calculated by the losses in industrial production if the water is allocated for agricultural use. The opportunity cost of an irrigation service compared to a drinking-water service may be roughly calculated by the losses borne by the town or local government in acquiring water from a more distant location.
The opportunity cost of industry and towns compared to agriculture may be estimated on the basis of the lost agricultural income.

Given the difficulties in aggregating compensatory costs over an entire river basin, it was decided not to include them for the time being in calculations of the complete cost of services.

10 Calculating cost recovery

Once the scope of the analysis has been determined, cost-recovery calculations consist of identifying and estimating all the economic flows involved in water services. The overriding purpose is to provide economic information on water-management issues identified by the characterisation report for the river basin.

With that in mind, the WFD does not require complete cost recovery, but transparency concerning costs must be ensured. To that end, Member States must:
- take into account the principle of cost recovery (art. 9.1.);
- ensure by 2010 "adequate contribution of the different water uses, (...) to the recovery of the costs of water services, based on the economic analysis conducted according to Annex III and taking account of the polluter pays principle";
- assess "the contribution made by the various water uses to the recovery of the costs of water services" (art. 9.2.).

Practically speaking, the objective is to report on:
- the value of investments and how they are funded for each type of service;
- operating, depreciation and maintenance costs and how they are funded for each type of service;
- the contributions of the various economic sectors to funding of services and the subsidies granted.

Following the calculations, the ratios and economic flows listed below must be estimated:
- percentage of service costs (operating, maintenance and depreciation costs) covered by water prices;
- origin of water-sector funding (public subsidies and/or subsidies from the various economic sectors);
- cost recovery for the environment and water resources in application of the polluter-pays principle.

Assessment of service investments and how they are funded

For each type of service, the volume of investments and subsidies must be determined, taking care to distinguish subsidies funded by environmental fees and those by taxes. It is also necessary to assess any "compensatory" investments, i.e. investments undertaken due to the degradation in the quality or quantity of water resources. This may be the case, for example, of network interconnections, of reinforced treatment of drinking water due to eutrophication, to the presence of nitrates, pesticides, of changes in the position of abstractions, etc.
Table 18 presents a selection of the main compensatory costs and indicates whether they are curative, palliative, preventive, administrative (borne by the State and local governments) or for health purposes.

Tableau 18 *Type of compensatory costs.*
Source: Onema study, "Analysis of compensatory costs", 2011.

	Type of cost				
	Curative	Palliative	Preventive	Admin.	Health
Consequences following discharge of maritime waste (cleaning, health costs, etc.)	X				X
Increased pumping due to drops in groundwater levels	X				
Cleansing of shellfish following microbiological contamination	X				
Treatment of shellfish following chemical contamination	X				
Shellfish protection and detoxification following algal bloom	X				
Additional treatment of polluted water (mainly for the food industry)	X				
Maintenance of waterways and facilities	X				
Treatment of stored water if eutrophication (DWSS - drinking-water supply and sanitation)	X				
Additional treatment of eutrophication in water (DWSS)	X				
Additional treatment of water polluted by nitrates (DWSS)	X				
Additional treatment of water polluted by pesticides (DWSS)	X				
Mixed waters (DWSS)	X				
Restoration of treatment facilities following accidental pollution	X				
Restoration of wetlands and aquatic zones for recreational fishing	X				
Restocking for recreational fishing in fresh waters	X				
Management of oil spills	X				
Management of sediment contaminated by PCBs	X				
Relocation of shellfish farms		X			
Replacement of water resources to water livestock		X			
Purchase of spat		X			
Relocation of freshwater commercial fishing activities		X			
Replacement resources from reservoirs and dams		X			
Replacement resources from new abstractions		X			
Replacement resources (drinking water used by food industry)		X			
Creation of network interconnections (DWSS)		X			
Deeper wells and related treatments (DWSS)		X			
Replacement resources through desalination of seawater		X			
Replacement sources (tanks and bottles) following anthropogenic degradation		X			
Relocation of recreational activities to another, non-degraded site		X			
Rescue fishing when rivers run dry or following modification of hydraulic conditions in rivers		X			
Reinforced monitoring of water quality when thresholds are overrun (DWSS)			X	X	
Subsidies to change farming practices in abstraction supply zones (ASZ)			X		
Subsidies to change plant-protection practices by public or economic stakeholders in ASZs			X		
Incentives to change plant-protection practices by households in ASZs			X		
Protection of abstractions (land purchases outside of well-protection perimeters)			X		
Reinforced monitoring of water quality when thresholds are overrun (resources used by food industry)				X	
Administrative costs incurred for management of accidental pollution (DWSS)				X	
Administrative costs incurred by "green tides"				X	
Administrative costs incurred by oil spills				X	
Decisions to forbid harvesting and sale of seafood and freshwater products if contaminated				X	
Decisions on water use during dry periods and monitoring (central government)				X	
Reinforced monitoring of water quality when thresholds are overrun (recreation and consumption)				X	
Administrative costs incurred in managing PCB pollution				X	

Figure 36

a- b © C. Roussel - Onema

(a) and (b). Protection of a drinking-water abstraction.

Assessment of current expenditure for services and how it is funded

Current expenditure of services consists of operating expenses and depreciation. For each type of service, current expenditure and revenues must be assessed not including VAT and environmental fees, the latter being accounted for in the expenses of the various economic sectors.

The cost-recovery ratio is then calculated by comparing:
- expenses incurred by services (operating expenses and depreciation);
- revenues (billing volumes and operating subsidies).

Autonomous services that do not receive operating subsidies may produce a 100% cost-recovery rate.

For collective water and sanitation services (see Figure 37), it is also necessary to distinguish between subsidies financed by water prices, e.g. water-treatment fees collected by the Water agencies, and those financed by taxes, e.g. balancing subsidies.

In addition, the study must assess the costs incurred by the construction of facilities made necessary by resource degradation. It should be noted that the current expenditure in conjunction with the compensatory investments are already accounted for in the operating expenses of the service.

Figure 37

a- b © M. Carrouee - Onema

Cost-recovery analysis targets primarily public water and sanitation services.

The expenses of public sanitation services also include expenses for rainwater management, a responsibility of towns. This means that it is necessary to calculate the economic flows for rainwater management between service users and taxpayers.

Rainwater expenses
Description of economic flows between service users and taxpayers

Management of rainwater is the responsibility of towns and must be assumed by their budgets. In general, however, rainwater management is taken over by the collective sanitation service and booked in its subsidiary budget.

Local governments having a combined sewerage system must then contribute to recovery of the expenses booked in the sanitation-service subsidiary budget (for those having a subsidiary budget), on the basis of a percentage set by the local government, in compliance with ministerial instruction dated 12 December 1978. This contribution is booked to account 7 063 "contribution of local governments", an account created specifically for this purpose.
However, the amount booked to account 7 063 is rarely indicative of the actual costs incurred by rainwater management because local governments do not necessarily reimburse sanitation services in full for the outlays.

The difficulty for local governments having separate collection systems lies in identifying and distinguishing the expenses pertaining to rainwater management. These expenses must be booked in the municipal accounts and assumed by the general budget.

In the 2012 cost-recovery analysis using 2009 data, the cost for management of combined sewerage systems was estimated on the basis of the revenue listed in the subsidiary budgets (account 7 063 mentioned in the M49 accounting instructions), i.e. 192 million euros.

This amount corresponds to the minimum value reimbursed by local governments to sanitation services to cover the costs of rainwater management. This calculation serves to estimate the economic transfer between taxpayers and users of sanitation services.

Source: Cost-recovery analysis, 2009, Ernst and Young for IOWater.

a © M. Carrouee - Onema
b © O. Leroyer - Onema

Gutters serve to collect rainwater and catch basins retain excess water.
(a) Gutter. (b) Catch basin.

Assessment of the contributions of the economic sectors using the services

After assessing the outlays of services and how they are funded, it is necessary to calculate the contributions of the various economic sectors. This step in the analysis answers the question of "Who pays what" (see Table 19).

At this point, it is necessary to take into account:
- the contributions of the different categories of users to the funding of collective water and sanitation services;
- the contributions of the various economic sectors to funding of subsidies for water services, taking care to distinguish funding from taxes and funding via environmental fees;
- environmental and water-resource costs borne by the economic sectors.

Table 19 shows an example of the breakdown of the contributions from the various sectors to service funding.

The work consists of noting the total amounts (represented here by letters) of expenses, of subsidies and of the environmental costs borne by each category of user.

Tableau 19 *Example of a table summing up the cost-recovery data.*

	Households	Productive activities	Industry	Agriculture
Contribution to service funding, in euros	A	D	G	J
Contribution to funding of subsidies for services, in euros	B	E	H	K
Environmental and water-resource costs, in euros	C	F	I	L