



# Regional workshop on economic analysis related to RBMP development

**Kyiv, March 27<sup>th</sup> 2019**

2- Objective and information needed related to economic analysis to complete the development of a financially balanced the program of measures



# Economic analysis and RBMP design

*annex 7 of the WFD and CMU Decree 18 May 2017 on River Basin Management Plan.*

- River Basin Characterisation
- Pressures and impact of human activities on water resources

Article 5: economic analysis of water use

Article 9: recovery of costs for water services

- Identification and mapping of protected areas

Article 6: register of protected areas for the protection of economically significant aquatic species

- Monitoring programme

- Environmental objectives

- Heavily Modified WB

Article 4: analysis of disproportionate costs

- Programme of measures

Article 11: develop cost recovery

= River Basin Management Plan for 6 years cycle adapted to **social and economic issues** revealed through **economic analysis**



# Program

## 1) The measures

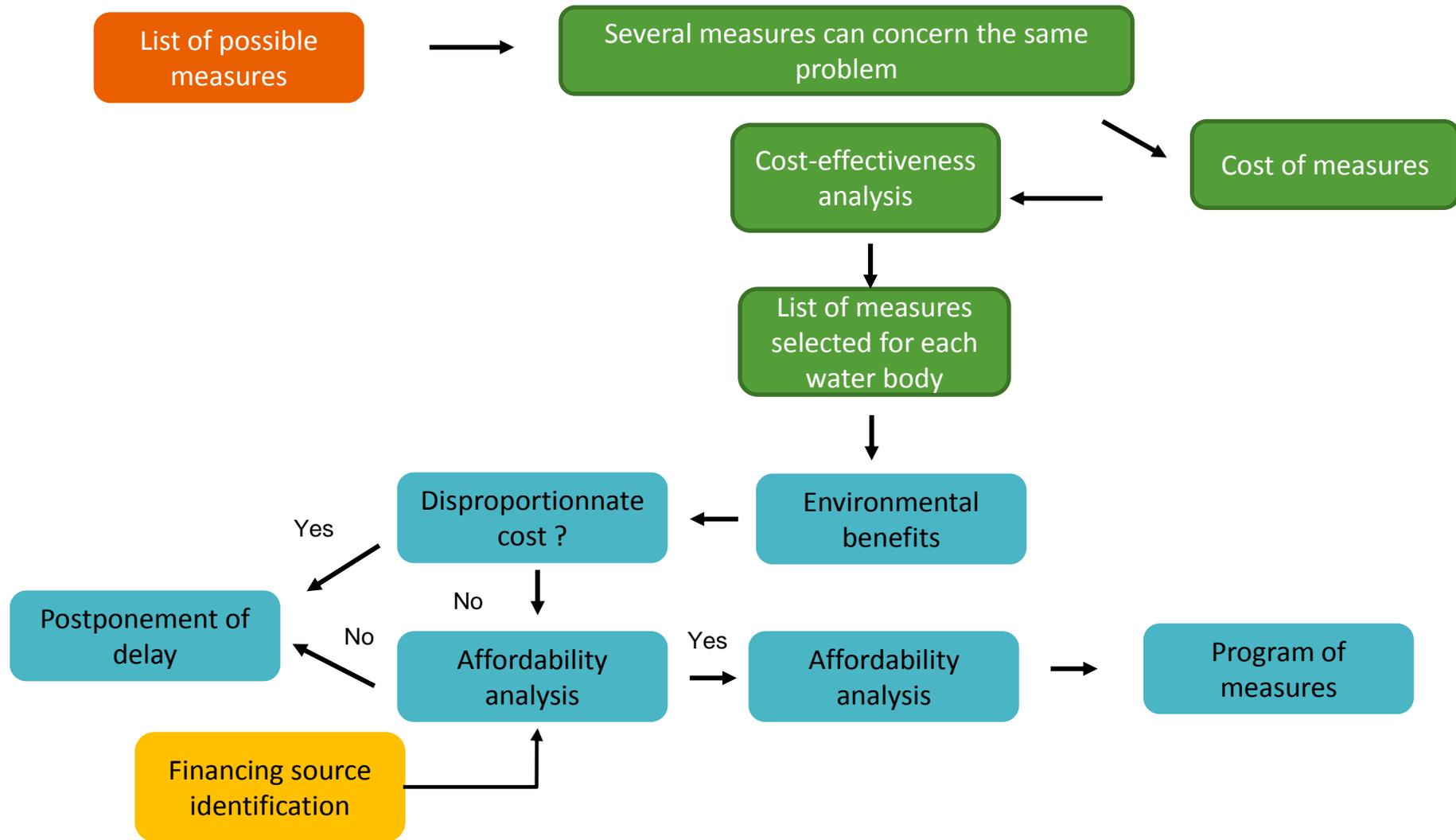
- costing
- cost-effectiveness analysis
- financing source identification

## 2) Balancing the proposed programme of measures :

- cost-benefit analysis
- affordability analysis



# The steps of economic analysis



# How choice the good measures ?

With the characterization step, you are able to identify the water bodies which are not in good status

- Which measures can be applied to improve the water quality?
- How to choose between several measures? Which indicator is relevant? Financial? Environmental?



# Identify measures and quantify them

For each topic (agriculture, drinking water, sanitation ...) it will be necessary to identify the measures that can be implemented and to associate costs. These costs may be:

- ❑ Investment costs,
- ❑ Studies,
- ❑ Annual operating costs,
- ❑ Other costs: allowances paid ....

=> The costing will have to be evaluated during the implementation period of the program

Measures have to be adapted to future pressures (**baseline scenario** is needed)



# Identify measures and quantify them

For example :

to improve wastewater discharges, consider building a purification plant. This measure involved :

- A study : 20 000 €
  - The construction of the treatment plant : 700 000 €
  - Operating costs : 20 000 € / year
- ⇒ The cost of this measure over the period 2020-2026 is :
- $$20\ 000\ € + 700\ 000\ € + (20\ 000 \times 7) = 860\ 000\ €$$



# Identify measures and quantify them

Sometimes, not always, there are several measures that can be implemented for a similar goal. So you must choose between these measures in order to select only one : the one which is the most efficient at the least cost !

## The cost-effectiveness analysis



# The cost-effectiveness analysis

The status of water bodies is not good



Which measure can be applied to improve it?

Measure	Cost	Effectiveness (improvement of water quality)	Cost / effectiveness in K€
A	1 000 K€	4	250
B	1 300 K€	3	433
C	800 K€	3	267



# Financing source identification

It's important to determine how the measures can be financed :

- Who are the potential funders?
- What are the types of financed measures?
- What are the usual financial support rates?
- What is the nature of the financial support (grant or repayable advance or loan)?

Total cost can then be splitted into:

- Net cost for the stakeholders
- Aids from the various funders

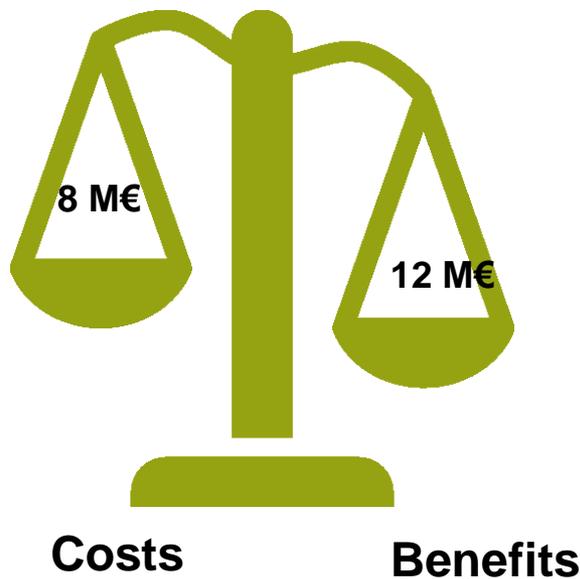


# Questions and discussions

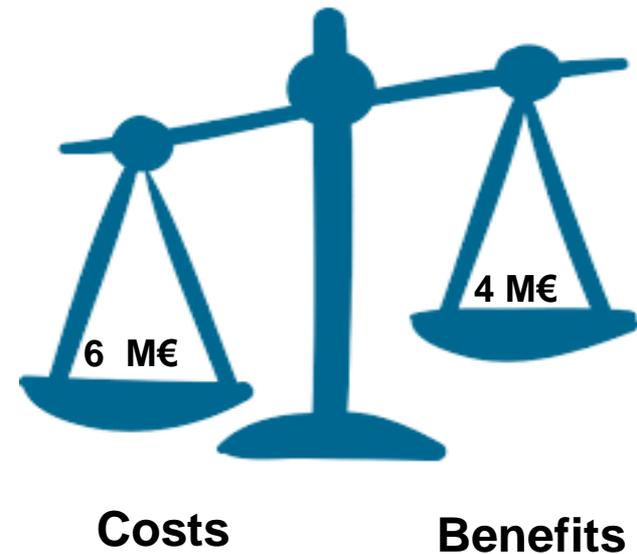


# Cost-benefit analysis

- To do what? To estimate if the measure provides enough environmental benefits => **is it worth it?**



The cost isn't disproportionnate



The cost is disproportionate



# Cost-benefit analysis

In its **Article 4**, the Water Framework Directive (WFD) allows Member States to justify to the European Commission a less strict objective or a postponement of delay for a water body that does not reach the good state according to certain criteria.

⇒ **Disproportionate cost** is one of those criteria.

There is currently no single method for determining whether the cost of a project is disproportionate. The costs can be compared to different elements to identify the disproportionate nature of an action.



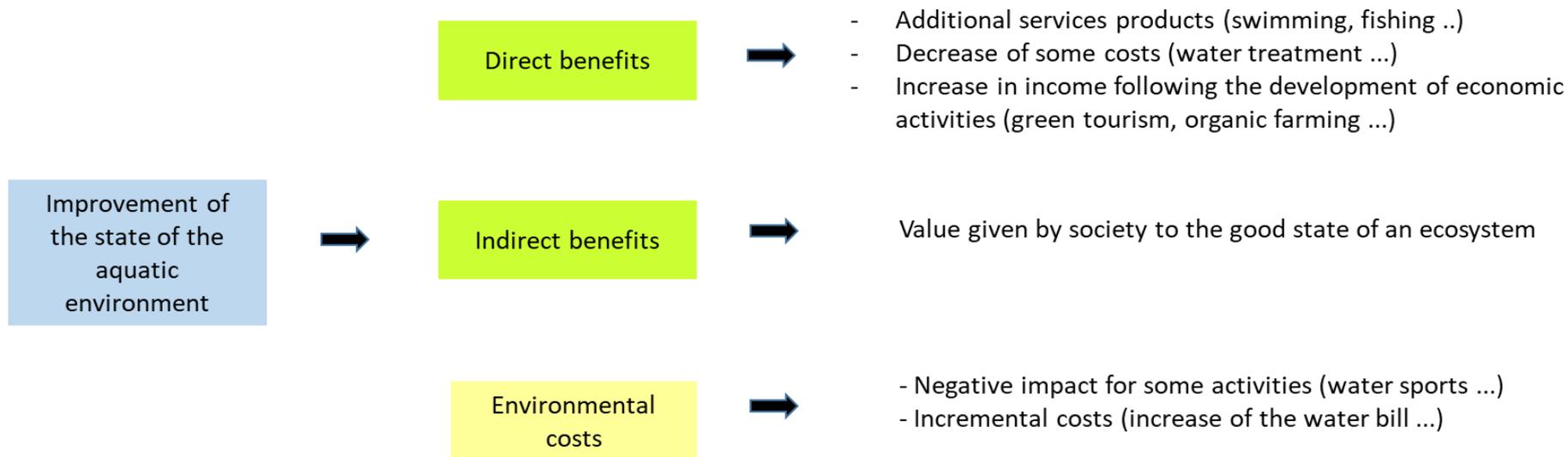
# Cost-benefit analysis

- Comparing two scenarios : usually baseline scenario (business as usual) and scenario with RBMP, both integrating future trends
- Difference with water uses characterisation
  - Water uses characterisation : describing observed situation
  - Cost benefit analysis : comparing two potential situations
- Costs of baseline scenario that are avoided in RBMP scenario appear as benefits



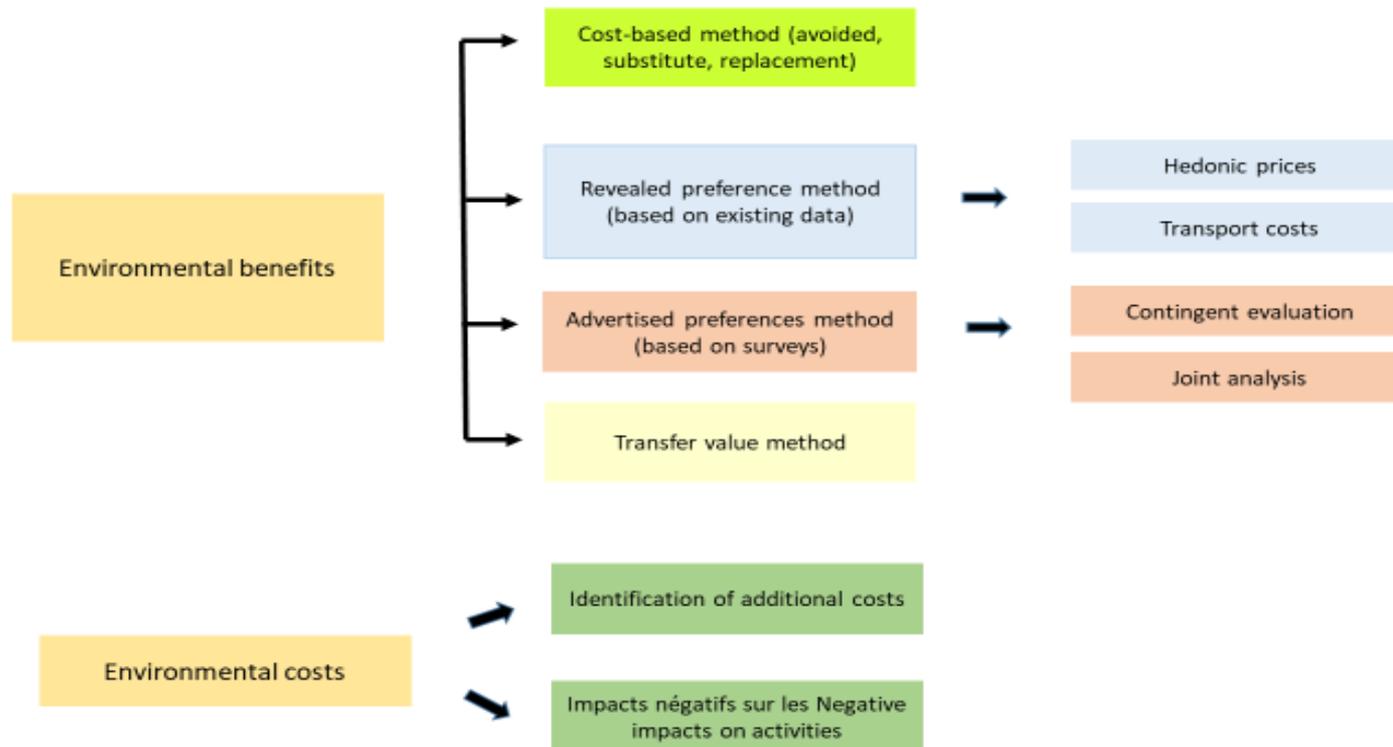
# Cost-benefit analysis

## ■ Environmental benefit? What is it?



# Cost-benefit analysis

## ■ How to estimate the environmental benefit?



# Cost-benefit analysis

- An example on a water body within the Loire Bretagne river basin

Measure	Cost of measures - in euros - on 2016-2021	Annual cost of measure - in euros	Cost of measurements updated over 30 years - in euros
Agriculture	22 903	1 909	57 258
Sanitation	30 089 000	2 507 417	30 089 000
Government	1 474	123	1 474
Aquatic environments	84 418	7 035	84 418
Water resource	2 200	183	2 200
Industry, collectivity and waste	0	0	0



# Cost-benefit analysis

- An example on a water body within the Loire Bretagne river basin

Type of benefit		Reference value	Amount in euros
Avoided treatment costs	Lower treatment costs for oyster farming	0,08€ 2012 / kg oyster	3 245 499 €
Use value associated with recreational activities	Non-market benefits of current swimmers	35,4 €/ swimmer / year	215 247 €
	Non-market benefits of current occasional practicing kayakers	8,7€ 2012 / household / year	136 668 €
	Non-market benefits of current regular practicing kayakers	39,7€ 2012 /kayaker / year	92 843 €
	Non-market benefits of current recreational fishermen	39,7€ 2012 /fisherman / year	148 549 €
	Non-market benefits of current walkers	39,74€ 2012 /household / year	836 432 €
	Non-market benefits of current water sports	26,1€ 2012 /visit / year	1 220 762 €
	Non-market benefits of current foot fishermen	28,44€ 2012 /household/ year	106 417 €
	Non-market benefits of current windsurfers	5,6€ 2012 /household/ year	13 096 €
Heritage value	Heritage value (non-use)	27,4€ 2012 /household/ year	166 604 €
	Supply of drinking water by surface water	39,7€ 2012 /household/ year	1 132 689 €
<b>Total</b>			<b>7 314 806 €</b>



# Cost-benefit analysis

- An example on the Loire Bretagne river basin

The benefit / cost ratio is 0.24

=> the cost of the measurement program for this water body is considered **disproportionate**.



# Affordability analysis

- For water bodies for which the cost of the measures is not disproportionate, it should be verified that the economic actors will be able to bear these costs.
- To do this, it is necessary to deduct from the costs of the measures the aid or subsidies paid by the public funders. The remaining cost to the actors (taxpayer, consumer, farmer, industrial ...) will then be related to adapted financial indicators different from one actor / user of water to another. It will thus be possible to assess whether the cost of the measures is economically bearable by the actors.



# Affordability analysis

Actors	Indicators	Threshold value
Household	Water price	The price of water is over 3% of household income
Agriculture and industry	Gross operating surplus	Increase of 2 to 3%
Municipality	Local taxes	Increase to be considered for each tax



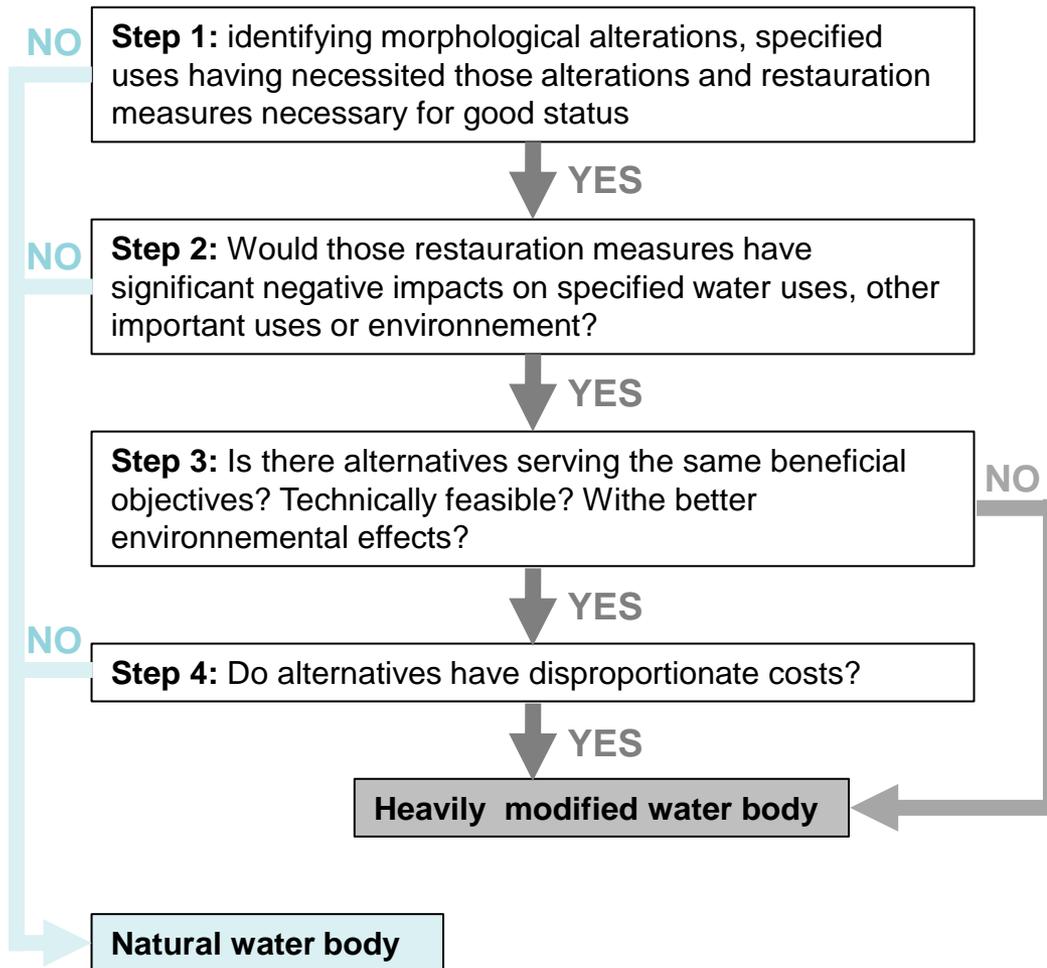
# Affordability analysis

- An example from a French water body :
  - Annual cost of investment (Annuité) and operation (Fonctionn.) => total cost per year **without aids** for each **category of stakeholders** (Industry, Municipalities, Water services, Housholds, Agriculture)
  - 1 ratio per stakeholders category : **Ok** for industry, **severe** for municipalities and water services, **too high** for households and agriculture

Coût annuel pris en charge			Catégorie d'acteurs	Ratio de référence	
Annuité	Fonctionn.	Total		Définition	Valeur
1 668 019	644 000	2 312 019	Industriels	Coût annuel Indus / VA Indus	0,12%
352 898	0	352 898	Collectivités/Bgal	Coût annuel BGal / Potentiel fiscal	2,0%
808 845	239 250	1 048 096	Collectivités/Eau	Facture d'eau / Revenu	2,6%
5 076 579	1 960 000	7 036 579	Ménages	Coût annuel ANC / Revenu ANC	6,39%
168 356	3 099 785	3 268 141	Agriculteurs	Coût annuel Agri / VA Agri	3,6%



# Heavily Modified Water Bodies (HMWB)



- **Technical base:** morphological alterations, water uses causing those alterations, measures for good status
- **Economics:** determining if significant impacts on activities
- **Technical base:** assessing alternatives feasibility and environnemental effects
- **Economics:** estimating costs and benefits of possible alternatives => affordable? disproportionate?



# HMWB, significant impacts

- On specific uses (having necessitated water body heavy modification) or a wider environnement (high value habitats, specific landscape)
- Simple descriptive methods if measures largely prejudice the viability of: navigation channel with important traffic, flood protection for important settlement, important natural zones
- For more balanced cases, comparison of costs for impacted uses and potential benefits



# Cost recovery

- You must verify that the cost recovery for water services is not deteriorated by the RBMP.
  - Recovery rate before the RBMP (article 5)
  - Recovery rate with the RBMP

**=> If the rate decreases, you must review the planned measures**



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# Thank you for attention

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