

“Workshop “Program of Measure under the Water Framework Directive”

20 – 22 June 2016

ECRAN 62432

**Presentation of case studies on
cost effectiveness analysis, cost recovery, cost benefit analysis**



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Structure of the presentation

Cost effectiveness

Case studies cost recovery

Case study cost benefit analysis



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Cost-effectiveness and the Programme of Measures (1)

The programme of measures is the central element through which the WFD objective of good status should be reached.

Article 11 WFD requires that programmes of measures have to be established for each river basin district by 2009 at the latest, and that the measures contained therein have become operational by 2012.

Article 11 further distinguishes between “basic measures” and “supplementary measures”, where the former include the minimum requirements to be complied with, such as the implementation of measures that were already required by previous European water legislation. “Supplementary measures”, by contrast, are those measures required in addition to the minimum requirements, in order to achieve the objectives of the WFD.



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Cost-effectiveness and the Programme of Measures (2)

While there is no mentioning of costs or benefits in Article 11, Annex III of the WFD introduces the additional specification that the programme of measures should include the “most cost-effective combination of measures in respect of water uses.”

Thus, while the WFD does not require the use of a cost-effectiveness analysis as such, it does require that the programme of measures should be cost-effective.

It is generally understood that a cost-effectiveness analysis, or a comparable procedure, should precede the establishment of programmes of measures, in order to ensure that the WFD objectives are reached at least cost.



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Cost-effectiveness and the Programme of Measures (3)

- Article 11 does not require that the selection of measures should be guided by cost-benefit comparisons, nor that programmes of measures should pass a cost-benefit test. In general, monetary valuation studies will therefore not play any significant role in this process.
- As the programmes of measures under Article 11 are the central vehicle for achieving the WFD objectives, they also include measures to comply with requirements established by other Articles of the Directive.
- Thus, for example, they will also include measures that contribute to cost recovery and incentive pricing, as required by Article 9 WFD.



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Cost effectiveness analysis (1)

Why we need to assess the cost-effectiveness of potential measures for achieving the environmental objectives set out in the WFD?

- Making judgements about the most cost effective **programme of measures** which could be implemented in order to bridge a potential gap in water status between the baseline scenario and the Directive's objectives ;
- Assessing the cost-effectiveness of **alternative measures** in order to estimate whether those programmes of measures are **disproportionately costly or expensive**



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Cost effectiveness analysis (2)

Costs and **effects** on water of the measures should be fully assessed by focusing on the largest cost components and the major determinants of the effectiveness of measures.

What question we should answer ?

- 1) CEA based on financial costs (as a proxy for economic costs) and estimates of water environmental costs;
- 2) CEA based on economic costs, including estimates of non-water environmental costs ;
- 3) CEA effectively being expanded to a **CBA, including wider economic costs and benefits**



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Cost effectiveness analysis (3)

Cost Considered in the CEA		
Actual cost of measure	Economic cost of measure	Definition Term
(Direct) financial cost of measure	Adjust for taxes and subsidies if any	Direct, indirect, maintenance, and operating
+ associated water @ non-water environmental costs of measure ???	WTP to avoid damage WTP – willingness to pay	Non-water environmental costs
= Total cost	= Total social cost = Total economic cost	



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Cost effectiveness analysis (4)

CEA/CBA will sustain the decision-making process

Development the Program of measure & Prioritization of measures

- Transparency to stakeholders/public/EC, allowing consultation and experience exchange
- Stakeholders acceptance



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Cost effectiveness analysis (5)

Different scale for CEA assessment :

- CEA to compare individual measures
- CEA of measures grouped per descriptor/indicator/pressure reduction - measures may be combined or mutually exclusive
- CEA of various PoM scenarios:
 - To balance measures targeting various descriptors/indicators + addressing significant pressures



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Cost and Benefit Analysis

The analysis of **costs and benefits** remains in most cases the basis for **deciding on cost disproportionality** and implicitly on exemptions (WFD)

It is important to see in which proportion the total costs of PoM related to different economic sectors could be considered disproportionate ? (which is the threshold for disproportionality)

Questions:

- whether social and distributional impacts, including ability to pay should be considered or not in the justification for exemption due to disproportionate costs;
- whether distributional impacts on the public budget should also be considered, as the public budget might have its own constraints and limitations (cost recovery, EU rules on budgetary deficit,...) that might hamper the implementation of measures.



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CBA approach for WFD in Romania

- Qualitative & Quantitative approach
- A standard environmental benefit template was developed for supplementary measures (WFD)
- Each supplementary measures was assessed in relation with standard environmental benefit template
- Only for supplementary measures related to **Nutrients pollution, organic and hazardous substances from human agglomeration and industry point pollution** sources a direct benefit analyse (cost – income) was assessed based on **NPV**



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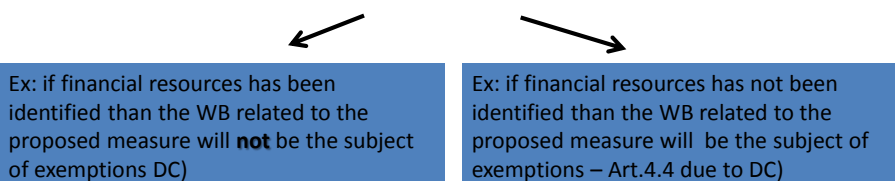


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CBA approach for WFD (2)

Estimation of cost benefit ratio < 1, > 1

Criteria : if the **benefit is above the total costs** than a financial affordability analyze was performed.



If the **benefit is less than total costs** than the WB related to the proposed measure will be the subject of exemptions – Art.4.4)



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CBA Approach MSFD (1)

Main steps

- Identification of benefits
- Qualitative description of benefits
- Ranking of benefits (equivalent)
- Valuation of benefits based on economic valuation
- Ranking the costs
- Cost benefit ratio

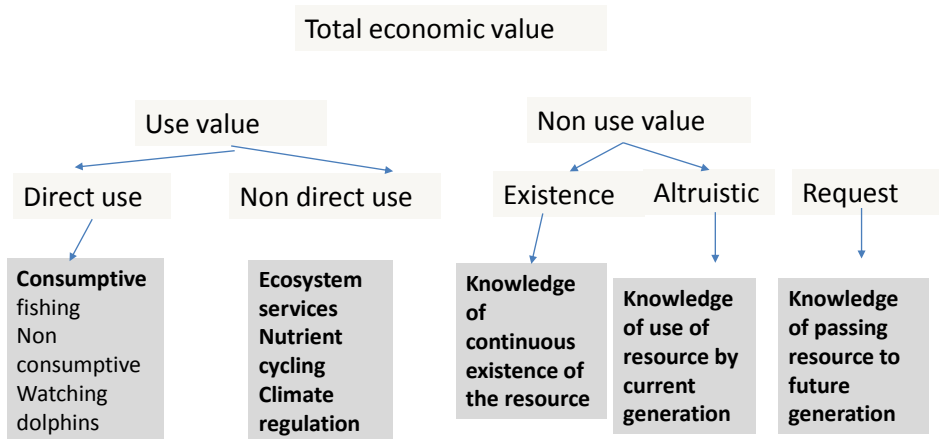


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CBA Approach MSFD (2)



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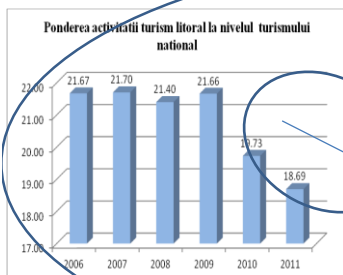


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CBA considers whether measures or a PoM would provide net gains to society

~ "Member States shall give due consideration to sustainable development and, in particular, to the social and economic impacts of the measures envisaged"

Tourism



- algae bloom !!!



- eutrophication

Nutrients
pollution

Human
agglomeration
Agriculture

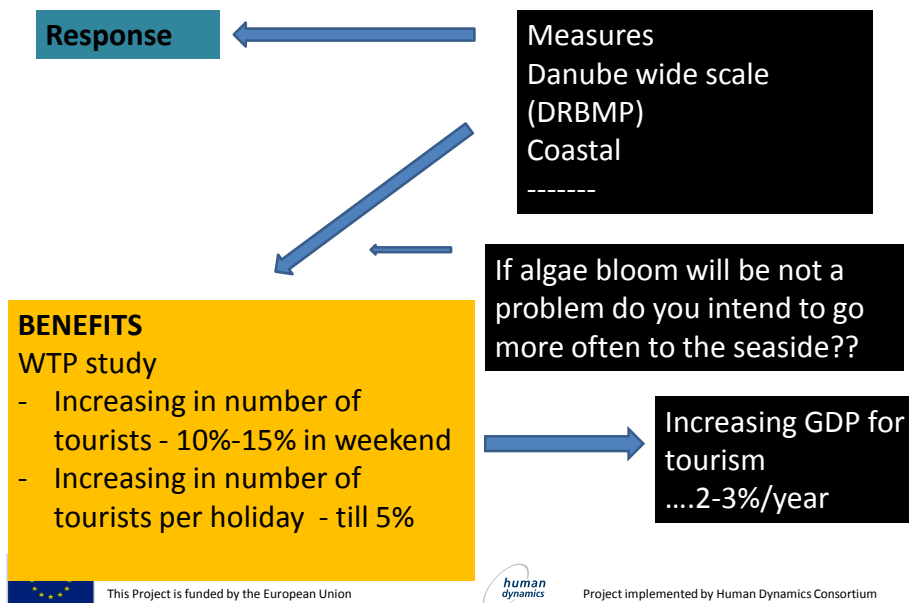


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Case study : Cost-recovery concerning drinking water supply in Bavaria (1)

In the German DRB, there are regular benchmarking projects assessing cost-recovery of water services.

The studies are designed and conducted by private consulting firms. Project partners include council associations, associations of water and wastewater services and state environment agencies and ministries.

One such study assesses efficiency and quality of drinking water supply in Bavarian communities and is conducted every three years.

In the 2006 study, the participating companies accounted for about 30% of all drinking water distributed in Bavaria and included companies with <0.5 to >2.5 million annual water distribution.



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Case study : Cost-recovery concerning drinking water supply in Bavaria (2)

The study collected a wide range of information and indicators such as organisational set-up, cost and revenue structures, network properties and losses, water treatment, energy use, personnel, and many others.

With an average rate of around 100% for the participating companies, the study confirmed **full cost-recovery in the German DRB**.

Depreciation and interest accounted for over 30% of total cost; personnel, materials and services procured from third parties for approx. 20% each; Taxes, fees etc. together accounted for approx. 7% of costs.

On average, the participating companies invested approx. 4000 Euro per km of their total supply pipe length in 2014.



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Cost-recovery concerning drinking water supply and wastewater services in Croatia (1)

Case study area: County of Karlovac, 3622 km²

Population: 141,787, of which 61% are connected to the public water supply, 30% are connected to the public sewerage systems with no wastewater treatment.

Cost-recovery was analysed for four utility companies (Duga Resa, Karlovac, Ogulin, and Slunj) comprising approx. 75% of all water services provided in the study area.

Water supplied: 7.2 million m³; wastewater collected: 3.9 million m³.

In line with the Utilities Act and the Water Management Financing Act, Croatia has a complex water price structure reflecting various cost components.



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Cost-recovery concerning drinking water supply and wastewater services in Croatia (2)

The cubic metre (m³) of water supplied to a final user is burdened with:

Service price (expressed separately for water supply, wastewater collection and treatment, if provided);

Water charges (obligatory expenditure set at the national level by the State Government) and development charges (facultative expenditure set at the local level by local government) which are strictly intended for recovering investment costs and the costs of water administration and management related to ensuring water availability and water quality;

Value added tax (general tax paid to the state budget).



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Cost-recovery concerning drinking water supply and wastewater services in Croatia (3)

The assessment shows cost-recovery of approx. 70% of the total O&M costs of providing water services in the study area (77% for drinking water supply and 45% for wastewater services).

In many cases, service prices do not reflect real costs as local authorities.

The assessed rate of recovering total financial costs is lower due to large investments, especially in wastewater infrastructure in the study area.

Investments are co-financed from national funds (mainly from revenue from water charges that are collected at the national level and allocated without return into particular local projects according to set criteria reflecting priority and solidarity in the development of water infrastructure across the state).

Results for the study area are not representative of the whole of Croatia.

The national scale is the most appropriate scale for analysing cost-recovery of investment and water administration and management costs.



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Cost-recovery concerning drinking water supply and wastewater services in Croatia (4)

The Water Management Strategy (adopted in 2008) provided for the implementation of reforms and the rationalisation of the water utility sector in Croatia as well as the gradual application of the cost-recovery principle by 2015.



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Case study: Cost-benefit concerning the extension and rehabilitation of water and wastewater systems in the Cluj / Salaj counties of Romania (1)

The weighted average tariff of the regional operating company for water and wastewater (ROC) in 2006 was 1.38 RON/m³ for water and 0.62 RON/m³ for wastewater. In real terms, the tariffs in force in the project region of Cluj-Salaj in January 2007 had increased by 52% since January 2004.

The current tariff plan foresees the introduction of a unique tariff for the total service area of the ROC, which from October 2007 shall be 1.83 RON/m³ for water supply and 0.82 RON/m³ for wastewater. A further increase in the water tariff to 1.93 RON/m³ was foreseen for the end of 2008.

The plan proposed a real increase of tariffs in 6 steps between 2007 and 2013.

In a first step, the average tariffs are increased to achieve full recovery of the DPC-S (dynamic prime cost of the total system (existing and new infrastructure)) related to Operation and Maintenance (OM&A) by 2011.



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Case study: Cost-benefit concerning the extension and rehabilitation of water and wastewater systems in the Cluj / Salaj counties of Romania (2)

By the end of 2013, the determined tariffs fully recovered the O&M (equivalent to 0.03 RON/m³ for water and 1.08 RON/m³ for wastewater).

In the case of the water tariff, a very limited increase is required to recover the additional cost generated by the project.

This is because a great part of the investment cost is covered by the long-term cost savings achieved by the project investments.

A further increase of the wastewater tariff of around +6% and +20% followed in 2012 and 2013, after which all WWTP were completed and put into operation (total tariff increase: +3.4% and +10%).



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Trends in water supply and demand up to 2027 Drina River basin

2027	Population (mil. inhabitants)	Total water supply (mil. m ³)	Water demand		
			Household (mil. m ³)	Industry (mil. m ³)	Agriculture (mil. m ³)
Bosnia & Herzegovina					
Montenegro					
Republic of Serbia					
Total Drina Basin					



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