



Evaluating Economic Policy Instruments for Sustainable Water Management in Europe



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Assessment of environmental outcomes and uncertainty

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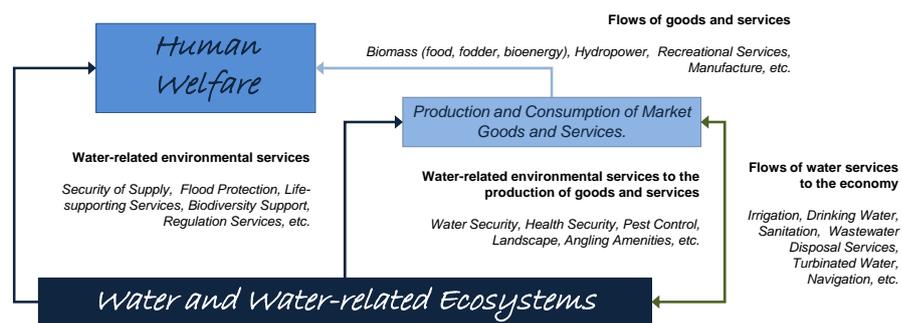
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> FEEM

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1. Assessment of Environmental Outcomes



· WATER-RELATED ECOSYSTEM SERVICES ·
Essential for human welfare and for the functioning of the economy
BUT its availability depends on the status of conservation of the ecosystems providing them.

· WATER SERVICES ·
Essential for the functioning of the economy BUT its provision implies pressures and impacts on water provisioning ecosystems.



2. Overall conclusion

Not quantitatively robust but qualitatively convincing results. Why?

◇ **Usual suspects:**

- Lack of data, no proper information systems, and competing explanations for observed outcomes.
- ◇ Yet, **information is not the only scarce resource** in water policy analysis:
 - The real role of environmental targets in existing water-related EPIs (more presumed than observed facts). A bit of “wishful thinking”.
 - The trade-off with other objectives (e.g. developmental and revenue raising).
 - The effectiveness of the delivery mechanism in practice.
 - The potential contribution of EPIs to cope with environmental challenges (quantity, quality, hydromorphology, etc.)



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3. Using new (or innovative) approaches to assess old material

◇ **Was there really an environmental objective?**

- *Hungary*

◇ **How to balance development and sustainability in water policy?**

- *EPIs for hydropower in Switzerland, Germany and Italy*

◇ **And where is the balance between managing water services and managing water assets?**

- *Subsidies in Cyprus*



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4. The actual drivers of EPIs adoption

- ◇ **Financial objectives may bias the selection of instruments against options aiming at changing behaviour** (flat rates based on cost sharing instead of marginal pricing).
- ◇ But:
 - Scaling provision costs, increasing scarcities and more stringent environmental standards will open the room to fairer (and more efficient) water prices (Metering in England and Wales and Emilia Romagna).
 - If improving the environment and cost recovery are two different targets (and they are) the best option is to design one instrument for each target (Germany).



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5. The critical role of the delivery mechanism

- ◇ **Two essential conditions for any properly designed EPI:**
 - Participation (rationality).
 - Incentive compatibility.
- ◇ But:
 - Agents can participate and not contribute to the social target.
 - ◇ Failing in coping with scarcity in Spain.
 - ◇ Investing on but not operating capital.
 - Or can even make a negative contribution.
 - ◇ Water markets increasing the use of water (Australia)



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6. What potential to contribute to:

◇ Drought and scarcity challenges:

- Wide scope for efficiency gains, demand management, adaptation to uncertain supply and water source substitution.

◇ Point pollution:

- Potential to finance and cost recovery (which are linked to financial rather than economic instruments) and to further reductions once prescribed standards have been reached.

◇ Diffuse pollution:

- Less uncertain results from land management alternatives (adapted land practices) than from broad measures (national agro-chemical taxes).

◇ Hydromorphology:

- Potential for incentives to adapt prevailing property rights to new regulations and to restore the ecological potential of rivers (labelling, best practices and PES schemes).



Uncertainty

“Uncertainty” has a wide variety of interpretations and usage, overlapping to some extent:

lack of knowledge, knowingly incurred imprecision due to approximations or the wish to use standard methods, measurement inaccuracy, limited faculty to know or to communicate knowledge, disbelief (i.e. lack of confidence or trust), inconsistency and arbitrariness of action, incompleteness of perception, ambiguity, vagueness, hesitation, inability to effect changes exactly as intended and irresolution



Uncertainty in EPI-WATER

- Uncertainty is a *'qualifier'* in our analysis, it helps to convey our *confidence* in the final conclusion,
- Possibly quantitative uncertainty analysis for performance (ability to achieve the policy targets), economic costs and social effects.
- Qualitative analysis with respect to the institutions and implementability (political uncertainty)
- Constrained by the available data, clarity of the policy goals (multiple objectives, no clear policy targets), lack of benchmark for comparison



EPI in brief

- the specification of the 'everything being equal' baseline describing the degree to which the objectives were fulfilled had no policy been introduced;
- the empirically ascertained policy outputs/outputs realised up to the assessment date (measurement or observation imprecision or biases); and
- projection of the policy outputs/outputs up to the date the policy effects are fully unfold



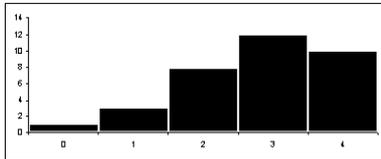
Pedigree matrix

Code	<i>Proxy</i>	<i>Empirical</i>	<i>Method</i>	<i>Validation</i>
4	Exact measure	Large sample direct measurements	Best available practice	Compared with indep. mmts of same variable
3	Good fit or measure	Small sample direct measurements	Reliable method commonly accepted	Compared with indep. mmts of closely related variable
2	Well correlated	Modeled/ derived data	Acceptable method limited consensus on reliability	Compared with mmts not independent
1	Weak correlation	Educated guesses / rule of thumb estimate	Preliminary methods unknown reliability	Weak / indirect validation
0	Not clearly related	Crude speculation	No discernible rigor	No validation

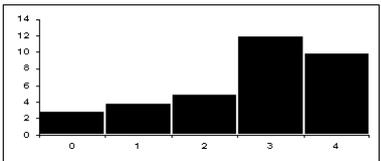
Source: van der Sluijs 2007



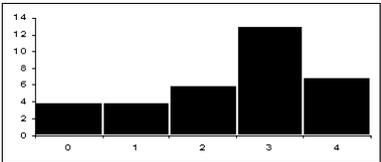
Environmental criteria



Exact measure
Good Fit
 Well correlated
 Weak correlated
 Not clearly related



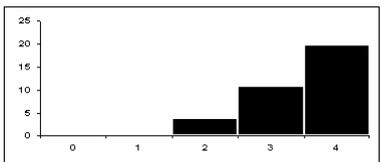
Large sample, direct measurements
Small sample, direct measurements
 Modelled, derived data
 Educated guesses
 Crude speculation



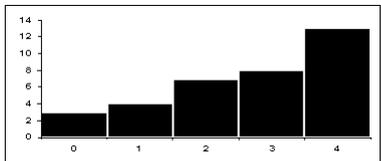
Best practice
Reliable method, commonly accepted
 Acceptable method limited consensus
 Preliminary, unknown reliability
 No discernible rigor



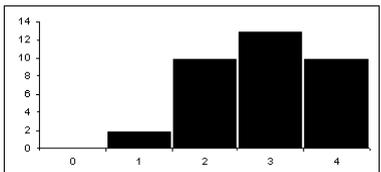
Economic criteria



Exact measure
 Good Fit
 Well correlated
 Weak correlated
 Not clearly related



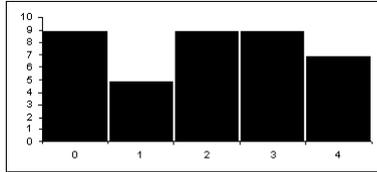
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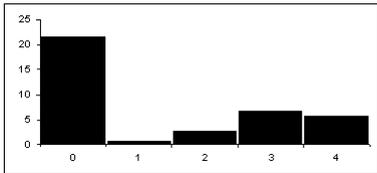
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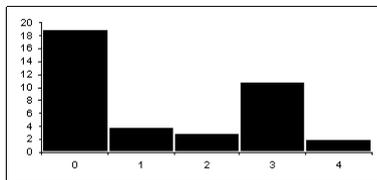
Distributional effects



Exact measure
 Good Fit
 Well correlated
 Weak correlated
Not clearly related



Large sample, direct measurements
 Small sample, direct measurements
 Modelled, derived data
 Educated guesses
Crude speculation



Best practice
 Reliable method, commonly accepted
 Acceptable method limited consensus
 Preliminary, unknown reliability
No discernible rigor



Criteria	Categories	No. of variables	Proxy	Empirical	Method
Environmental (EN)	Level of water pollution	9	3	3	3
	Qualitative state of water	3	3	3	4
	Water abstractions & consumption	13	3	3	3
	Use of pollutants	2	2	2	1.5
	Others	7	2	2	3
Economic (EC)	Cost of operation and investment	7	4	3	3
	Revenue and income	10	4	4	3.5
	Transaction costs	9	3	2	2
	Others	9	4	3	3
Distributional (DIS)	Social impact	22	2	0	1
	Firm Impact	17	2	0	0





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