



The challenge of the internalization of external costs

- procedure in Lower Saxony

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Initial procedure for cost recovery in 2009

Lower Saxony part of RBD	enterprises	revenues	expenses	cost recovery
	number	Euro	Euro	%
Rhein	2	15.972.612	15.547.035	102,7
Ems	23	57.697.392	56.806.890	101,6
Weser	97	435.555.917	426.990.231	102,0
Elbe	15	49.299.692	48.158.921	102,4
total	137	558.525.613	547.503.077	102,0

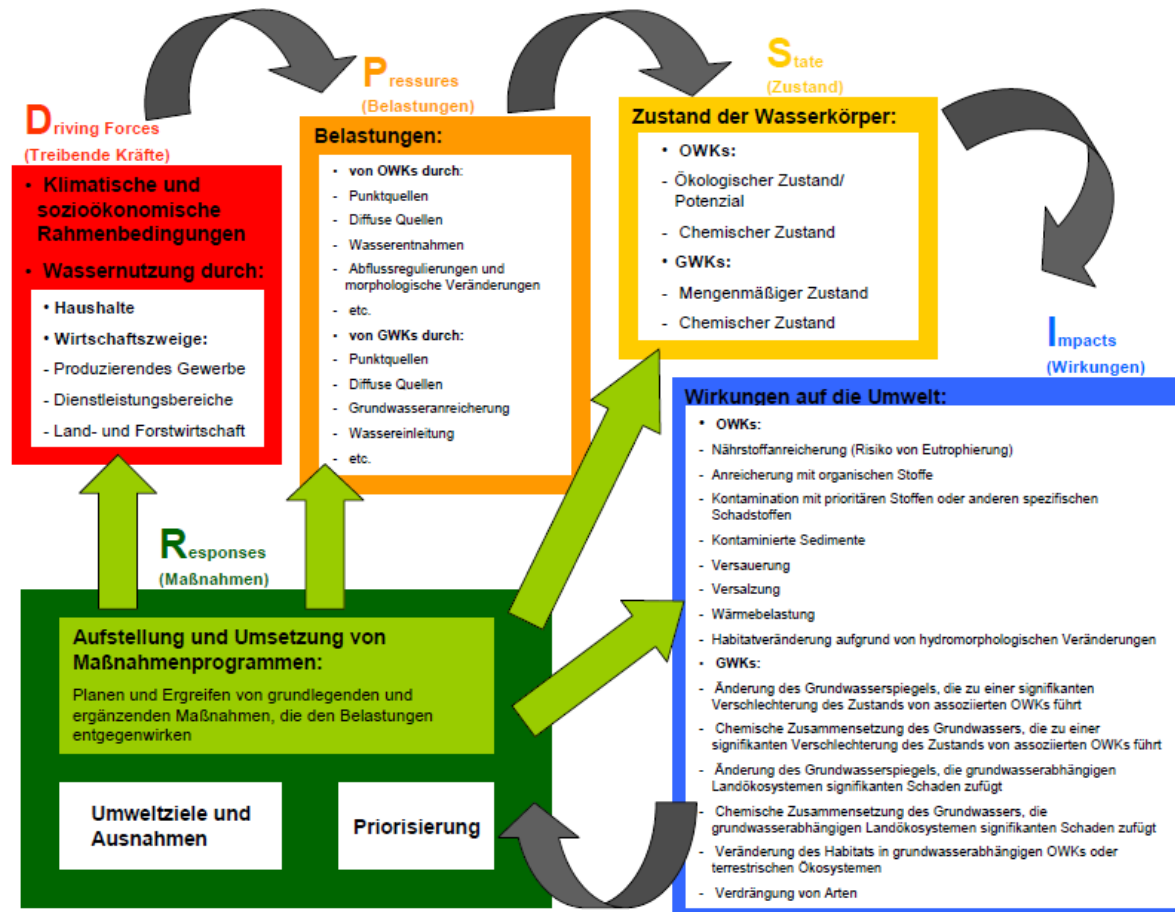
Cost recovery rates of public water suppliers for 2007

Lower Saxony part of RBD	enterprises	revenues	expenses	cost recovery
	number	Euro	Euro	%
Rhein	5	11.637.073	11.199.177	103,9
Ems	62	154.584.168	135.248.139	114,3
Weser	220	802.401.405	760.295.398	105,5
Elbe	63	121.653.577	109.828.567	110,8
total	350	1.090.276.223	1.016.571.281	107,3

Cost recovery rates of municipal wastewater disposal for 2007



DPSIR: drivers-pressures-state-impacts-responses





Assumptions and starting point for a study

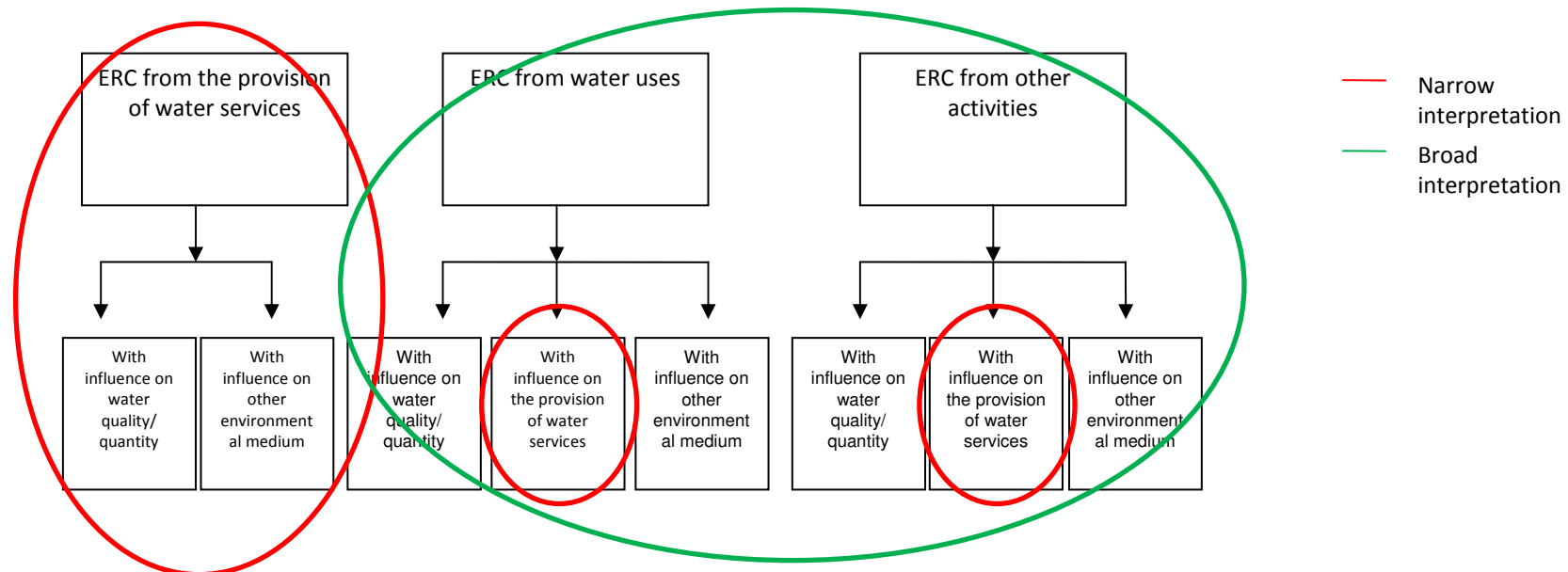
- Basic assumption: Not all relevant costs are being respected with the current pricing situation for water uses
→ general problem with the use of public goods are external effects
- The intention of an internalization of environmental and resource costs is to establish an incentive for the sustainable and efficient use of water as a resource → Art. 9 WFD
- But: there are unclarities concerning central elements of Art. 9 WFD (and recital 38)
 - Concerning the differentiation between ERC
 - There are several approaches to this, no legal statement so far
 - Concerning water uses and water services
 - Interpretation of the polluter-pays-principle
- Procedure in our study:
Because of missing legal interpretation → economic abstraction of the Directive's requirements





Implication and setting of the study

- Art. 9 WFD expresses the intention of a sustainable and efficient use of water with the internalization of external effects and the associated costs (ERC)
- These effects and costs are not only caused by the provision of water services but also by water uses (as well as other activities)
- For the identification of ERC the following scheme was developed:





Objective and structure of the study

Objective:

- Identification of the ERC for all settings,
- As far as possible a quantification
- Display of existing instruments for internalization and identification of new possibilities for internalization

The structure is divided into two sections

1. State-wide approach: identification of all ERC in Lower Saxony based on the information on pressures from the RBMP (not applying the polluter-pays-principle → limitations to DPSIR)
2. Approach from the water service providers: identification of ERC that occur from the provision of water services and how the provision of water services is effected by other activities



Procedure

3 Steps that are followed in both approaches, the state-wide and the approach with water service providers:

1. Systematic identification of the pressures

- Analysis of the characterization reports and the RBMP; in addition to that expert interviews have been conducted
- Pressures on surface waters were categorized as pollution by substances, passability as well as hydromorphology, the categorization for ground water follows quantity and quality

2. Monetarization

- Is performed based on the pressures identified in the first step
- No primary data acquisition was conducted
- The valuation was conducted based on existing studies, which were basically cost-based approaches

3. Polluter related internalisation: instruments und further ideas

- Are ERC already being internalized?
- If so, with which instruments?
- Do further aspects or instruments exist?



State-wide approach: systematic analysis of the pressures

The systematic analysis of the significant pressures based on the information from the WFD process and expert interviews provided these information of pressures:

1. Nitrate in ground and surface waters
2. Ground water quantity (very restricted in time and scale)
3. Pollutant contamination
4. Passability and hydromorphology (structure)
5. Other anthropogenic pressures from potash industries and historical mining in the Harz mountains (RBD Weser); and to some extent munitions from past wars (in coastal waters)



State-wide approach: the example of nitrate pollution

- A full ascertainment of ERC for Lower Saxony is not existing
- Partial analysis for the RBD Weser
 - ERC for the Lower Saxony part of the RBD Weser for ground and surface waters were estimated 61 Mio. €
 - But: based on assumptions on measures to reach GES, no further ERC considered
- So far the internalization is conducted via the main polluters
 - Obligations in the form of cross compliance and the Codes of Good Practice
 - Basic measures e.g. as the Nitrates Directive
 - Further measures via obligations as the European Agricultural Fund for Rural Development (EAFRD)
- A further point for discussion on internalization would be e.g. a tax on fertilizers



State-wide approach: results

Systematic identification of the pressures:

- The identification was in most cases possible, some pressures have already been lowered

Identification of polluters

- In most cases polluters could not be (clearly) identified, in addition: some uses do not fit into the categorization scheme (e.g. traffic)
- It is to discuss if the categorization into the polluter groups (Art. 9) is necessary or useful with respect to the Directive's objective
- → in the majority of cases we cannot apply the polluter-pays-principle in practice and there are limitations to internalize costs correctly.

Monetarization

- ERC occur not only based on the provision of water services but also (and to a large extent) based on water uses. These costs have to be included.
- The level of ERC is only known for some pollutions, e.g. nitrate (and then only for parts of Lower Saxony)
- Primary data acquisition for the analysis of ERC are time- and cost-intensive. The approximation of ERC is regularly based on cost-based approaches, so the costs for measures are the lower limit.
→ the actual ERC may be a lot bigger

Internalization and instruments

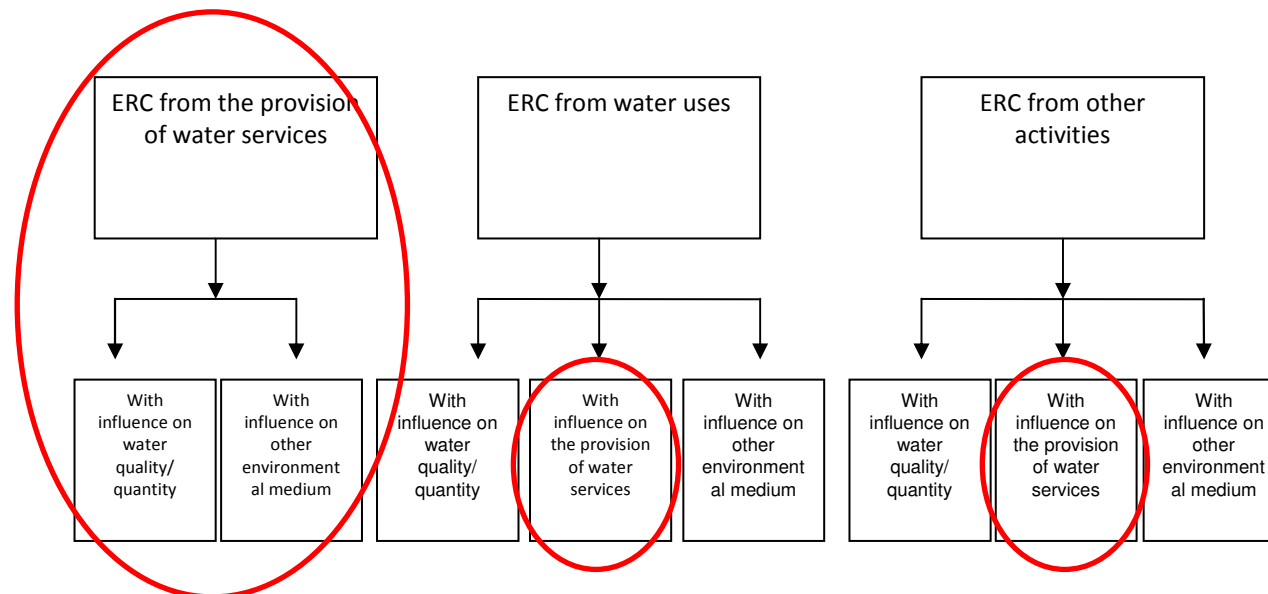
- Parts of ERC are already being internalized through obligations and other instruments.
- With the narrow interpretation of Art. 9 the major part of ERC is not considered.



Approach from the perspective of water service providers

Analysis of potential relations between ERC and the provision of water services

Method: data acquisition through expert interviews with water service providers in Lower Saxony





ERC: through the provision of water services

Rivalry in use of ground water

- Extraction can lead to lowering the ground water level with negative effects on the environment (vegetation and soil)
- No exact quantification of the loss expenses possible
- Water extraction charge (WEG) as an instrument for the internalization of ERC
- Rivalry of use arises in particular with agricultural irrigation
- Avoidance of rivalry use through the assignment of water use rights, in combination with requirements (e.g. payments of compensation)
- Single cases of negotiated settlements

Waste water management e.g. sewage sludge

- Waste water occurs with the provision of water. The waste water has to be cleaned before it is passed on
- No explicit quantification is performed

Impoundment for drinking water

- The impoundment influences the passability of water bodies
- The water treatment requires the use of chemicals
- This form of drinking water abstraction does not play a major role – therefore no high ERC



ERC through water uses

Industrial wastewater

- Pretreatment through the water users (under regulations) → partial internalization (PPP)
- High loaded waste water is partially internalized through fees; general sewage fee

Nitrate pollution from agricultural fertilizers

- Additional costs through mitigation costs based on participation on drinking water cooperations (e.g. through personnel expenses that are not compensated); as disposal costs for the use of technically higher procedures (membrane filtration); or the earlier closure of a well based on accumulation of mineral deposits or incrustations
- Costs of a measure can be identified, but are only partially EC
- Costs are internalized through water prices for water consumers

Pollution from plant protection products

- Single cases of new wells due to plume of plant protection products
- Costs for this case are calculable (approx. 175.000 € + OM costs for the old well)

ERC through other activities

Pollution based on metabolites and pharmaceutical products

- No significant relevance at this time, increasing significance very probable

Pollution based on traffic

- Analog to state-wide approach this could be a source of pollution, but no significance



Approach from the water service providers perspective: results

- The topic of WFD and ERC is hardly known → therefore no estimations of these costs exist
- Costs for the prevention of pollution that arise for the water service provider can be estimated through cost-based approaches, but are merely a minimum level
- Agriculture plays the major role with respect to occurring pressures and ERC
 - Rivalry in ground water use
 - Pollution through nitrate and plant protection products
- the abstractions charges serve as partial internalization: with these financial resources the drinking water cooperations are being paid to reduce the pollution from nitrate



Results from both approaches

Systematic identification of the pollutions:

- No high challenges in both approaches, the pressures that occur at the water service providers are a subset of all pressures

ERC

- The level of pollution is quite well monitored
- Generally there are no costs associated with the pressures in both approaches
- Known ERC only come from partial analysis based on cost-based approaches

Identification of polluters

- Diffuse picture on the state-wide approach; nitrate is one exemptions, all other pressures are hard to relate to a polluter
- Water service providers face basically ERC from agricultural land use

Approaches for internalization

Differences between the two approaches

- State-wide approach shows amount of ERC and polluter are hard to identify
- General internalization is performed with regulatory instruments
- Water service providers internalize through the water prices for consumers
 - Waste-water charges follow to some extend the polluter-pays-principle, fees for high-loaded wate water for single enterprises
 - Water abstraction charges: no application of the polluter-pays-principle but partially internalization
 - Charges and fees are flat rate



Implications

Water services and water uses

- ERC occur independantly from providing water services, but cannot be fully internalized through water prices → from an economic perspective the distinction between services and uses provides no additional value with respect to the Directive's objectives.
- The internalization through water prices requires a lot of information that should be provided with the economic analysis → high costs
- Other approaches need less information but also lack in added value
- If other internalization approaches are considered the distinction between services and uses also lacks economic logic

ERC

The discussion of the distinction between ERC and it's definition as well as its depths of interpretation is obsolet

- The polluter-pays-principle has to be applied to every activity that effects water (ERC)
- There is no sense in distinguishing between EC and RC, or call them external costs, costs of damage etc.

A full analysis of ERC in a state-wide approach is neither reasonable nor necessary

- Existing pressures are internalized through existing regulatory intruments, the amount of ERC is not needed for this approach
- If ERC should be internalized through market-based intruments (taxes or prices), the environmental pricing and standards approach should be used based on cost-benefit considerations (the amount of ERC is also not needed then)

The analysis of ERC at the water service provider is useful for the pricing

- Amount of ERC is highly dependent on the regional/local conditions
- A standardized guidance could lead to more transparency



Implications II

Polluter-pays-principle

- The identification of a single polluter/polluting source/source of pressure is problematic from a theoretical as well as a practical point of view
- It might be easier to start analysing from the pollutions/pressures (as done with water prices) and then identify approaches for prevention and reduction
- If single polluters/polluting sources can be identified, possibilities of internalization can be discussed
→ if ERC are known