

Justifying exemptions with disproportionate costs – cost-benefit analysis and alternative methods

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Background

Ongoing study of UFZ contracted by LAWA

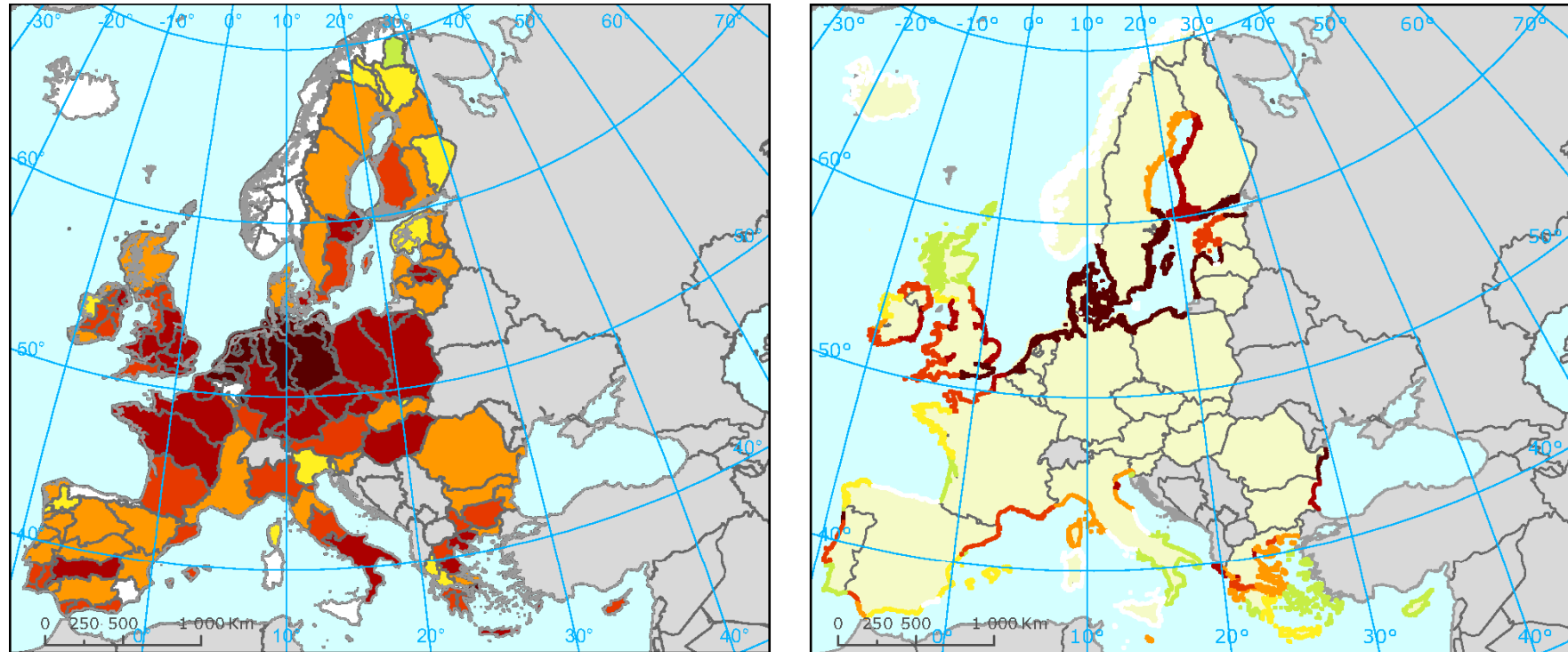
- **Starting point:** no established method for assessing (dis-)proportionality of costs
- **LAWA** (German Working Group on water issues of the Federal States and the Federal Government) *gave contract to* **UFZ** – Helmholtz Centre for Environmental Research
- **Duration:** 2/2014-1/2015
- **Goals:**
 1. Overview over existing conceptual studies and case studies on assessment of (dis-)proportionality
 2. Development of a practicable, harmonized approach to assess (dis-)proportionality
- **Case studies:**
 1. Bavaria: passability of dams
 2. Lower Saxony: heavy metal contaminations from historic mining in Harz region
 3. ???

Outline

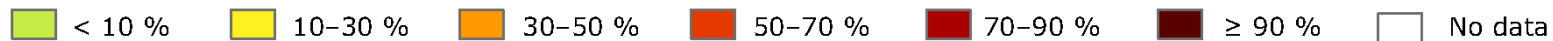
- 1 Exemptions – current situation
- 2 How to understand “disproportional”?
- 3 The German studies on disproportional costs
- 4 Conclusions

European situation

% of water bodies currently failing good status (2012)



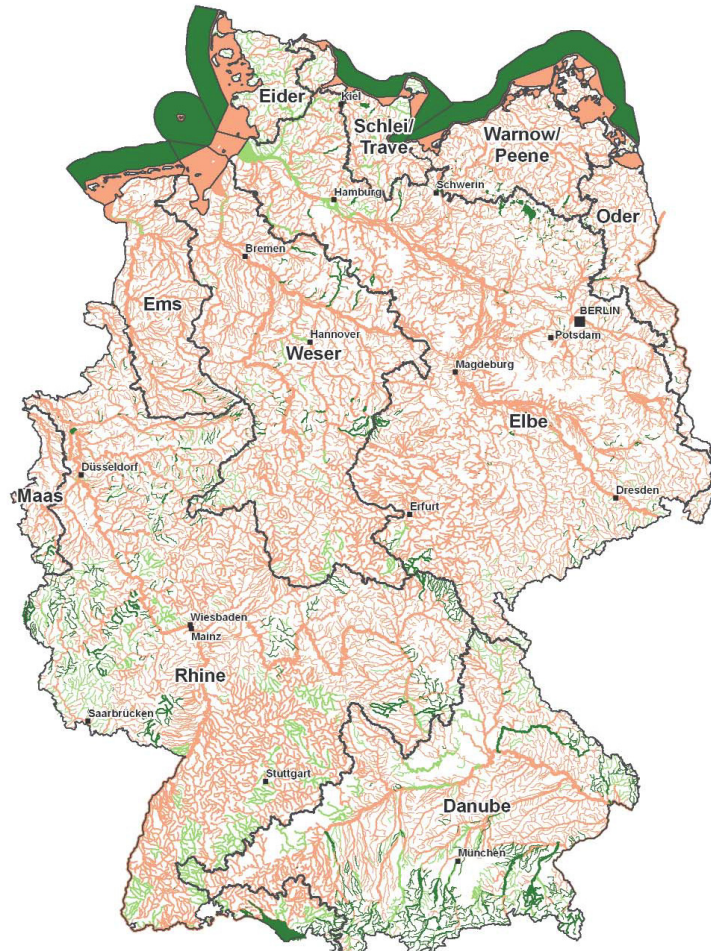
Percent of classified water bodies in less than good ecological status or potential



ETC/ ICM Technical Report 1/2012

Germany situation: Prognosis for 2015

Surface water bodies



82 % Exemptions

- Federal capital
- River basin district
- Objective already met
- Objective is slated for fulfillment by 2015
- Exemption in accordance with Article 4 of the WFD
- Exemption in accordance with Article 4 of the WFD

Groundwater bodies



36 % Exemptions

- Exemption in accordance with Article 4 of the WFD
- Uncertain

Source: Portal WasserBLICK/BIG; last updated 22 March 2010

German situation

Justifications for exemptions

River basin district	Technically unfeasible		Disproportional costs		Natural conditions	
	Art. 4.4	Art. 4.5	Art. 4.4.	Art. 4.5	Art. 4.4	Art. 4.5
Danube	146	0	160	0	282	-
Rhine	1246	18	277	5	215	-
Ems	479	0	14	0	273	-
Weser	1204	52	29	0	912	-
Elbe	2023	0	103	0	2461	-
Oder	307	0	0	0	452	-
Meuse	143	7	61	0	16	-
Eider	65	0	3	0	22	-
Schlei/Trave	146	0	45	0	173	-
Warnow/Peene	47	1	0	1	546	-
Total	5806	78	692	6	5352	-

Source: WISE

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How to understand “disproportional”?

Checking disproportionality requires *balancing* costs with something else – a standard of comparison.



Possible standards of comparison

1. Affordability for those who bear the costs

- Private agents (households, companies)
 - The state (member states, federal states, municipalities)
- *Guiding question: Where is the threshold?*

2. Costs compared with (intended) effects of measures

- **2a)** Costs compared with costs of similar measures
 - **2b)** Comparison of cost-effectiveness relations
- *Guiding question: What is a “normal”?*

3. Costs compared with benefits of measures

- **3a)** Benefits measured in monetary units
→ Economic cost-benefit analysis
- **3b)** Benefits measured by alternative methods
→ e.g. non-monetary benefit assessments,
multi-criteria analysis

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German Studies on disproportionality

Overview

1. Affordability

2007
Affordability
UFZ/Univ.
Leipzig/Ecologic

2. Effectiveness

Follow-up study

2008
"Leipzig Approach"
Univ. Leipzig/UFZ/Ecologic

Independent
applications

2012
Master thesis
Univ. Göttingen

2012
ESAWADI
Seeconsult & Intersus

3. Cost-benefit assessment

2014
Cost-benefit analysis
Wupper, RUFIS

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1. Affordability

2007: UFZ, University of Leipzig, Ecologic

Main results

1. Affordability is a *theoretically and legally valid criterion* for disproportionality – *but only* with respect to Art. 4.4 (extension of deadlines).

2. Share of water charges in household income is a practical criterion for disproportionality.

Thresholds for share of water charges in household income

Threshold [%]	Proposed by
2.0	OECD
2.5	Environmental Protection Agency (USA)
3.0–5.0	World Bank

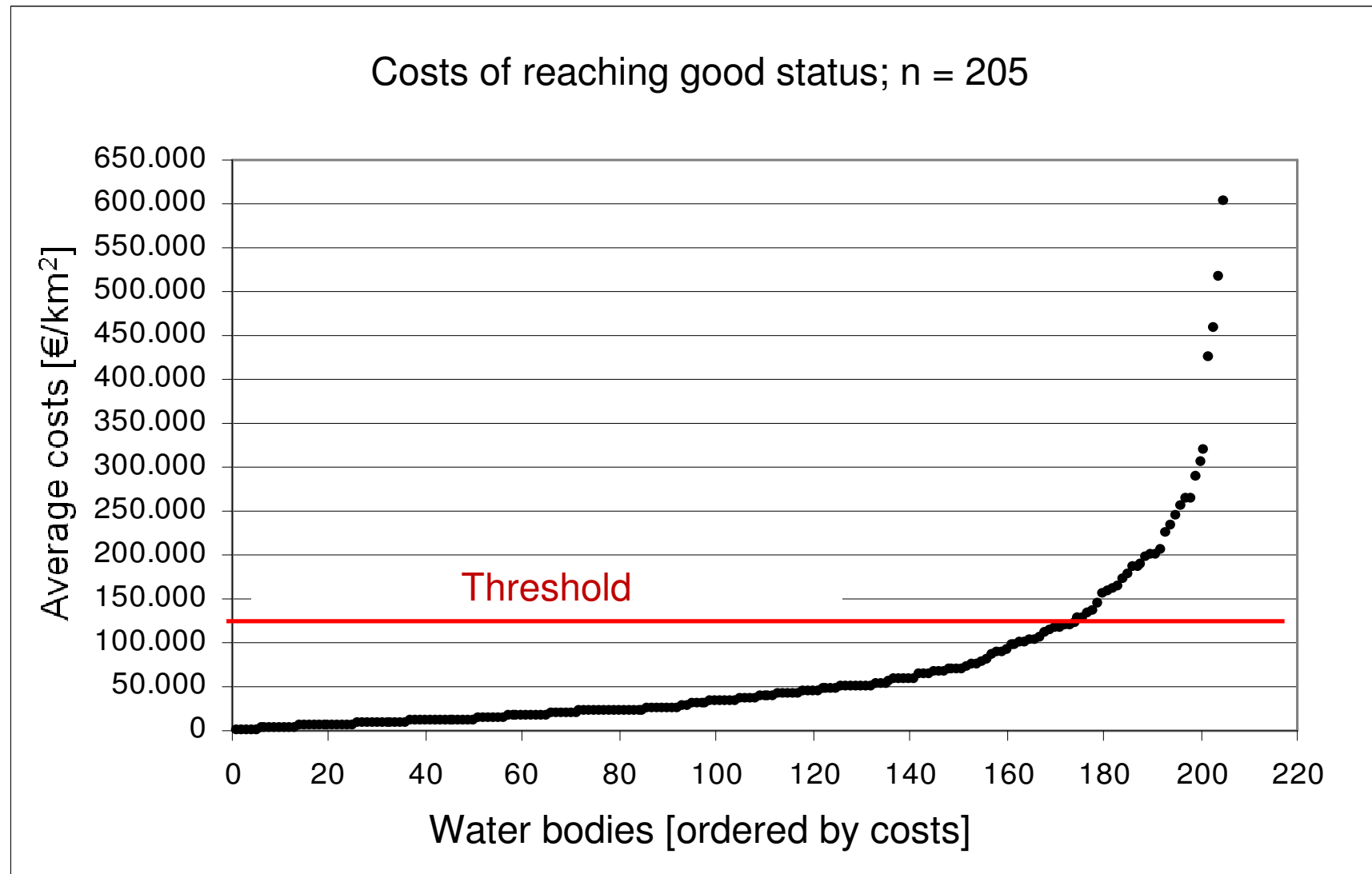
2. “Leipzig Approach” – effectiveness

2008: University of Leipzig, UFZ, Ecologic

- “Leipzig Approach” is a hybrid:
 - Cost-effectiveness considerations are supplemented with simple non-monetary benefit assessments
- Basic idea:
 - The main benefit of the programme of measures is the improvement of water status.
 - Compare water bodies by costs
 - assumption: water bodies/measures are comparable

2. “Leipzig Approach”

2008: University of Leipzig, UFZ, Ecologic



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Benefits of improving water status



Additional benefits (water and non-water related)

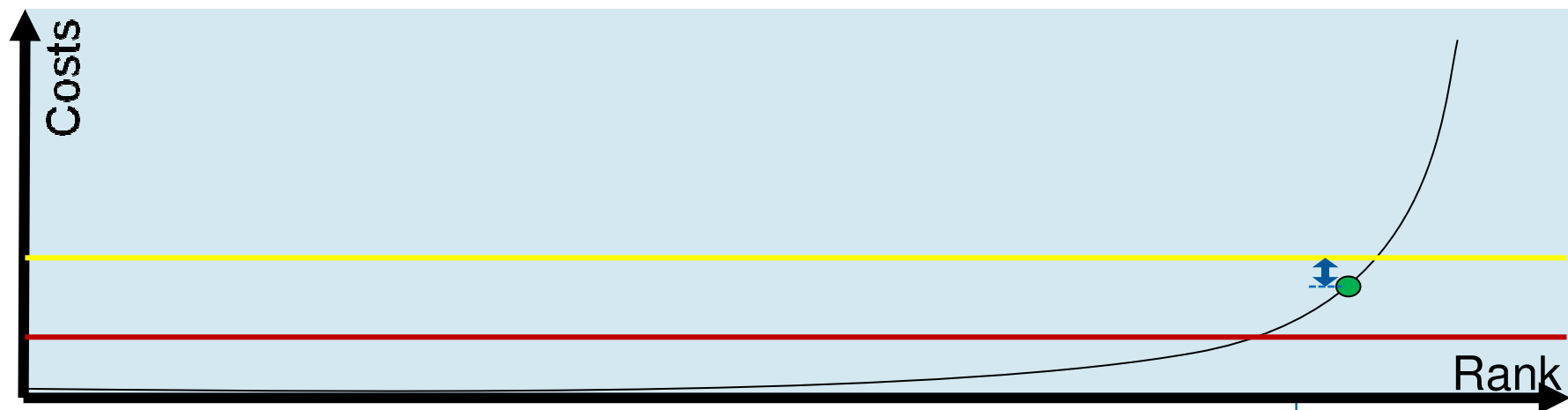


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2. “Leipzig Approach”

Overview over the procedure

- Step 1: Rank water bodies by costs.
- Step 2: Determine preliminary threshold (e.g. 2 x mean)
→ political statement
- Step 3: Investigation of (above-average) additional benefits for individual water body.
- Step 4: Adjusting threshold depending on individual additional benefits (e.g. 1,5 x old threshold)
- Step 5: Assess (dis-)proportionality



2. Applications of “Leipzig Approach”

Rhineland-Palatinate, ESAWADI, University of Göttingen

1. 2009: Applied in German federal state “Rhineland-Palatinate”

- Slight variation of Leipzig Approach

2. 2012: ESAWADI project – Ems River

- Focus on lateral and linear connectivity
- No appropriate cost data available
→ comparison of only two sub river basins
- Result: Leipzig Approach is (to a large extent) sound and applicable

3. 2012: Master thesis L. Jaumann on Lower Saxony – Kateminer Mühlenbach

- Similar findings

3. “Traditional” cost-benefit analysis

Wupper River case study

Situation: specific problem – multiple stress on the Lower Wupper River

- Thermal stress by two combined heat and power plants
- Hydro-morphological alterations in the urban area of Wuppertal
- Contaminations with filterable matter

Evaluation methods

- Costs: Detailed planning of measures including cost calculations
- Benefits: contingent valuation base on telephone survey of 1010 citizens.

Results of case study

- No clear decision: costs slightly higher than benefits.

Methodological reflections

- Discount rate and time horizon have immense influence on results
- Application of CBA very costly
- Open question: What if single measure is disproportionate but reaching good status of water body is proportionate.

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Conclusions

- Economic cost-benefit analysis is suitable for specific cases (cf. Wupper case study)
→ area-wide application is too costly
- Leipzig Approach also sound and suitable, but area-wide application also problematic
→ no appropriate cost data area-wide available, yet

But without cost data no disproportionality!

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