

## Identification of cost-effective technical measures for river basin management planning

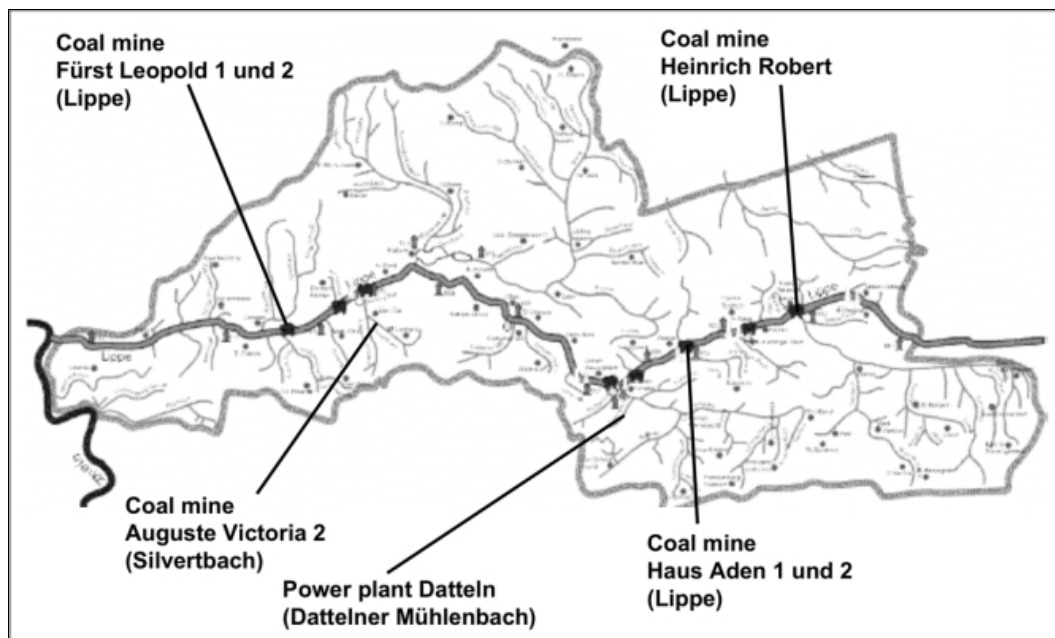
### BACKGROUND

The European Water Framework Directive (WFD 2000/60/EC) requires a good ecological and chemical status of surface and ground water bodies in 2015. A good status of European waters is often not reached due to hydromorphology deficits, pollutant emission etc..

In a research project financed by the Ministry for Environment, Conservation, Agriculture and Consumerism of North Rhine-Westphalia, Germany, a practical model was developed by the institutes of Urban Water Management in Essen and Weimar as well as Economic Policy in Bochum. This method was tested for the Lippe river catchment.

### PROBLEMS

- For a cost-effective implementation, it is necessary to develop a clear perception on useful measures, their effectiveness and costs before starting the development of programmes in 2009.
- A designated procedure has to identify measures at different scales: at river basin level or at water body level. Until now, a procedure for the selection of measures does not exist in Germany.
- For the Lippe catchment area, the available River Basin District Analysis report was used. The report contains a transparent assessment of all defined water bodies ("at risk" or "not at risk") as well as significant sources. From this follows that two parameters (temperature and chloride) caused significant problems of the water biocoenosis within almost the whole river.



## SOLUTIONS

- Identification and listing of measures and measure combinations for the reduction of the loads
- Estimate the effect of measures and measure combinations on the quality-specific problems required to reach "good water status"
- Determination of the investment and operating cost as well as the environmental and resources costs of the measures and measure combinations
- Definition of the environmental and resources costs for the evaluation of the most cost-efficient measures
- Development of a procedure for the selection of the most cost-efficient measure combinations for specific water quality problems interconnected with the cost of the measures
- The basis of the project was the compilation of measures and their characterisations in measure catalogues
- These measures have to be combined by minimising costs and maximising effects (fixed-effectiveness-approach).

## PROJECT PROCESSING / MEMBERS:

S. Meusel, J. Londong  
Urban Water Management,  
Department of Civil Engineering,  
Bauhaus University Weimar  
<http://www.uni-weimar.de/Bauing/siwawi/>

P. Meyer,  
Economic Policy III,  
Department of Economics,  
Ruhr University Bochum

## BENEFITS

- The upper part of the Lippe river catchment is mainly used by agriculture without significant industries or point pollution sources; the lower part is marked by intensive water uses.
- For the Lippe river catchment, the following measures were analysed in relation to most cost-effectiveness for the parameters:
  1. Chloride from mining water:
    - Desalination systems,
    - Increased river runoff by using an existing flow regulation,
    - Detention in an open basin,
    - Discharge into other water bodies,
  2. Temperature (heat) from cooling and mining water:
    - Construction or change-over cooling system (cooling tower),
    - Usage of heat (heat exchanger),
    - Increased river runoff by using an existing flow regulation,
    - Shadowing of the water by trees
- During the project, resource costs were monetarised on basis of the WATECO definition

## AUTHOR

M. Friedrich  
Correspondence course  
"Water and Environment",  
Bauhaus-University Weimar  
99421 Weimar  
Germany

[marco.friedrich@bauing.uni-weimar.de](mailto:marco.friedrich@bauing.uni-weimar.de)

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