

Urban Water Management

Case Study II: Emscher Region

**Nadine Herbke, Britta Pielen, Jessica Ward
& R. Andreas Kraemer**

**Ecologic - Institute for International and European
Environmental Policy**

Berlin - Brussels

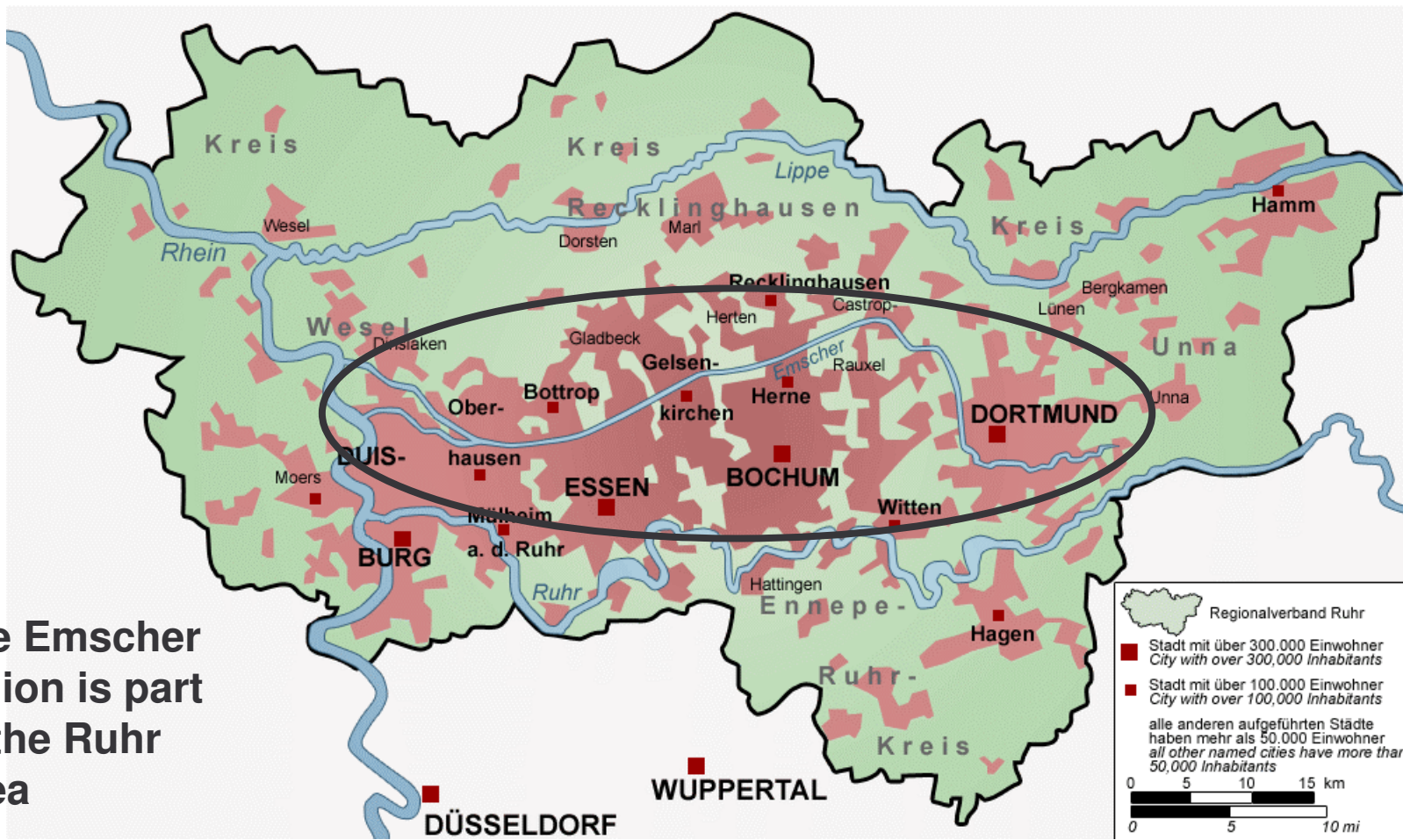


Content

- **History of the Emscher Water Supply & Sanitation (WSS) Services**
- **Sewage Collection and Treatment**
- **State of the Art**
- **Economic issues: management & charging system**
- **Impacts of the WFD**
- **Future needs and measures**
- **Main constraints**



The Emscher Region



The Emscher region is part of the Ruhr Area

History of the Emscher WSS

The history of the Emscher WSS can be divided into three main phases:

- **As from the 19th Century:** heavy industrialisation and related increase in water consumption & waste water accumulation
- **1904:** Establishment of Emscher Association and open sewer system to address these issues
- **1990:** Decision to reconstruct the Emscher system with a and restored watercourses (so-called “Emscher project”)

The Emscher Project 1990 - 2020

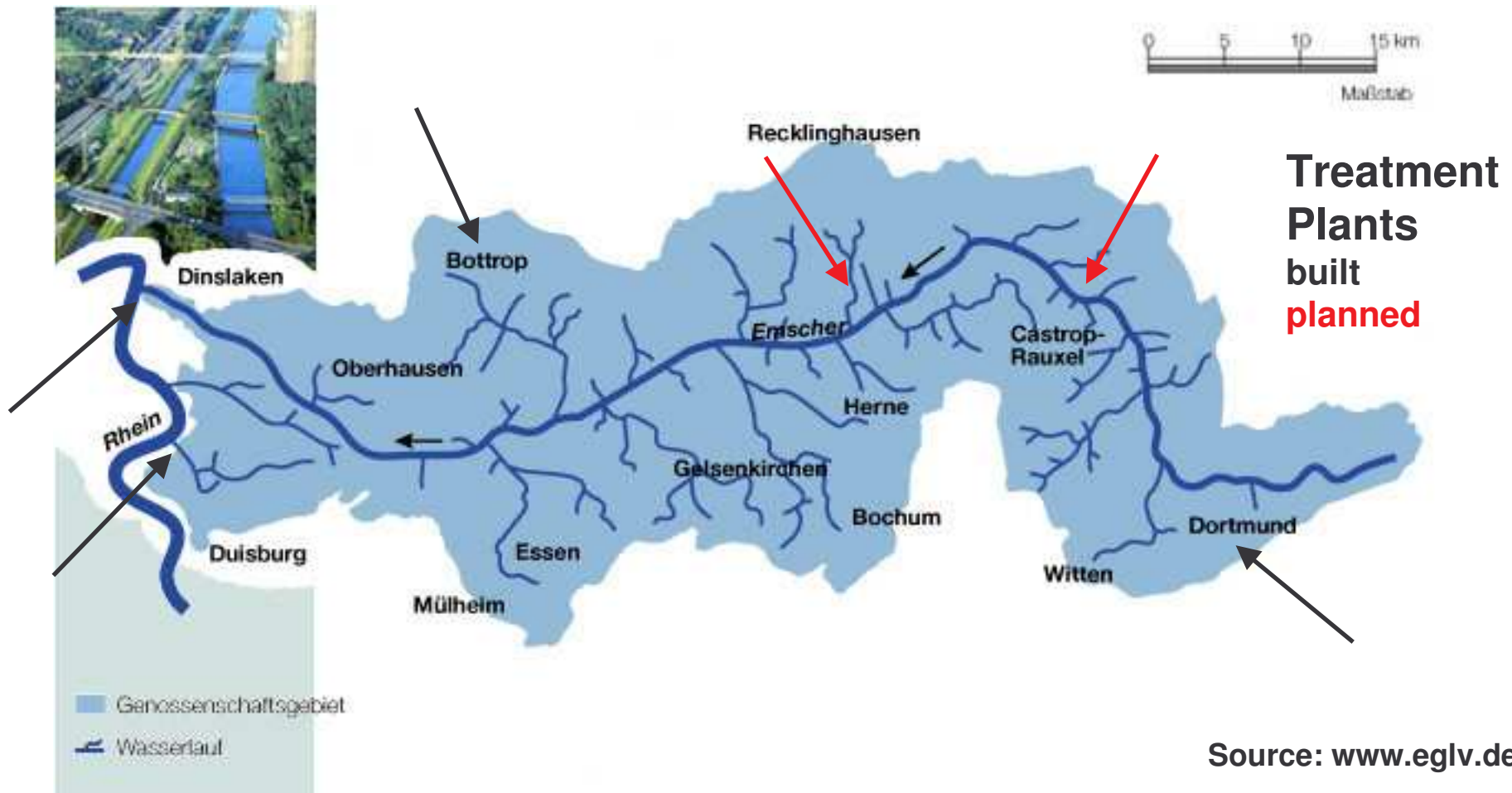
- **Decentralisation of the sewerage system: Building of new separated sewer system (parallel to Emscher) and two further treatment plants**
- **Infiltration of rainwater to enrich groundwater and re-establish the water cycle**
 - **Overall aim: disconnect approx. 15% of effective drainage area from the (combined) sewer by 2020**
- **Restoration of watercourses**
- **Several industrial enterprises have to construct new pre-treatment plants**

State of the Art I - Sewage Collection

- **99.4 % of the population connected to wastewater collection and treatment system**
- **Four modernised wastewater treatment plants (→ two further treatment plans planned)**
- **Tertiary treatment achieved**
- **Entire Emscher treated at the wastewater treatment plant located at its mouth before entering the Rhine**
- **Same at the Old Emscher**
- **[BUT: No achievement of good water quality at the site after the treatment work in the Rhine]**



State of the Art II - Sewage Treatment

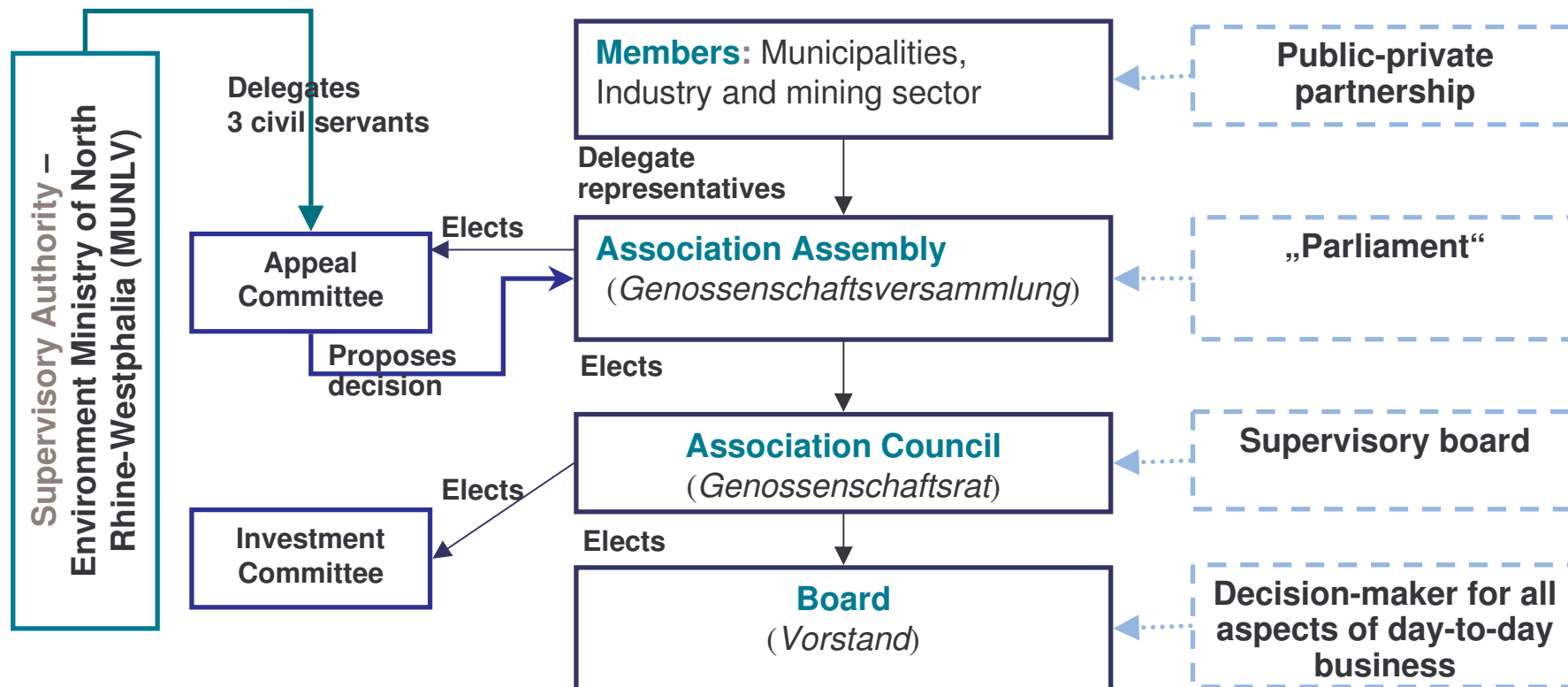


State of the Art III - Water Quality

- **Important hydromorphological pressures:**
> 90% of the Emscher rivers are heavily or completely modified
 - **High impact of municipal, industrial and mining water discharges**
 - **Highly polluted groundwater (with e.g. sulphate & polycyclic aromatic hydrocarbons)**
→ **Discharges into surface water**
- ⇒ **Surface and groundwater bodies will **not achieve** the WFD objectives by 2015**

Economic Aspects I - Management

Organisational Structure: Emscher Association



Economic Aspects II – Charging System

- **Membership fee** dependent on quantity and quality of sewerage and rainwater
 - Direct dischargers: pay directly to Emscher Association
 - Households represented through municipalities (*democratic legitimisation*)
- **Sewerage charges: 28% lower than average charge in North Rhine-Westphalia**
- **Contributions by mining corporations for investments (→ brownfield exploitation)**
- **Effluent charge (*Abwasserabgabe*)**
- **Cost recovery (Emscher River Basin) ranges from 96.9% to 107.2%**

Impacts of the WFD I

- **Institutional framework for WFD Implementation**
 - River basin perspective for more than 100 years (→ long tradition in North Rhine-Westphalia)
 - Establishment of effective river basin organisation for WFD implementation:
 - WFD Emscher basin agency (at Herten State Env. Agency)
 - Core Working Committee (incl. involved administration units & Emscher Association)
 - Area Forum (→ public participation)
- **Achievement of “Good Status” by 2015 ?**
 - Achievement of ‘good status’ unlikely
 - Emscher project is a key for WFD implementation

Impact of the WFD II

- **Co-operation among stakeholders & resp. entities**
 - **Already within Emscher project (→ establishment of project management system PROSEM)**
 - **Experiences with comprehensive project and involvement of numerous administration units**
- **Economic aspects**
 - **Charging system already takes up polluter-pays principle**
 - **Current investments: step towards long-term sustainability of service provision (→ ultimate aim of WFD Article 9)**



Future Needs and Measures

- **Abandonment of open wastewater discharge**
→ **Instead establishment of separated sewer system**
- **Construction of new sewerage treatment plants**
- **Improvement of rainwater treatment (e.g. infiltration of rainwater as far as possible to close natural water cycle)**
- **Reduction of municipal / industrial, trade & mining and polluted rainwater discharges**
- **Treatment of groundwater relevant point sources (e.g. discharges from contaminated sites)**
- **Restoration of watercourses**

Main Constraints I

- **Organisational constraints**
 - **Problem of timing: Emscher reconstruction to be finished by 2020 (sewer network already by 2014)**
→ **Authorities expect to extend WFD deadline 2015**
- **Technical constraints**
 - **Dikes cannot be removed**
→ **Limit widening of water courses and rebuilding of wetlands**
 - **Pumps needed to deliver water from tributaries into high-lying Emscher** → **Hindrance for river continuity**

Main Constraints II

- **Economic constraints**
 - **Further efforts required for assessment of cost recovery → Accounting for subsidies**
 - **Effluent charge – Suitable for internalising environmental and resource costs?**

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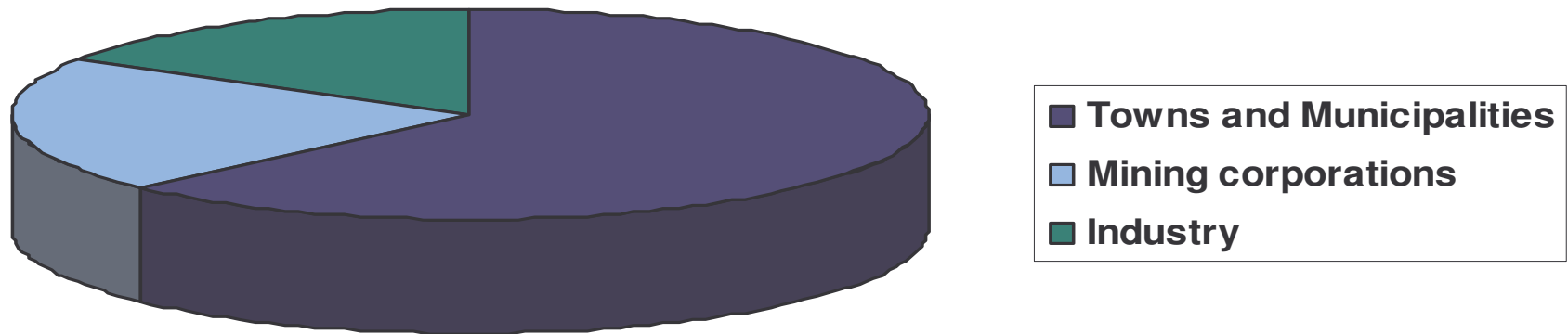
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Annex – Economic Aspects

**Financial Contributions (in million Euro) by Member Groups
(incl. effluent charge (*Abwasserabgabe*))**



Source: Emscher Association 2005