

# COLLABORATION POTENTIAL EMSCHER – MINAS GERAIS

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# Collaboration potential

Emscher – Minas Gerais

- Integrated **master plan** for the regional development
- Energy efficient and smart **wastewater treatment** and energy generation
- Experience in **risk prevention** (flood protection management)
- Experience in **mine closure and post-mining processes**
- Sustainable water management & good **governance**

# MASTER PLAN

**EMSCHER**  **LIPPE**  
GENOSSENSCHAFT EGLV.de VERBAND



# Masterplan for Minas Gerais

An integral regional planning tool for sustainable development

## Aim:

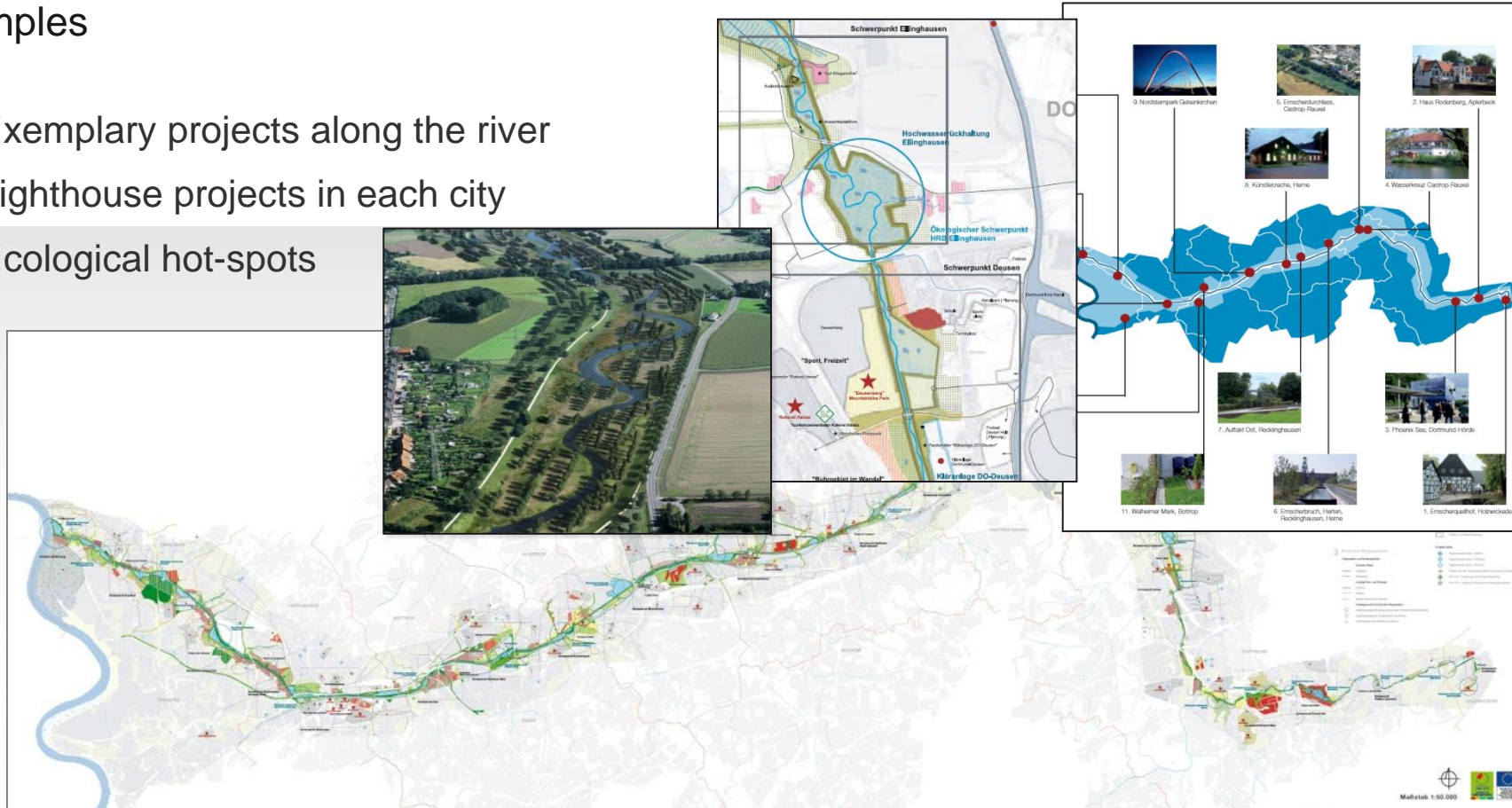
- Developing the river catchment sustainably
- Conducting a generation project



# Masterplan for Minas Gerais

## Examples

- Exemplary projects along the river
- Lighthouse projects in each city
- Ecological hot-spots





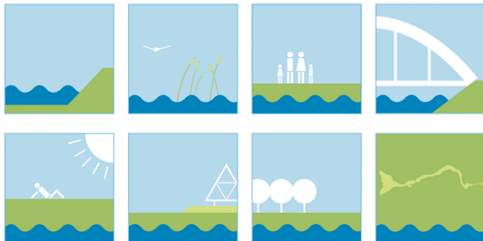
# Masterplan for Minas Gerais

## Approach for developing a masterplan

1. Collect basic information, frame conditions and required pre-conditions



2. Agree on guiding principles



3. Elaborate sub-concepts:

- Sustainable water management
- Ecology
  - restoration
  - ecological development
- Development of cities and open spaces
- Tourism
- Sustainable economic potential
  - fishing, agriculture
  - production, trade
  - regenerative energies



4. Develop goals and plans within the sub-concepts

# Masterplan for Minas Gerais

## Whom to involve?

- Experts (water management, ecology, ...)
- Municipalities
- Public (Participation!)

## Outcome:

- Commitment by the main actors
- Accepted by stakeholders and the public
- Flexible plan as a „living document“
- Road map



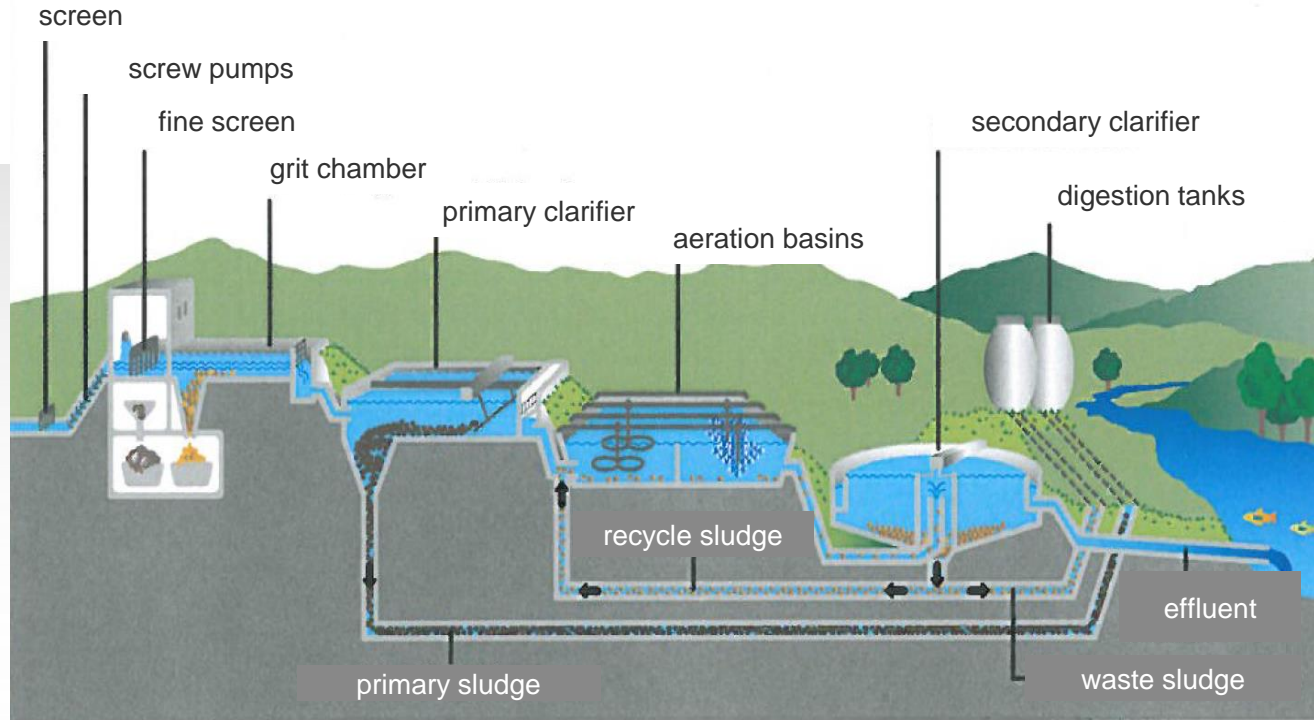




# WASTEWATER TREATMENT AND ENERGY OPTIMISATION

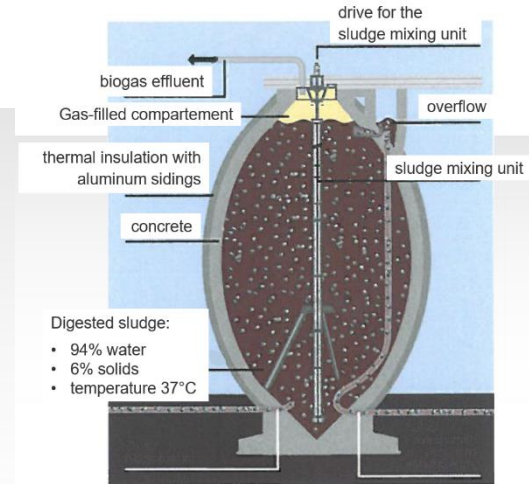
# Wastewater treatment plants and digestion tanks

Clean water is re-discharged to the rivers



mechanical treatment

biological treatment



# The transition from WWTTP to hybrid power plant

biogas production  
from sewage sludge

## WWTP Bottrop

- 1.4 Mill. PE for waste water treatment
- Consumption of electricity 40 Mill. kWh per year  
= Consumption of 25,000-German Residence City

sewage sludge  
incineration

gas  
storage

solar sludge  
drying

combined  
heat and  
power  
plant

Hybrid Power Plant  
Emscher

hydrogen by  
electrolysis












biogas and  
hydrogen from  
sewage gas  
(EUWAK)

wind power  
plant



# Energy production and CO<sub>2</sub> reduction

Planned and implemented measures

-  watercourse
-  waste water treatment plant
-  photovoltaic
-  wind power plant
-  Co-fermentation
-  incineration
-  steam turbine
-  heat from waste water
-  hydro power
-  geothermal energy
-  hydrogen



# Further expertise

## Flood protection, risk management

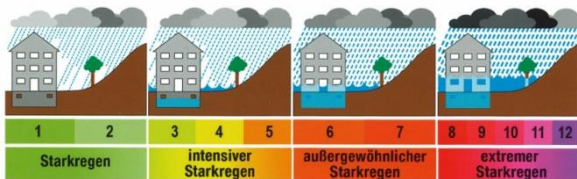
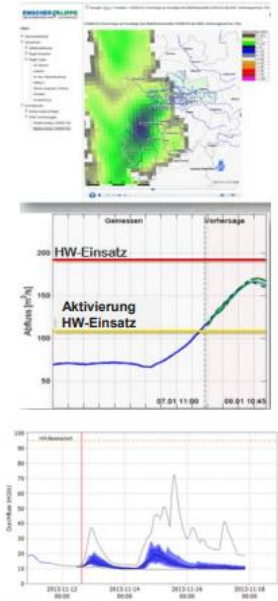


### V. Hochwasservorhersage



Icon	Titel	Beschreibung
	Unterhalb Warnschwellen	Unterhalb Warnschwellen
	Starkregenwarnung	Starkregenwarnung, mögliche Gefahr heftiger Gewitter und Starkregen bei unsicheren konvektiven Wetterlagen
	Aktivierung HW-Einsatz	Bestehende oder prognostizierte Überschreitung der Aktivierung HW-Einsatz
	HW-Einsatz	Bestehender oder prognostizierter Hochwassereinsatz

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# Further expertise

## Mine closure and post-mining processes

- German mining law
- Mine approval process, licencing
- Mine closure process, decommissioning plans
- Mine operating plans
- Monitoring (during and post mining)



- Further collaboration with Technical University Georg Agricola (Bochum)
- Further collaboration with University Duisburg-Essen and other universities
- Contacts to RAG (Ruhrkohle AG)
- Possible commissioning of EWLW (Emscher/Lippe Wassertechnik GmbH)



**SUSTAINABLE  
WATER MANAGEMENT  
& GOOD GOVERNANCE**

# 4 Action fields for mining and water management in a more sustainable landscape

## A new vision of sustainable management in mining and post-mining landscapes



**1**  
**Adoption of a landscape-scale and water management perspective**



**Recommendation 1.1**  
Develop concepts for an integrated and adaptive landscape management approach to minimize negative impacts during mining and post-mining activities.

**Recommendation 1.2**  
Build up effective governance networks during all stages of the mining activity.

**Recommendation 1.3**  
Build local communities' capacities and capabilities to ensure an ongoing process of self-sufficiency in post-mining scenarios.

**2**  
**Mandatory collaboration between scientists and mining companies to support landscape sustainability and research innovation**



**Recommendation 2.1**  
Create long-term collaborative relationships with independent research institutions with public funding and mandatory funding from the mining industry and with oversight from Scientific Advisory Boards.

**Recommendation 2.2**  
Integrate and implement novel and emerging technologies in a timely fashion.

**3**  
**Establishment of international standards and transparency of knowledge management**



**Recommendation 3.1**  
Create open-access platforms (Knowledge Management Systems, KMS) for exchanging and sharing knowledge about mining activity according to international standards.

**Recommendation 3.2**  
Institutionalize transparency and effective participation of all stakeholders during all phases of mining.

**4**  
**Proactive development of contingency plans and failure mitigation efforts throughout the overall mining process**



**Recommendation 4.1**  
Conduct environmental preservation, monitoring and risk prevention throughout the mining process.

**Recommendation 4.2**  
For the case of major failure, prepare immediate action plans as well as structured follow-up activities.



# Governance recommendations

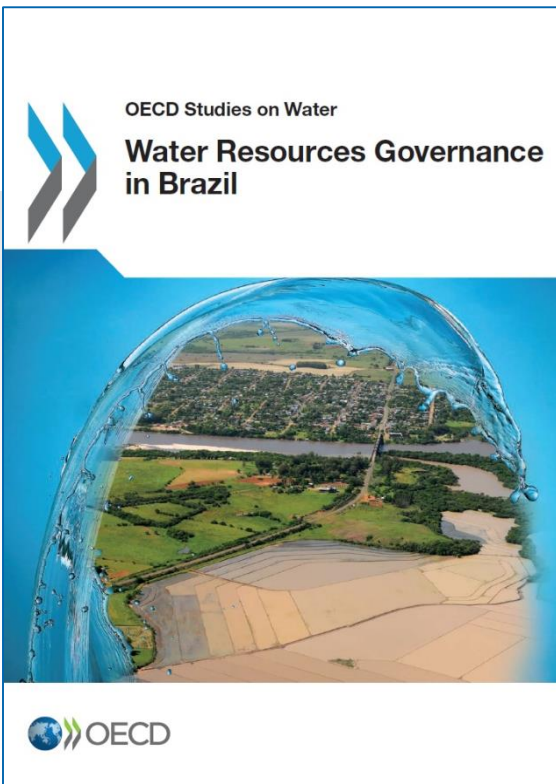
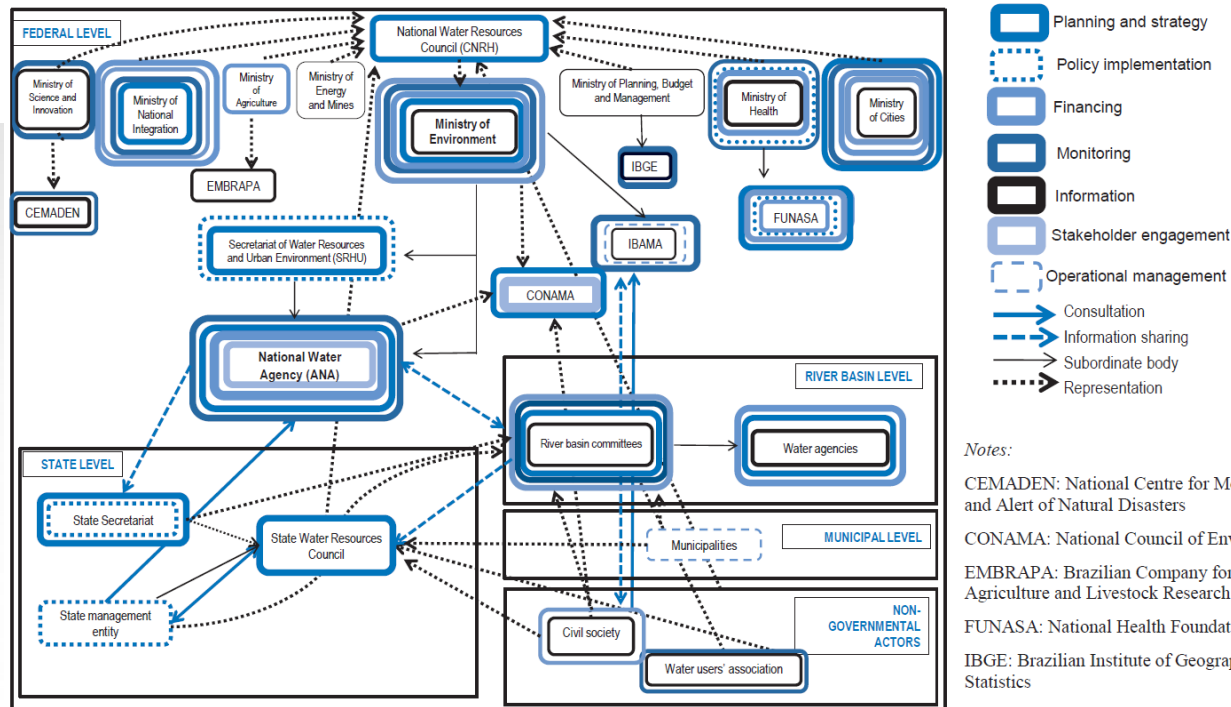
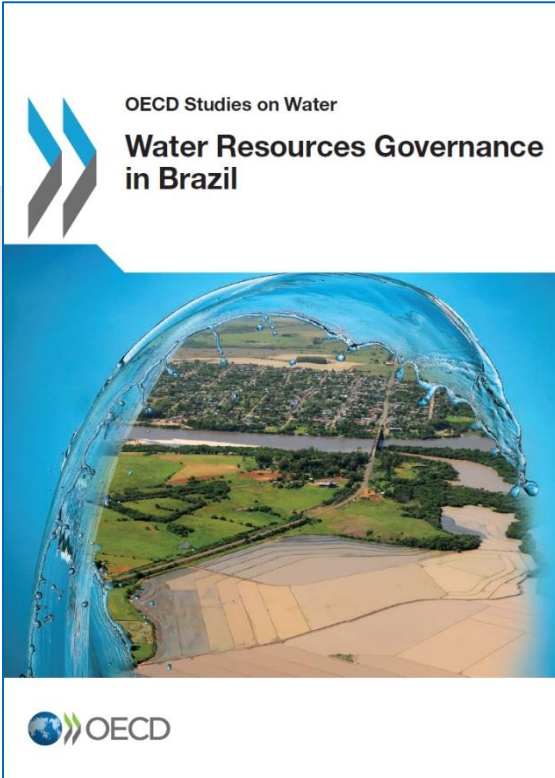


Figure 2.3. Institutional mapping for water resources management in Brazil



*Notes:*  
 CEMADEN: National Centre for Monitoring and Alert of Natural Disasters  
 CONAMA: National Council of Environment  
 EMBRAPA: Brazilian Company for Agriculture and Livestock Research  
 FUNASA: National Health Foundation  
 IBGE: Brazilian Institute of Geography and Statistics  
 IBAMA: Brazilian Institute of Environment and Renewable Natural Resources

# Governance recommendations



- Water as a strategic priority
- Strengthening national and state water resources councils
- Cross-sector co-ordination for policy coherence
- Strengthening the capacity of state-level institutions (staff, funding, enforcement)
- Strengthening the effectiveness of basin-level institutions
- Engagement of stakeholders
- Implementation of river basin plans
- Long-term vision towards sustainable water resources management
- Transparency and information-sharing
- Awareness raising about future risks
- Water resources plans to guide water allocation
- Sharing experience across states and basins