

Constellation Analysis as methodology for implementing Resource-Oriented Sanitation in Rural Germany

Enhancing the implementation of ROS by interdisciplinary planning methods

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SWWS & ROS Conference 2018
The International Water Association
14th – 18th October, 2018, Haifa/Israel



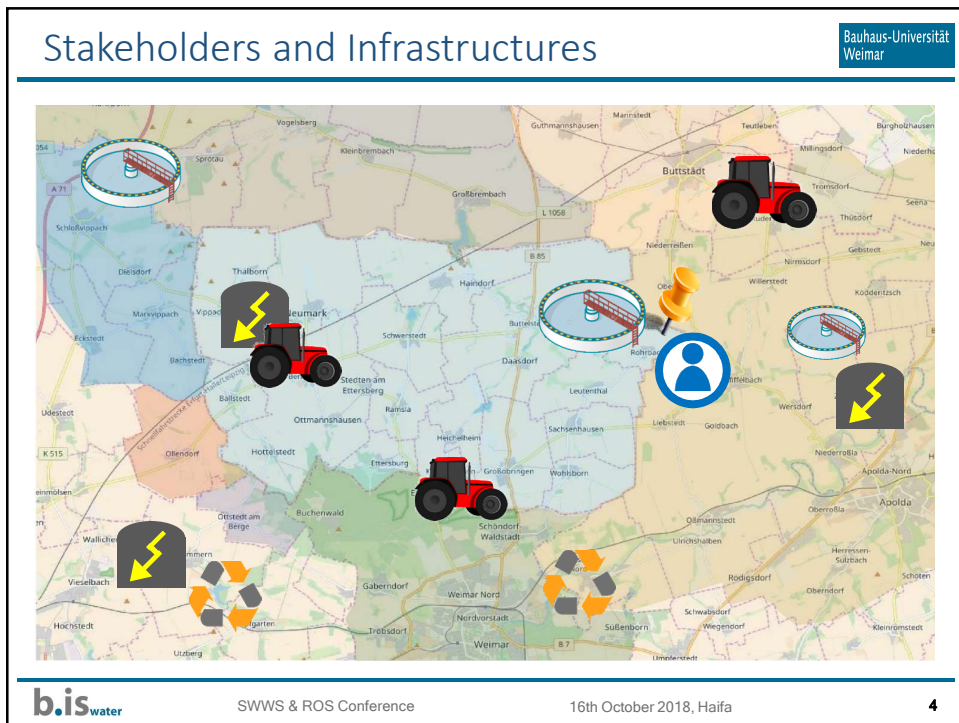
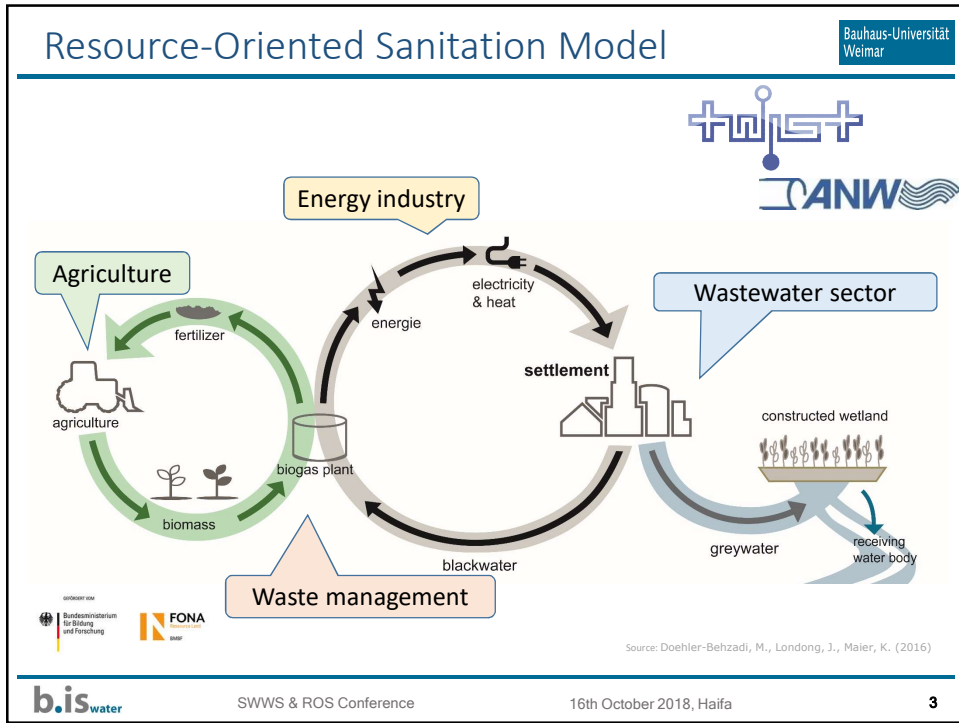
Case Study



Back ground

- » Eastern Germany
- » Population village: 200, population administrative union (24 villages): 9000
- » 8 Wastewater Treatment Plants
- » Connection rate: 50%






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Constellation Analysis – Conceptual approach


Back ground

- » **Aim:** “To open up innovation research processes for different perspectives regarding problems,[...] identification of strategic approaches for driving of innovation processes”. (Schoen et al. 2008)
- » **Principles:**
 - » Coequal consideration of heterogeneous elements
 - » Observations of their relations


Elements




Stakeholders



Symbolic elements





Technical elements




Natural elements

Relations

 Directed relation

 Oppositional relation

 Conflictual relation

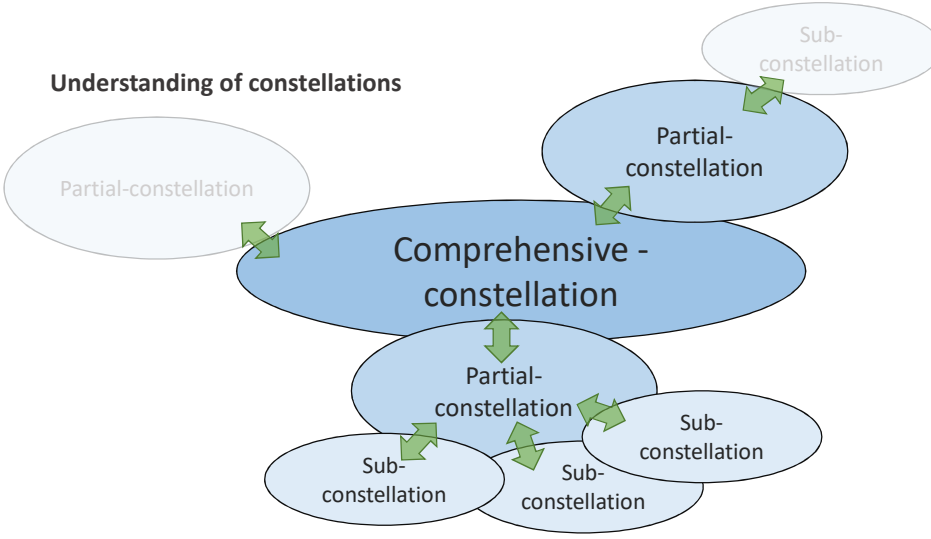
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Constellation Analysis – Conceptual approach

Understanding of constellations



The diagram illustrates the hierarchical and interconnected nature of constellation analysis. At the center is a large blue oval labeled 'Comprehensive - constellation'. Surrounding it are several smaller blue ovals labeled 'Partial-constellation'. These partial constellations are further broken down into 'Sub-constellation' nodes. Green double-headed arrows connect the comprehensive constellation to its partial constellations, and each partial constellation to its respective sub-constellations, indicating a dynamic and reciprocal relationship between all levels.

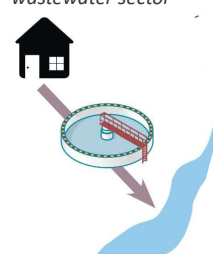
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Constellation Analysis –Strategical approach

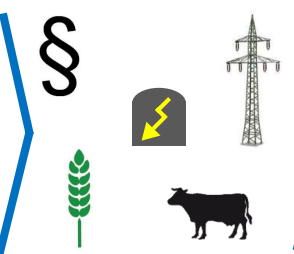
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Constellation Analysis as a tool for strategy formulation

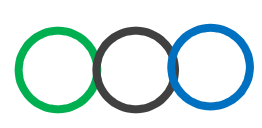
Initial-constellation
Current situation of the wastewater sector



Partial-/Sub-constellations
Fields of action



Target-constellation
ROS-Model in Rohrbach



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Constellation Analysis as a strategic tool

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Field of action: Identification of a biogas digester

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Constellation Analysis as a strategic tool

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Field of action: Utilisation of residues

The diagram illustrates the 'Field of action: Utilisation of residues'. At the center is a circle labeled 'Utilisation of residues'. Surrounding it are various actors and factors:

- Science** (orange box) has a positive relationship (+) with **Indiv. contracts** (orange hexagon).
- Customers** (orange box) has a negative relationship (-) with **Social acceptance** (orange hexagon).
- Demand of local goods** (orange hexagon) has a positive relationship (+) with **Demand** (orange hexagon).
- Indiv. contracts** (orange hexagon) has a positive relationship (+) with **Social acceptance** (orange hexagon).
- Social acceptance** (orange hexagon) has a positive relationship (+) with **Legal acceptance** (orange hexagon).
- Legal acceptance** (orange hexagon) has a positive relationship (+) with **National policies** (orange hexagon).
- National policies** (orange hexagon) has a positive relationship (+) with **Demand** (orange hexagon).
- Demand** (orange hexagon) has a positive relationship (+) with **Fertilizer** (green box).
- Increasing prices** (orange hexagon) has a positive relationship (+) with **Demand** (orange hexagon).
- Neg. reputation** (orange hexagon) has a negative relationship (-) with **Social acceptance** (orange hexagon).

Lightning bolt symbols indicate points of conflict or tension between 'Indiv. contracts' and 'Social acceptance', and between 'Demand' and 'Increasing prices'.

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Results – Operational concept of the ROS

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Phase I Stakeholders

Phase I shows an 'Existing and isolated operated ROS digester' (grey cylinder with lightning bolt). It produces **Biogas** (purple arrow) which goes to a **Power station** (grey house icon) to generate **Electricity** (yellow arrow) for 'Operational buildings and cowshed'. The digester also produces **Slurry** (orange arrow) which goes to the power station for **Heat** (orange arrow) and **Digested residues** (green arrow) which go to **Fields** (green plants icon).

Phase II Stakeholders

Phase II shows a 'New ROS digester' (grey cylinder with lightning bolt). It produces **Biogas** (purple arrow) which goes to a **Gas tank** (grey cylinder icon) and then to a **Power station** (grey house icon) for **Electricity** (yellow arrow) for 'Nearby village'. The digester also produces **Slurry** (orange arrow) which goes to the power station for **Heat** (orange arrow) and **Fertilizer** (green arrow) which goes to **Fields** (green plants icon). There is also a **Treatment for digested residues** (grey diamond icon) and a **Recycling symbol** (grey circular arrow icon).

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Conclusion on the case study

- » A specific operational concept for a ROS-Model was developed addressing national, regional and local requirements and interests
- » High flexibility is achieved by two implementation phases
 - » 1st phase: most feasible option (f.e. testing phase)
 - » 2nd phase: effective option (high level of linkages between different sectors)
- » Obstacles:
 - » Are known, manageable and can be directly addressed

Overall Conclusion

- » Differentiation of the context into a set of constellations as a pragmatic strategic approach
- » Analysis of crucial fields of action allows to identify specific potentials catalysing or obstacles hampering the implementation of the ROS
- » Applying the Constellation Analysis as a strategic tool can effectively enhance the implementation of ROS



Thank you!

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