Institute for Social-Ecological Research

HYPOWAVE

Building new Nexus: Wastewater Reuse in Agriculture from a Multilevel Network Perspective

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FONA Nachhaltiges Wassermanagement BMBF

Research approach

municipal wastewater

wastewater treatment & nutrient reuse

grocery stores and consumption

hydroponic crop production

source: https://www.zdf.de/nachrichten/heute-in-europa/videos/klimawandel-im-supermarkt-100.html

Implications of a multilevel network perspective

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- Dimensions of a **multilevel framework**
  - Cooperation between (resp. within) different policies and sectors
    (cf. Bahri 2009; Akhmouch and Clavreul 2016)
  - Cooperation between actors with a variety of organizational backgrounds – categories from organizational sociology from micro to macro level
    (cf. Toikka 2009; Schneider 2010; Daniell et al. 2014; van Merkerk et al. 2015)
  - Cooperation between administrations at different scales
    (cf. Hooghe and Marks 2003, 2012; van Buuren et al. 2008; Newing and Koontz 2013; Benson et al. 2015)
- Summarized in two axis:
  - horizontal forms of cooperation
  - vertical forms of cooperation

  (see Freeman 1984, 2011; van Hippel 1988, 2006)

Implications of a multilevel network perspective

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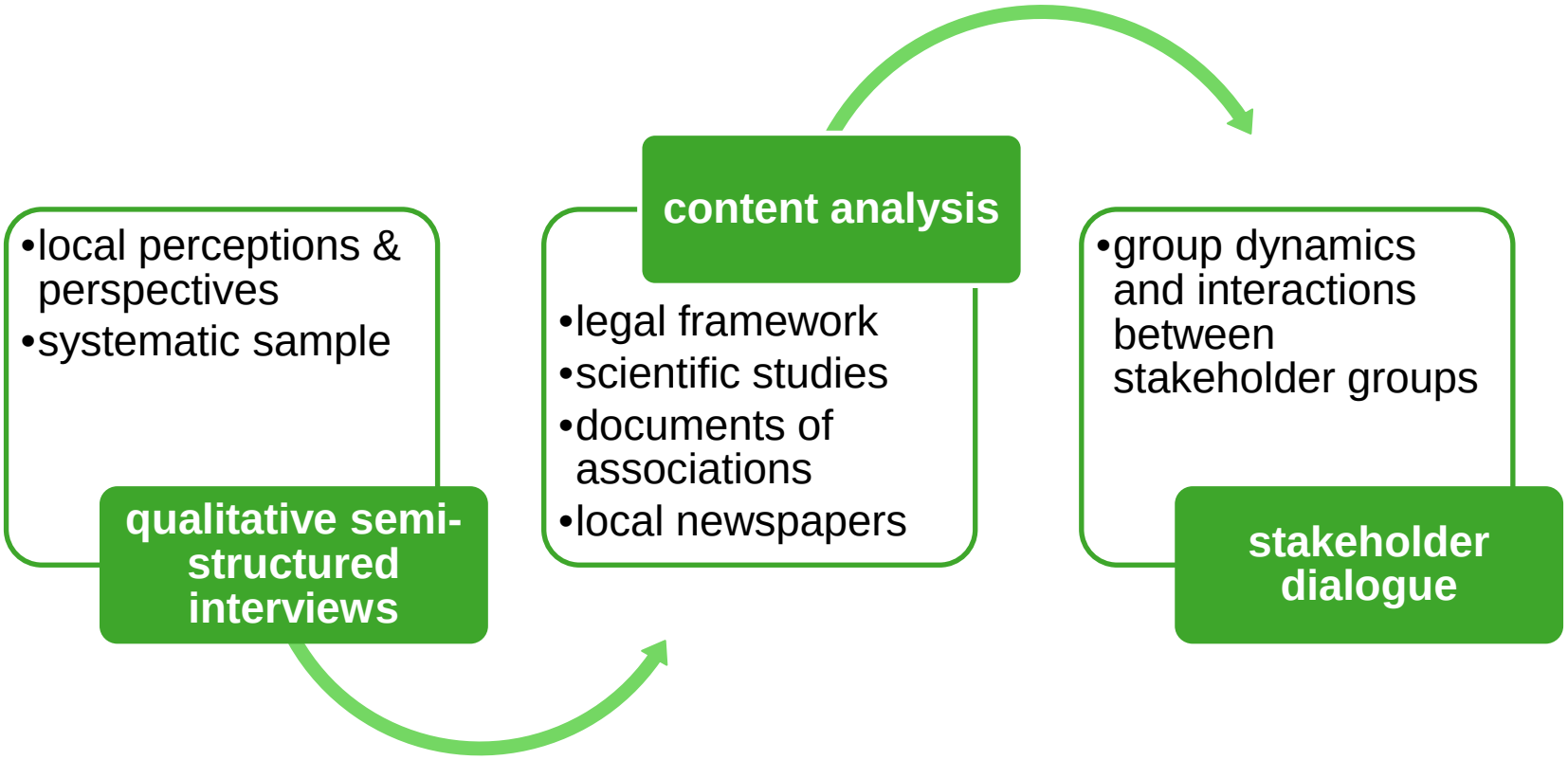
Dimensions of a **network perspective**

- **quantitative analysis**
  - centrality, central actor coalition, core and periphery actors
  - density, fragmentation
  - nodes and ties
    (cf. Healey et al. 2003; Schneider 2010; Robins et al. 2011; Salpeteur et al. 2017)
- **qualitative analysis**
  - formal and informal ties (cf. Dodgson et al. 2008; Wayne Gould 2012)
  - roles: characteristics of and demands on first-movers; ownership; intermediary actors
    (cf. Healey at al. 2003; Dodgson et al. 2008; Roloff 2008; van Merkerk et al. 2015)
  - negative ties: Veto-Players and Gatekeepers
    (cf. Rowley 1997; Tsebelis 2002; Pierson 2004)

Methodological approach: Nexus of qualitative methods – Triangulation



First results of the qualitative interviews: The need for new nexus in a multilevel setting

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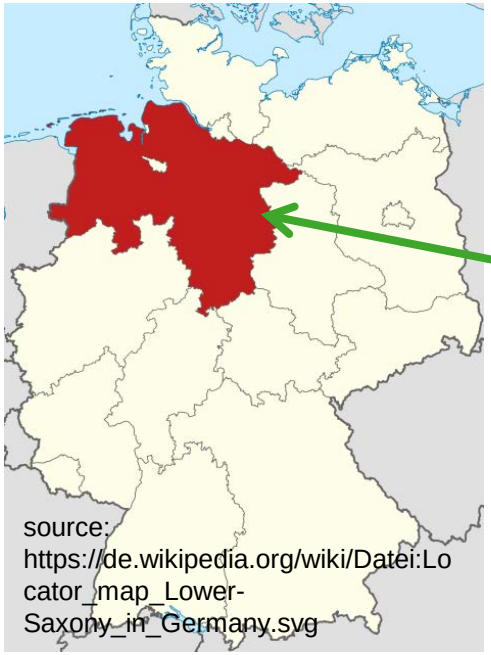
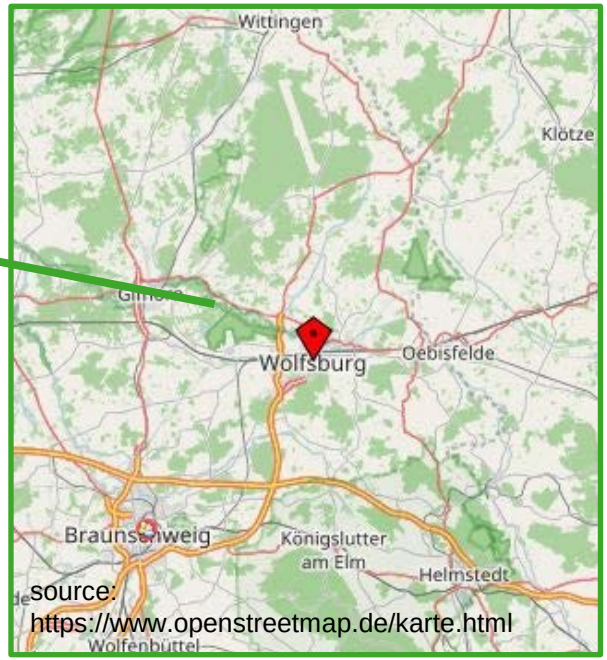
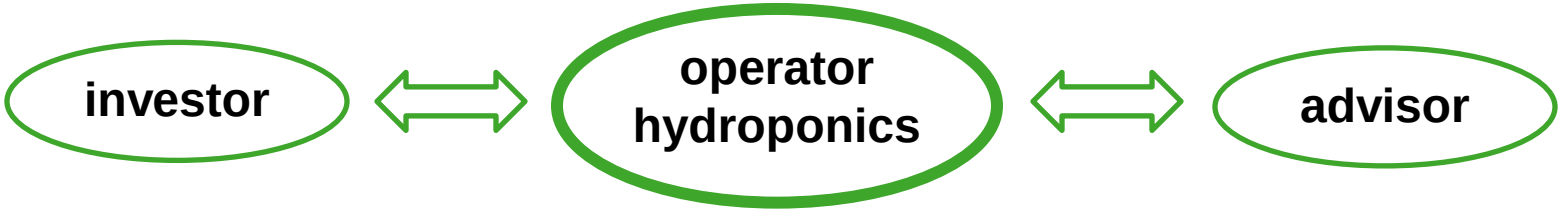
- Evidence of the qualitative interviews being part of the first case study: **Wolfsburg and its surrounding region**

Pilot installation Wolfsburg-Hattorf





First results: Identified central actor and horizontal forms of cooperation



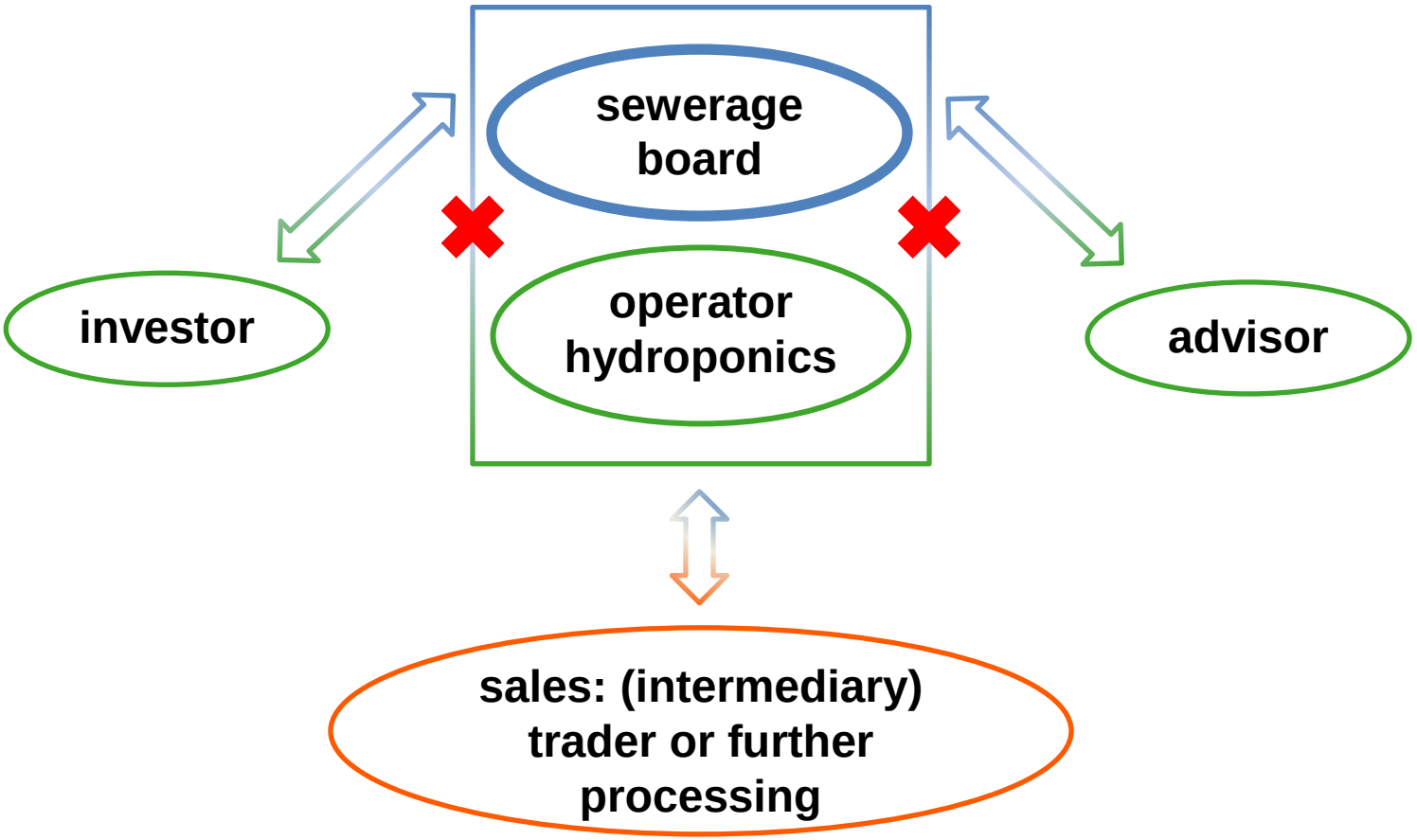
- larger business combinations like civil law associations (GbR) or cooperative

- vegetable gardeners
- horticulturists
- farmers
- food companies and food retailers

- formal
- informal e.g. peers

First results: Vertical forms of cooperation

Sewerage board with an in-house operator of hydroponic system



First results: Vertical forms of cooperation

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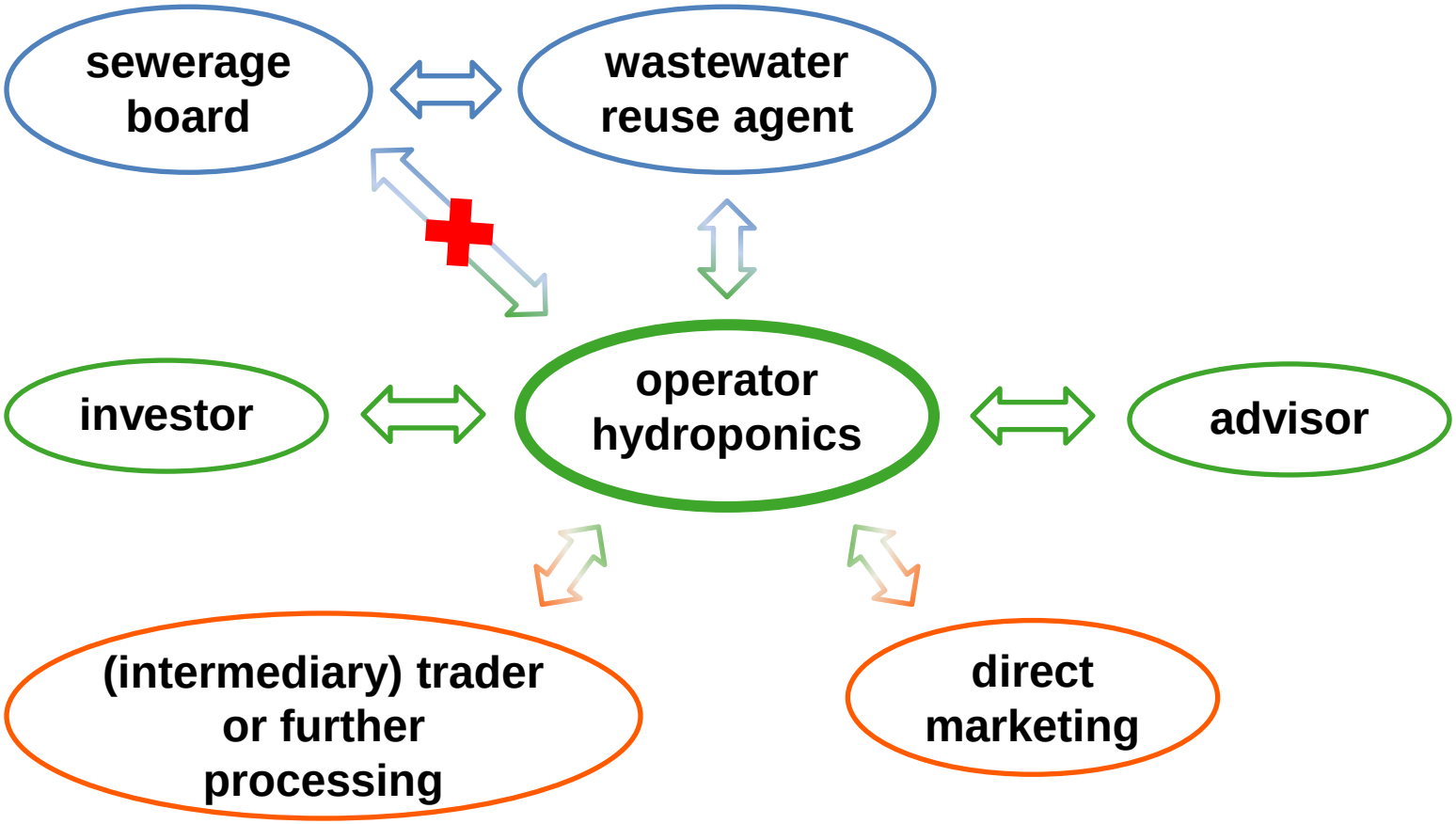
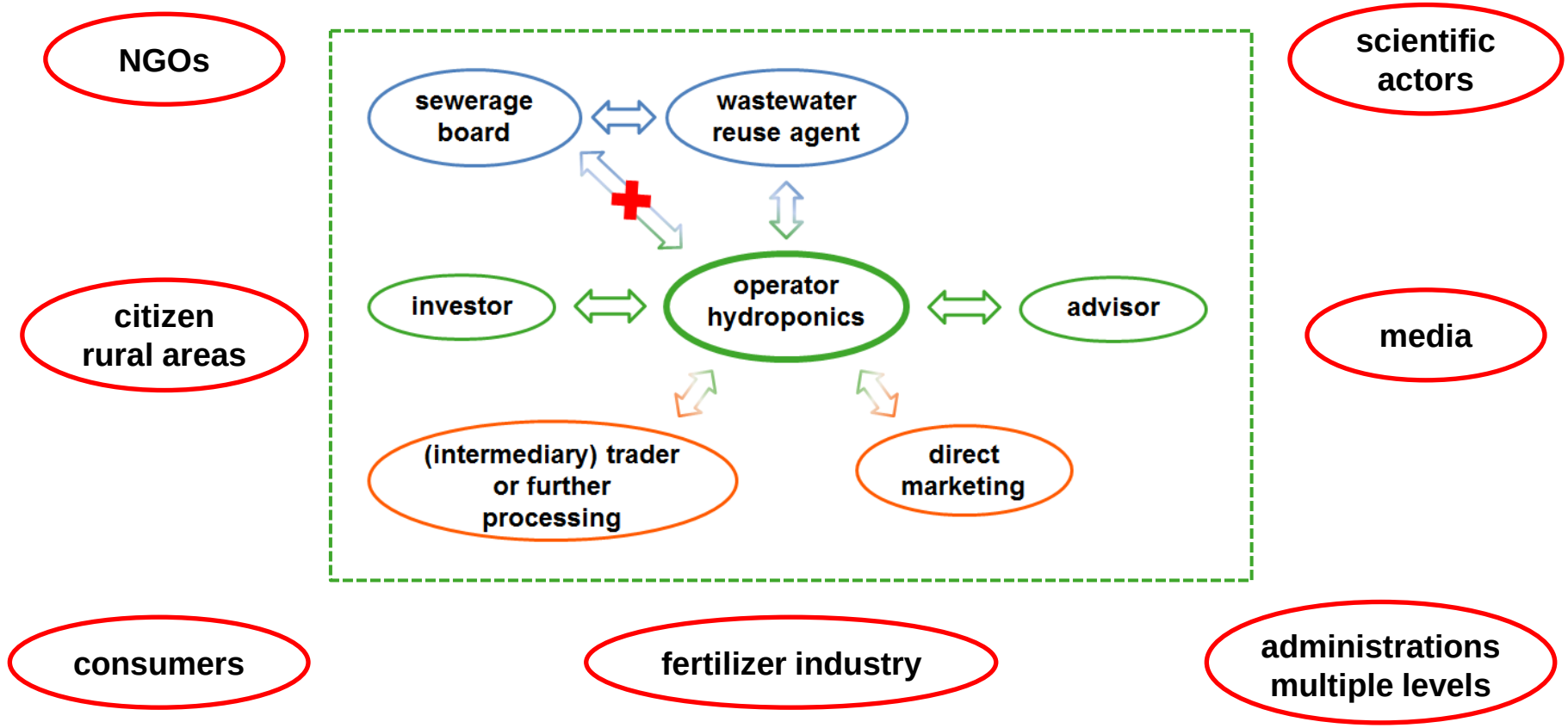
Social innovation: wastewater reuse agent



First results: The ‘core’ embedded into civil society



Findings and concluding remarks

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- Identified central actor = operator of the hydroponic system = vegetable gardeners, horticulturists and farmers
- Innovation‘s adoption through horizontal forms of cooperation between the operator of the hydroponic system, advisors and get together larger business combinations
- Sewerage boards without organizational capabilities to sell products; fees municipal utilities demand are bound to their service ➔ wastewater reuse agent newly installed intermediary actor
- Operator is confronted with two vertical forms of cooperation: (A) wastewater reuse agent, (B) (intermediary) traders and retailers
- ‘Core‘ is confronted with diverse Veto-Players and Gatekeepers within and beyond

- Further research demand: (A) Discurses on irrigation and wastewater reuse in agriculture; (B) Appropriate governance intruments to enforce cooperation

Thank you for your attention!


source: Paul Miehe, 2017

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Further information - visit our homepage:

➔ **http://www.hypowave.de**

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