Trade-offs and synergies between ecosystem services: Governance implications towards sustainable agricultural soil management

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Problem statement

- **Increasing pressure** on agricultural soils (urbanisation, extreme events due to climate change)

- **Various different claims and demands** on agricultural soils result in trade-offs between the soil services requested by society

- (Agricultural) soil governance = *multi-level* and *multi-actor* process (Weigelt et al. 2015).
Twofold objectives:

- Revisiting potential trade-offs and synergies between different a) provisioning services, b) regulating services and c) regulating and provisioning services in order to disentangle where trade-offs and synergies exist.

- Analysing in how far the trade-offs and synergies are triggered by management practices that are aligned with policies.
Methodology

German TALE case studies

Ilm River Basin

Weimar
Apolda
Illmenau

Lower Mulde River Basin

Magdel Subbasin

Lossa Subbasin

Saale River Basin

Mulde River Basin

Germany

Land use
- Arable land
- Forest - Deciduous
- Forest - Evergreen
- Forest - Mixed
- Pasture
- Range-Brush
- Urban
- Wetlands

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Our focus

- Selected ESS on agricultural land

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<th>Provisioning</th>
<th>Regulating</th>
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<td>Erosion control</td>
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<td>Clean water</td>
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Trade-offs and synergies (examples)

- Food/fodder
- Biomass for energy
- Erosion control
- Reduced nutrient loss
- Clean water
- Regulated water balance
- Pollination

Synergies: Reduced nutrient loss, Reduced greenhouse gas emissions
Trade-offs: Erosion control, Food/fodder
Role of policy measures linked to these trade-offs and synergies

- **Greening**
  - Buffer strips along water courses
  - Minimum soil cover
  - Reduced soil management

- **AECM**
  - Direct seeding
  - Catch crops
  - Flower strips

- **EU WFD**
- **Water law**
- **Nitrate Directive**
- **Nature protection law**
- **Soil protection law**

Greening AECM CC (GAEC)
Preliminary results

- Some policies are already regarded as of ecological importance
  - No need for additional policy measures (!), but adapt/specify existing ones
    - E.g. AECM: Flower strips, landscape elements
    - Reduce bureaucracy -vs- measurability

- There is more than policy measures:
  - Voluntary cooperations
  - Cooperation networks

- How to increase knowledge exchange, networks, cooperation,…?
Thank you!

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