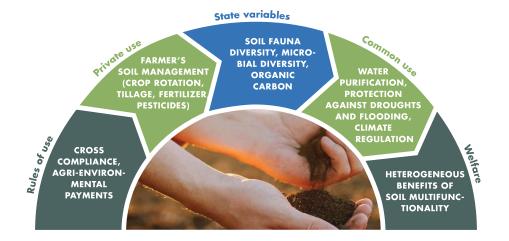


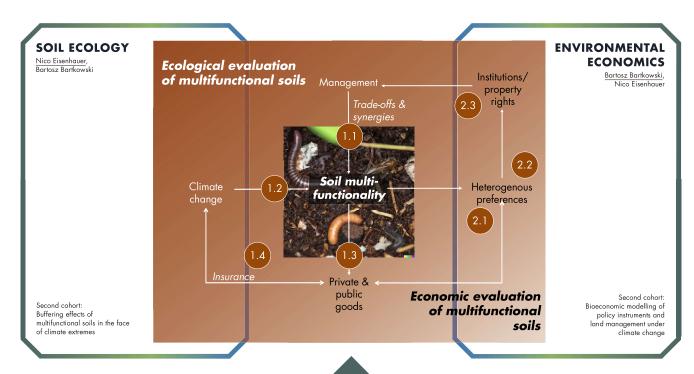


WHAT ARE THE HUMAN BENEFITS OF SOIL MULTIFUNCTIONALITY?

BARTOSZ BARTKOWSKI ENVIRONMENTAL ECONOMICS

NICO EISENHAUER SOIL BIODIVERSITY





SHARED METHODOLOGY:



UNIVERSITÄT LEIPZIG



ICP SOILS

BARTOSZ BARTKOWSKI, NICO EISENHAUER

ECOLOGICAL EVALUATION OF MULTIFUNCTIONAL SOILS

RESEARCH QUESTIONS

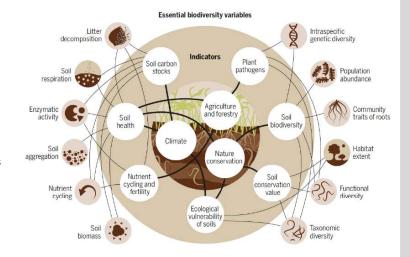
- What are the management options for and trade-offs between different soil-related ecosystem functions?
- What are promising mitigation actions for and natural insurance of multifunctional soils in a changing climate?

METHODS

- Multivariate and multifunctionality analyses
- Meta-analysis

PAPERS

- Paper 1.1: Identify management-related drivers and trade-offs of soil multifunctionality in agricultural contexts
- Paper 1.2: Predicted changes in and mitigation actions of soil functions related to public good/commons in a changing climate
- Paper 1.3: Identify most beneficial management practices for grasslands and agricultural fields in Central Europe
- (Joint) Paper 1.4: Interactions between soil multifunctionality and natural insurance



- WHAT ARE THE LINKS BETWEEN SOIL BIODIVERSITY, SOIL MULTIFUNCTIONALITY, AND HUMAN BENEFITS?
- WHAT DRIVES CHANGES IN THESE LINKS IN MANAGED (AGRICULTURAL) SOILS?
- WHAT ARE THE PREFERENCES OF DIFFERENT SOCIETAL GROUPS FOR SOIL BIODIVERSITY AND SOIL MULTIFUNCTIONALITY?
- WHAT CONSEQUENCES DO THESE HAVE FOR THE PROPERTY RIGHTS REGIMES AND POLICY FRAMEWORKS TO PROTECT MANAGED SOILS?

RESEARCH QUESTIONS

- What are the preferences of different societal groups for soil biodiversity and soil multifunctionality?
- What consequences do these have for the property rights regimes and policy frameworks to protect managed soils?

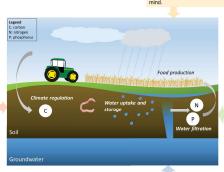
METHODS

- Deliberative monetary valuation
- Institutional analysis

PAPERS

- Paper 2.1: Uncovering public preferences for soil multifunctionality
- Paper 2.2: Understanding heterogeneity of preferences for soil multifunctionality
- (Joint) Paper 2.3: Effects of different groups' preferences on management and multifunctionality and consequences for institutional and property rights regime

Soils contribute to climate regulation. CO₂ from the air is initially absorbed by plants; after harvesting, plant residues as well as roots remain on the field and are subsequently processed by soil organisms (e.g., acarthworms) to form 'humus'. As a result, the carbon is bound in the soil for some time and does not enter the atmosphere. In addition to avoiding emissions, soils thus contribute to climate protection.



Soils help improve water quality through water filtration. Waler from precipitation seeps into the soil and is cleaned by it. It then enters groundwater and can later be used as (clean) drinking water, if soils do not furifill this function or do not do so to a sufficient extent, the water has to be treated and purified to a greater extent by technical means.

Soils can absorb and store water. They thus contribute to **flood** and **drought protection**. When soils can only absorb a small amount of water, e.g. due to compaction (as a result of driving over them with heavy machinery), the water runs off on the surface and enters water bodies directly. Technical flood protection measures must then be taken (e.g., construction of dikes and flood protection walls). For drought protection, longer-term water storage plays the main role; drought periods are more severe when there is little water stored in the soil.