

# Modes and impacts of sustainability research

Introducing 'MONA: Modes of research and their impact on scientific and societal project outcomes – A comparative analysis of 100 third-party funded sustainability-related research projects'

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# Promise and performance of transdisciplinary research



- ▶ Does transdisciplinary sustainability-oriented research deliver?
- ▶ What particular modes of research make a difference for research outcomes and for practical / societal outcomes?

# Structure of presentation

- 1 - Goals, concepts and methods in MONA
- 2 - Mapping the empirical basis: the funded sustainability research landscape in Germany

# **1 Goals, concepts and methods in MONA**

# Conceptual framework

## Context

- Interested non-academic actors
- Thematic issue / societal problem
- ...

## Research project

Projektphasen	2013	2014	2015	2016
1. Präzisierung des Untersuchungsdesigns				
(a) Konzeptspezifikation / Fallauswahl	■			
(b) Exploration I	■			
(c) Erweiterter Workshop (Projektdesign)		*		
(d) Exploration II		■		
2. Empirie Breitenstudie				
(a) Materialbeschaffung	■	■		
(b) Interviews		■	■	
(c) Kodierung der Fälle			■	■
(d) Qualitative & quantitative Auswertung				■
3. Empirie Tiefenstudie				
(a) Fallauswahl		■		
(b) Dokumentenanalyse			■	■
(c) Interviews			■	■
(d) Datenaufbereitung und Analyse				■
4. Synthese, Projektabschluss				
(a) Erweiterter Workshop Synthese				*
(b) Methodenübergreifender Vergleich				■
(c) Publikation der Ergebnisse				■
(d) Abschlusskonferenz				*

- Size & structural features
- Research goals
- **Research mode**
- Research process
- ...

- Funding context
- Research gaps
- ...

## Context

## Society

### Societal outcomes

- Problem solving
- Actor networks
- ...



### Academic outcomes

- Publications
- New insights and methods
- ...



## Academia

# Operationalising key concepts

## Research mode

- Who formulates the research questions (from within academia or problem-oriented)? Which disciplines are involved?
- To what extent is research multi- or inter-disciplinary?
- What is the project's focus? Problem-solving or generating academic knowledge?
- In how far is the project oriented to producing common-good solutions?
- Which actor groups have the opportunity to participate in the project, and when?
- How are different types of knowledge (e.g. academic and extra-academic knowledge) integrated? Are specific methods for knowledge integration used?
- Is the project being evaluated? Is there a peer-review and/or an expert-review?

## **Socially robust knowledge** (Gibbons, Nowotny)

- Acceptance
- External validity

# Core hypotheses on the relation between research mode and societal & academic outcomes

- H1 Topography of research modes:** We expect to find no strict distinction between 'transdisciplinary' and 'non-transdisciplinary' research projects; rather, we assume to find a continuum in research modes in actual research projects.
- H2 Research mode and project impacts:** An early and effective involvement of relevant non-academic actors fosters the acceptance and the societal impact of research outcomes.
- H3 Research mode and external validity:** An early and effective involvement of relevant non-academic actors fosters the external validity of research outcomes.
- H4 Knowledge integration methods:** The use of knowledge integration methods facilitates the mechanisms in H2 and H3.
- H5 Expert review:** The use of formative evaluation / expert review enhances both acceptance and external validity of generated knowledge.
- H6 Goal attainment:** The more transdisciplinary a project, the less the degree of attaining the defined research goals.
- H7 Career development:** The more transdisciplinary a project, the less successful the careers of involved researchers (including the degree of completed PhDs).

# MONA: First project to study a large sample of completed sustainability-related research projects

## Main research funders in Germany:

- *Federal Ministry for Education and Research (BMBF)*
  - programmatic research with theme-specific calls (similar to EU FP projects), mostly for collaborative projects involving multiple research institutions
  - Social-ecological research (SÖF) as “model” for transdisciplinary, sustainability-related research
- *German Research Foundation (DFG)*
  - “bottom-up” research for mostly smaller projects (similar to ERC projects)

## Selection criteria:

- Sustainability-related, minimum degree of interdisciplinarity, including social science
- Project start  $\geq$  1999 (start SÖF)
- Project end  $\leq$  2012 (to allow for completed outcomes)

### Large-N study:

100 completed research projects, including:  
50 BMBF (SÖF, WiN, ...)  
50 DFG (individual and collaborative research)

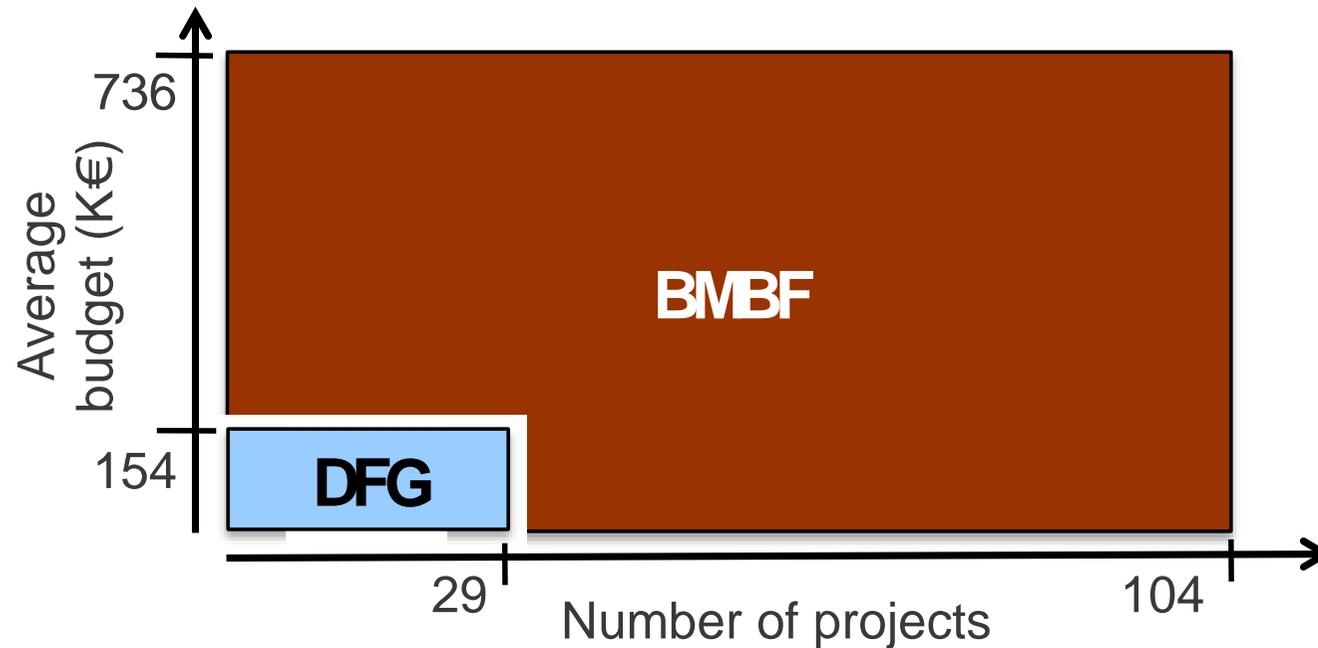
### In-depth study:

Approx. 8 projects  
4 DFG / 4 BMBF

## **2 Mapping the empirical basis: The funded sustainability research landscape in Germany**

# Mapping the sustainability-related research landscape

Our universe of cases – number and size of projects  
(133 in total + 8 large clusters)



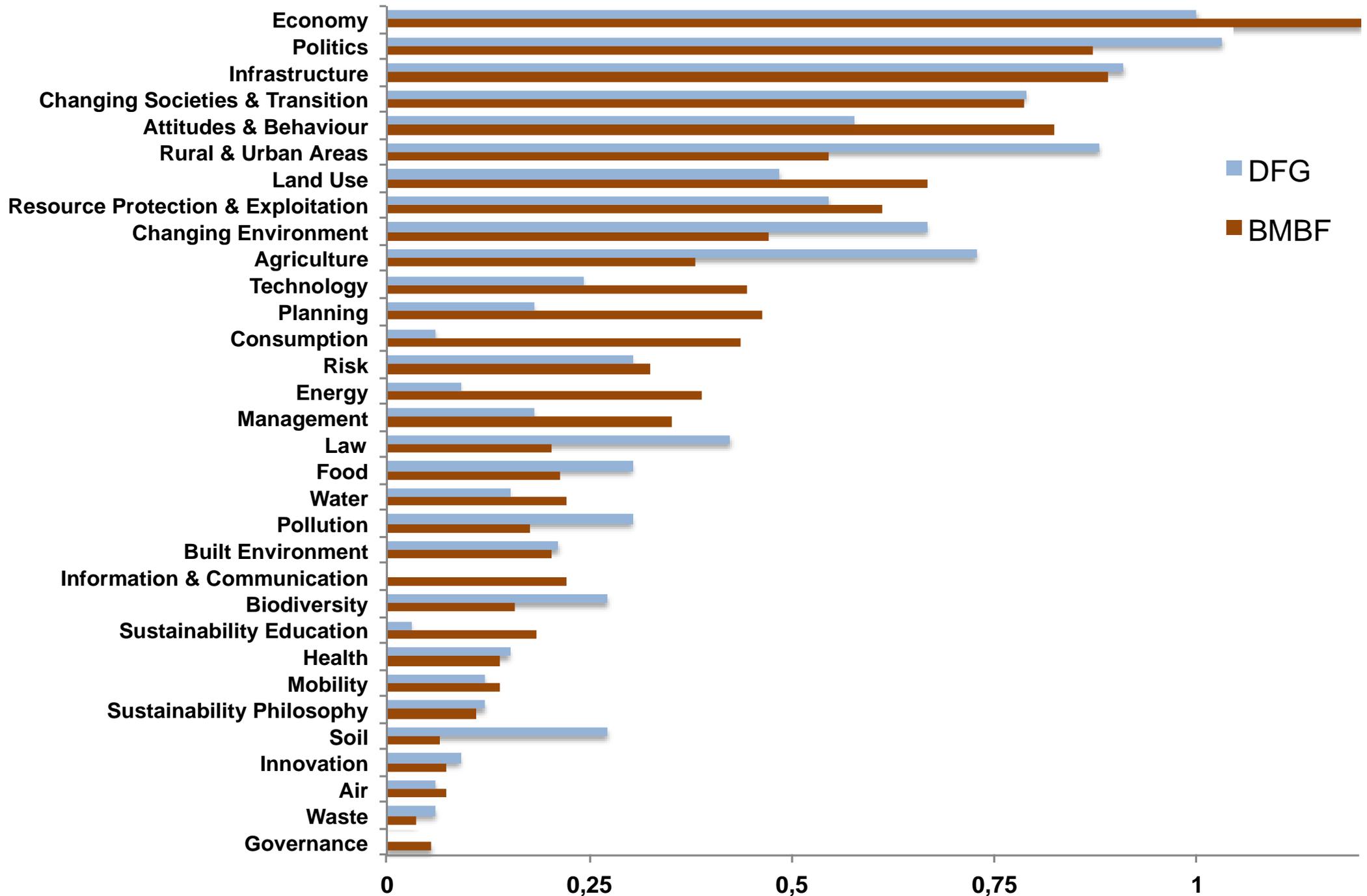
- + 4 large BMBF-funded clusters (approx. € 10 M each)
- + 4 large DFG-funded clusters (approx. € 10 M each)

## Project duration (average)

- BMBF: 3.7 years (clusters: 10.3 years)
- DFG: 3.6 years (clusters: 7.7 years)

# Sustainability-related research issues in DFG and BMBF projects

Own classification, scale from 0..2, based on project summaries of 141 projects and clusters



# Characterising research modes

Based on project summaries of 141 projects and clusters

**Collaboration:** BMBF projects involve on average 3.7 research institutions (no sufficient data for DFG)

**Non-academic lead:** 10.6 % of BMBF projects are led by non-academic institutions, DFG: none (because technically not possible)

**Non-academic involvement:** 64 % of BMBF projects explicitly aim to involve actors outside academia; only 1 out of 29 'normal' DFG projects do so; but: 2 out of 4 clusters

- 71 % of these BMBF projects involve governmental actors
- 84 % private (business) actors
- 46 % civic actors

## Explaining variance in research modes of BMBF-funded projects

- No significant correlations with project budget or duration
- Significant differences according to the specific BMBF funding line

→ Research mode largely determined by funding structure!

# Conclusions

- Claims of transdisciplinarity – hitherto still rather general and often ambivalent – can be operationalised into key concepts and key hypotheses.
- German sustainability-related research landscape is dominated by BMBF-funded – hence: programmatic – projects.
- Research mode appears largely determined by funding structure.
- But: Findings shown here very preliminary because based only on project summaries. We expect more nuanced results on research mode for DFG projects.
- Most important: Findings on relation of research mode and project outcomes still underway.

# Project summary analysis: methodology

Systematic document analysis following the Case Survey Method approach (Yin & Heald 1975)

- Identification of cases via search query: *nachhaltig\* OR sustainab\**
- Development of variable based coding scheme (covering 12 basic characteristics of research projects)
- Systematic coding of project descriptions applying the variable based coding scheme by two student research assistants
- Reliability test using Cohens Kappa (unweighted):

Reliability of measurement	Consistency of data	
Researcher-coder agreement k = .77 (min: .2; max: 1.0)	Intercoder agreement k = .79 (min: .3; max: 1.0)	Intracoder agreement k = .85 (min: .5; max: 1.0)