

## A Collection of Methods and Examples for Integration in Transdisciplinary Research

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## My personal 'transdisciplinary history'

- 1976 **Basic research** in physics of noise generation mechanisms
- 1980 **Applied research** on traffic noise reduction (in co-operation with the tyre industry, public transport companies etc.)
- 1990 Funding an **interdisciplinary research** network on sustainability studies (partners in Germany, Austria, Italy)
- 1992 Chairing some **inter- and transdisciplinary research** projects concerning sustainable mobility
- 1997 Reviewing **transdisciplinary research** programs and projects



Criteria ??

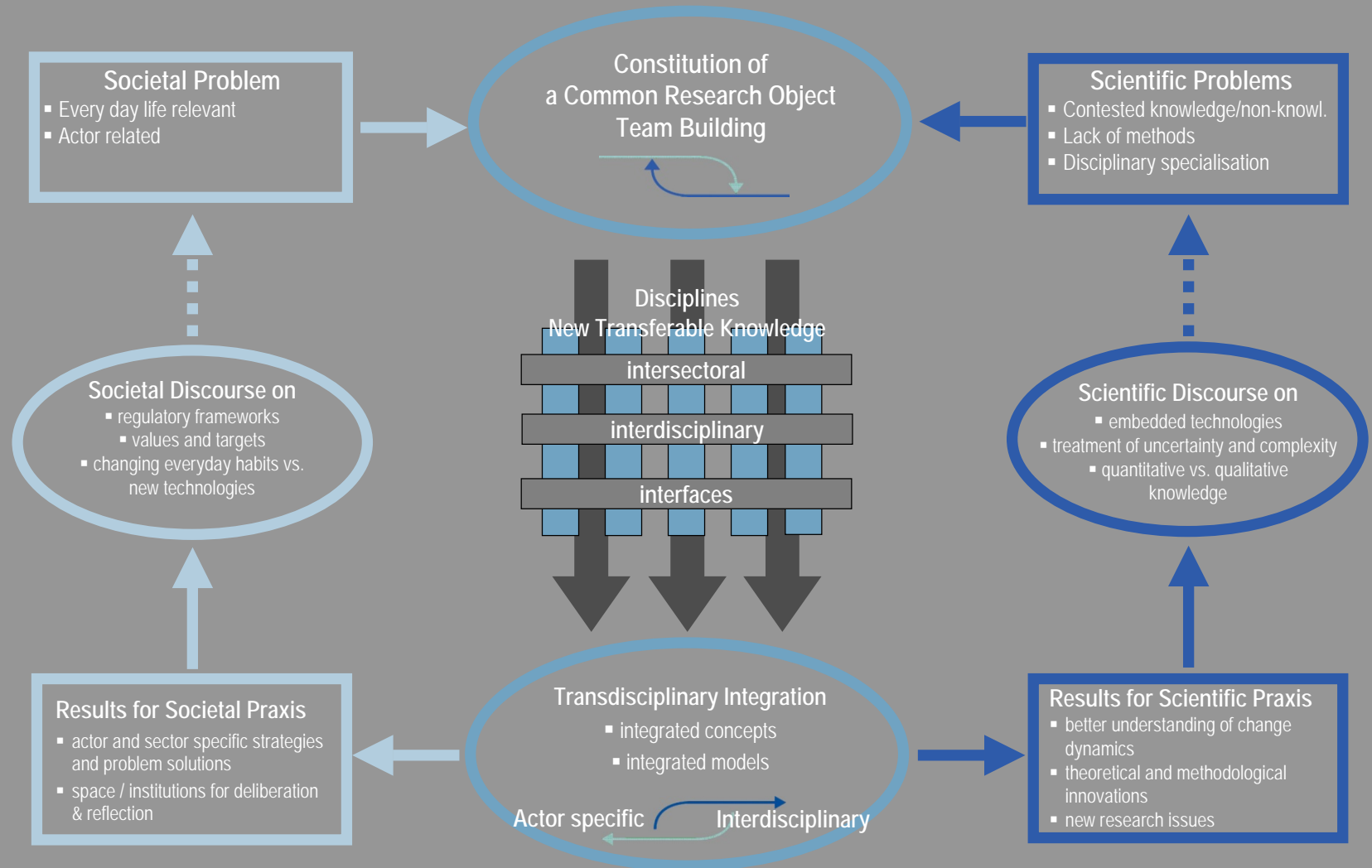


## Bottom up – Identifying Criteria and Methods

### ■ EVALUNET – Quality Criteria of Transdisciplinary Research

- Developing an own concept and theory of Transdisciplinarity / Transdisciplinary Research
- Designing an ideal type of a reflexive transdisciplinary research process
- Identifying, compiling, and structuring quality criteria

## The Reflexive Transdisciplinary Research Process – A Model





## Bottom up – Identifying Criteria and Methods

### ■ EVALUNET – Quality Criteria of Transdisciplinary Research

- Developing an own concept and theory of Transdisciplinarity / Transdisciplinary Research
- Designing an ideal type of a reflexive transdisciplinary research process
- Identifying, compiling, and structuring quality criteria
- **Formative, discursive Expert Review:** Evaluation process including evaluated researchers, evaluators and experts



## Quality Criteria

Matthias Bergmann, Bettina Brohmann,  
Esther Hoffmann, M. Céline Loibl,  
Regine Rehaag, Engelbert Schramm,  
and Jan-Peter Voß



### Quality Criteria of Transdisciplinary Research



A Guide for the Formative  
Evaluation of Research Projects

With a Foreword by Thomas Jahn

Öko-Institut e.V.



KATALYSE  
Institut für angewandte Umweltforschung



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## How Can We Meet the Quality Criteria ?

- Which are the methods to meet the **core** quality criteria?
- **Specific qualities of the transdisciplinary principle**
  - Real life problems
  - Interdisciplinary co-operation
  - Co-operation between scientists and experts from the problem field

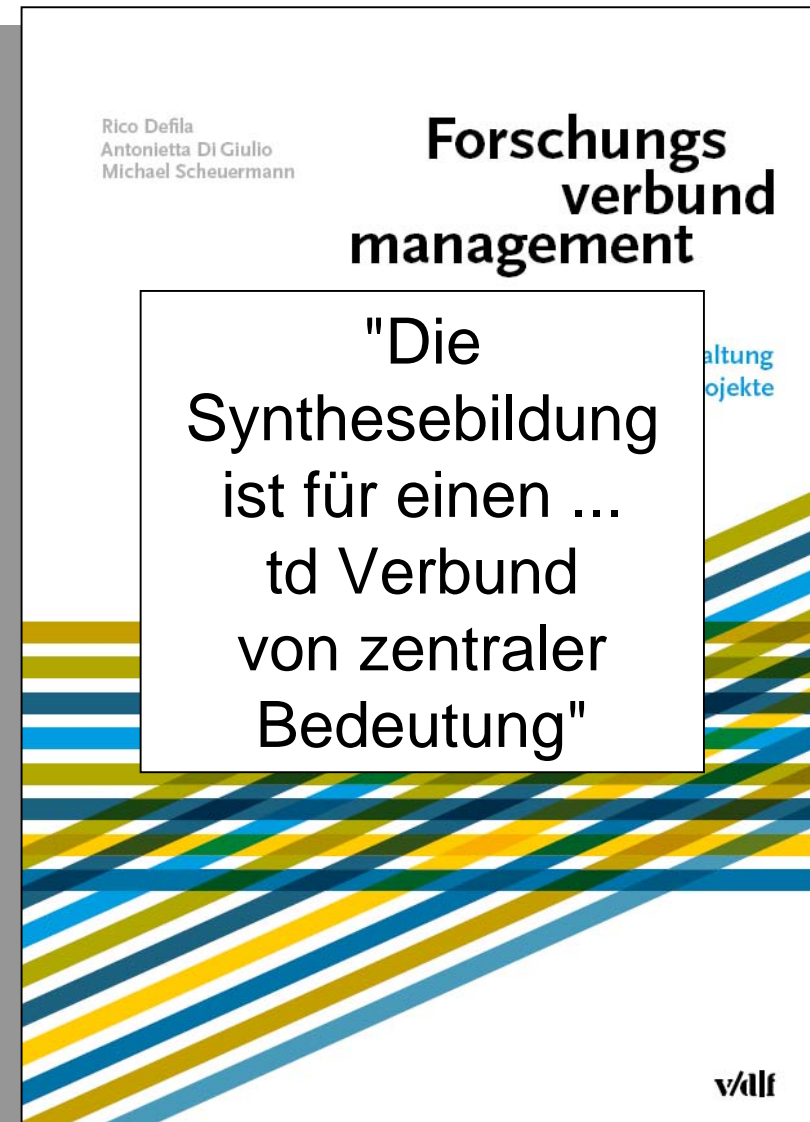
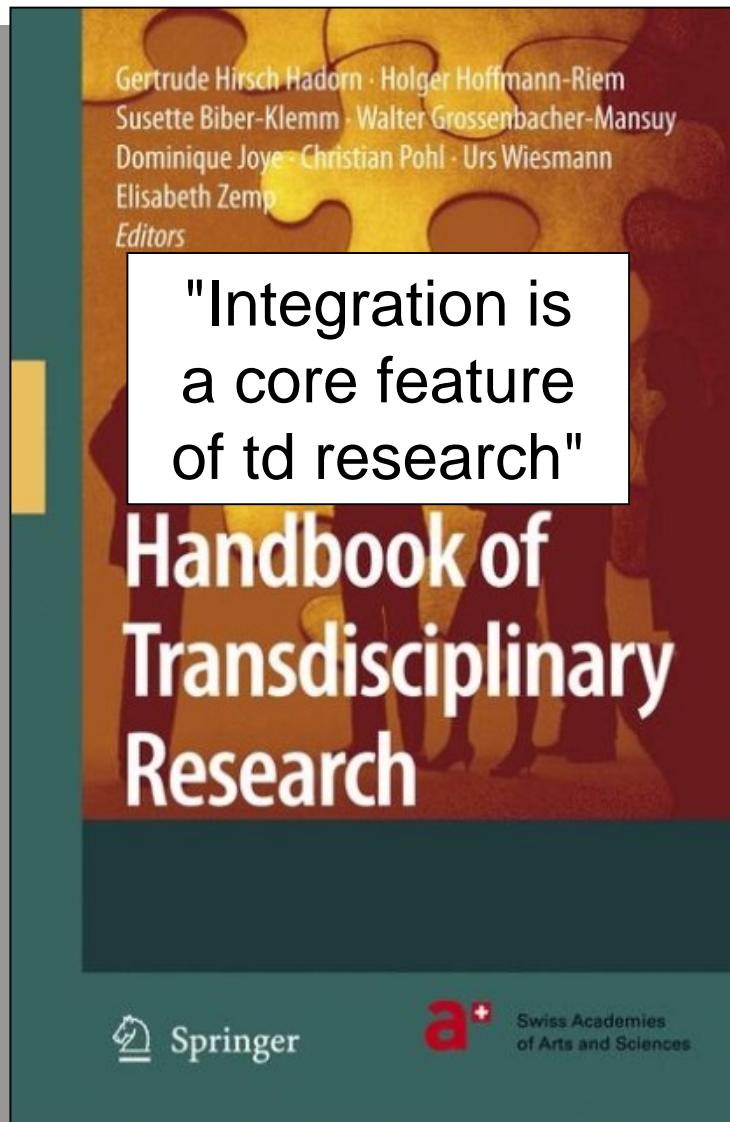


■ **Manifold *integrating tasks***

**tdPrax**

Describing integration methods and founding ***a method memory***

## What else happened ...?



Gertrude Hirsch Hadorn · Holger Hoffmann-Riem  
Susette Biber-Klemm · Walter Grossenbacher-Mansuy  
Dominique Joye · Christian Pohl · Urs Wiesmann  
Elisabeth Zemp  
Editors

"Integration is a  
core feature of td  
research"

## Handbook of Transdisciplinary Research



"Integration ist zentral  
für die Qualität  
td Forschung"

Matthias Bergmann,  
Engelbert Schramm (Hg.)

## TRANSDISZIPLINÄRE FORSCHUNG

Integrative Forschungsprozesse  
verstehen und bewerten

Rico Defila  
Antonietta Di Giulio  
Michael Scheuermann

## Forschungs- verbund management

"Die Synthesebildung  
ist für einen ...  
td Verbund von  
zentraler Bedeutung"

altung  
objekte

Methods of

Knowledge

Integration

Gertrude Hirsch Hadorn · Holger Hoffmann-Riem  
Susette Biber-Klemm · Walter Grossenbacher-Mansuy  
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## Reasons and Functions

### tdPrax

Describing methods of integration and founding *a method memory*

■ Ensuring and trading the knowledge base

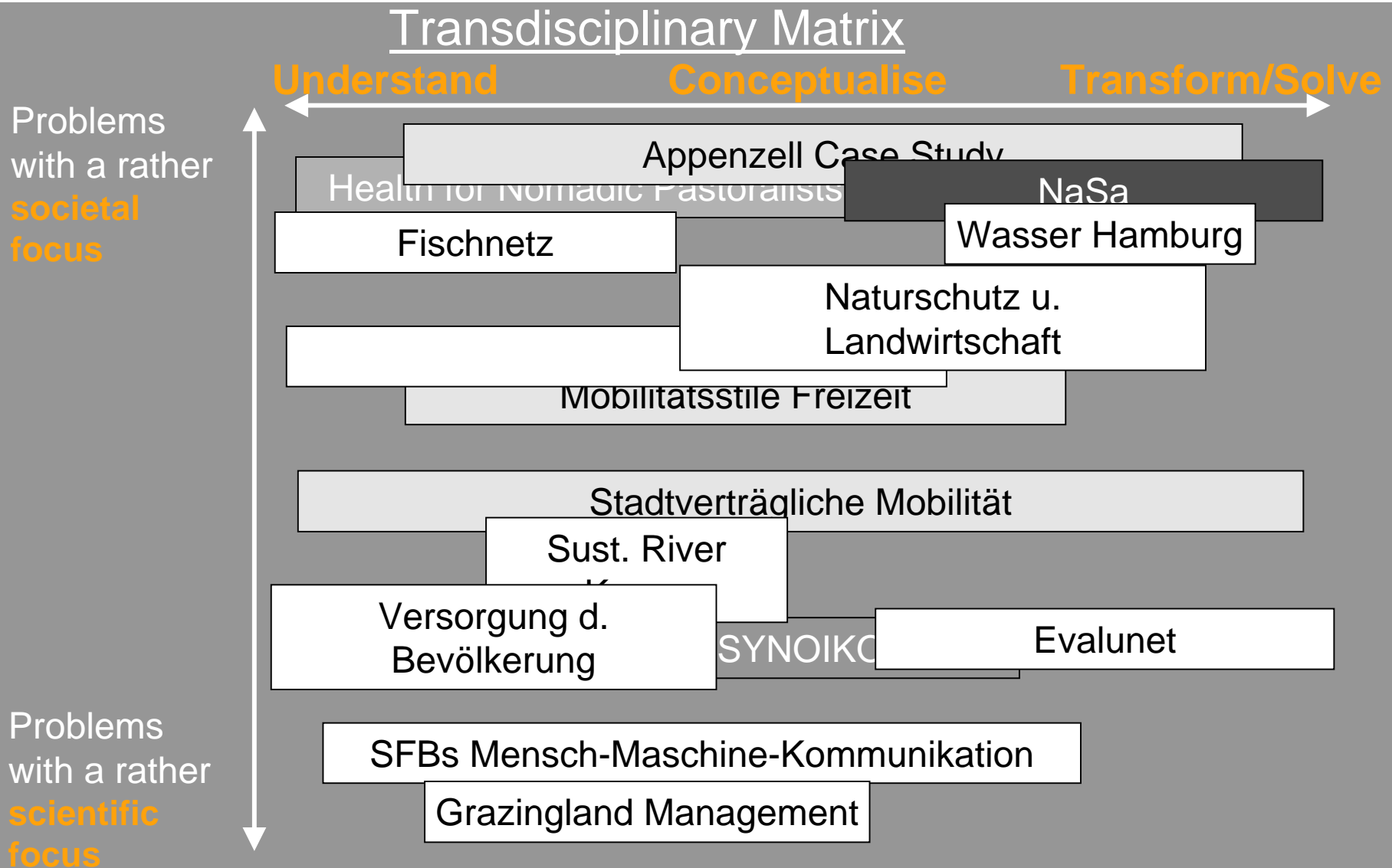
■ **Research related function (practical)**

- Impulses for integration in transdisciplinary research projects
- Specific support for td research teams

■ **Science related function (epistemological)**

- Impulses for epistemological innovation (Krohn, 2008)
- Impulses for a "transdisciplinary Denkkollektiv"  
(Pohl/Hirsch Hadorn, 2008)

## How to identify and describe methods of integration







## How to make method descriptions useful ...

### Problem:

The methods of integration are described

- in their specific societal problem context and
-  in the specific setting of co-operating disciplines and partners

Possibly difficult to reuse these methods for other problem contexts

- 
- Decontextualise the methods
  - Giving the compilation of methods an epistemic order
  - Optimising the usefulness of the collection by choosing a twofold description



## Solving the Dilemma Between Context and Generalisability

### "Methods of Transdisciplinary Research"

#### ■ The twofold description:

- Chapter II: Integration methods decontextualised – the methods and their analytical functions in an epistemic order  
43 single integration methods
- Chapter III: The transdisciplinary projects and their comprehensive integration strategies  
11 integrative project strategies / *stories of integration*



## Solving the Dilemma Between Context and Generalisability

### "Methods of Transdisciplinary Research"

#### Chapter II: Integration methods decontextualised – the methods and their analytical functions in an epistemic order

- a. Disambiguation of Notions / Concepts and Theoretical Framing
- b. Research Questions and Hypotheses
- c. Analysing, Using, (re)Developing of Integrative Scholarly Methods
- d. Integrative Assessment Methods
- e. Developing and Use of Models
- f. Integration by Means of Artefacts, Services and Products as *Boundary Objects*
- g. Procedures and Techniques of Integrative Research Organisation



## Examples for Decontextualised Methods

### a. Disambiguation of Notions / Concepts and Theoretical Framing

- Interdisciplinary and disciplin-oriented **clarification of notions from the problem field**: e.g. "space" in the language of engineering, sociology, physics, geography etc.
- **Heuristics for an interdisciplinary approach** to the description of the problem: e.g. the metaphore of a net (mobility, urban planning etc.)



## Examples for Decontextualised Methods

- a. Disambiguation of Notions / Concepts and Theoretical Framing
- b. Research Questions and Hypotheses

- **Formulation of transdisciplinary hypotheses:** e.g. to integrate descriptions of the problem from various disciplines and practitioners as the basis for modelling



## Examples for Decontextualised Methods

- a. Disambiguation of Notions / Concepts and Theoretical Framing
- b. Research Questions and Hypotheses
- c. Analysing, Using, (re)Developing of Integrative Scholarly Methods

- **Development of interdisciplinary methods:** e.g. the so called *Mobility Style Analysis* (sociology/social empiric studies and transportation science and planning)



## Examples for Decontextualised Methods

- a. Disambiguation of Notions / Concepts and Theoretical Framing
- b. Research Questions and Hypotheses
- c. Analysing, Using, (re)Developing of Integrative Scholarly Methods
- d. Integrative Assessment Methods

e.g.

- **multi-criteria assessment**
- transdisciplinary **formulation of guiding principles (*Leitbild*)**
- assessment through a ***Bayesian Probability Network***
- ***Formative Evaluation***



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- b. Research Questions and Hypotheses
- c. Analysing, Using, (re)Developing of Integrative Scholarly Methods
- d. Integrative Assessment Methods
- e. Developing and Use of Models

e.g.

- **conceptual models** (linking theoretical framework with empirical studies)
- **system models**
- **prognostic models**
- **computer simulation**



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- c. Analysing, Using, (re)Developing of Integrative Scholarly Methods
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- e. Developing and Use of Models
- f. Integration Through Artefacts, Services and Products as *Boundary Objects*

e.g.

- common ***Boundary Object*** (such as the famous Star & Griesemer example of the Berkeley's Museum of Vertebrate Biology)
- **products** such as prognoses, market analyses, scenarios etc.



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e.g.

- **principles of advocates** for a discipline and **mentors**,  
interdisciplinary **tandems**
- **integration of stakeholders**, **discursive development of products**



## Solving the Dilemma Between Context and Generalisability

### "Methods of Transdisciplinary Research"

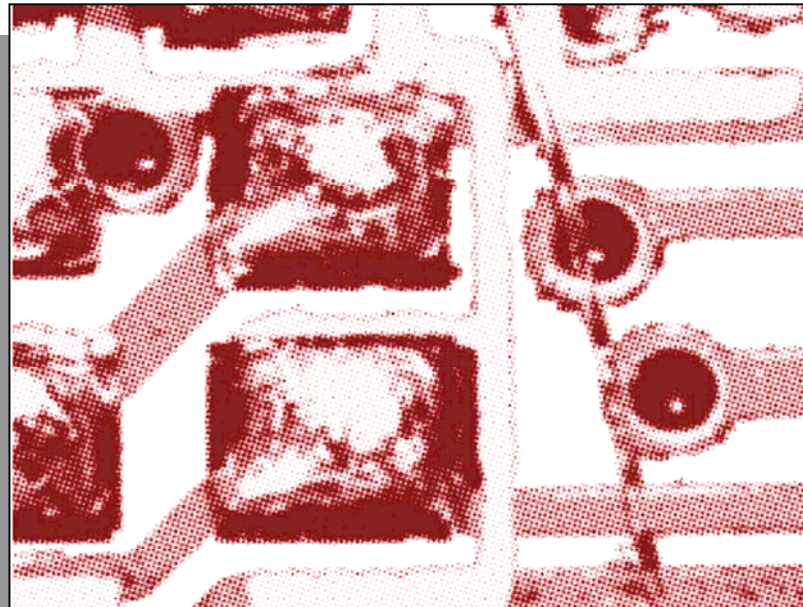
#### Chapter III: The td projects and their comprehensive integration strategies

#### The model projects achieve integration by means of ...

- a. ... the interdisciplinary development of a theory and a conceptual model
- b. ... building of hypotheses in co-operation with stakeholders
- c. ... interdisciplinary categorial systems and iterative research processes
- d. ... the development of an artefact
- e. ... the development of a guiding principle ('Leitbild')
- f. ... mutual learning in an iterative process
- g. ....

## Testing the material and the concept

- Successful tests with two transdisciplinary research teams:  
developing integration strategies and choosing appropriate  
integration methods for their research projects



**Seminars and coaching processes** for support in conceiving of integration concepts, integration methods etc.

## **METHODEN TRANSDISZIPLINÄRER FORSCHUNG**

Ein Überblick mit Anwendungsbeispielen

**campus**



## Consequences and follow-up activities

- **More td-nets – Transdisciplinarity has to have a place of concentration and lots of places in teaching and research**
- **Project on developing an academy / a college / think tank**
  - **for research on td epistemology, methods, concepts ("Science and/in/for society") etc.**
  - **for development of td curricula for undergraduates and post graduates – integrating humanities, social sciences, natural sciences, engineering**
  - **networking: Schneidewind, Elkana, Krohn, ... and a number of universities and research institutions**