



Integrated Knowledge for Sustainable Innovations – a Transdisciplinary Perspective

**Green / EFA-Conference “What Science – What Europe?”
Brussels, 2-3 May 2005**

Thomas Jahn

Institute for Social-Ecological Research (ISOE)

Frankfurt am Main, Germany

Background

The Institute for Social-Ecological Research (ISOE) - www.isoe.de

- is an innovative non-profit SME in the field of Sustainability Research
- follows a problem- and actor-oriented research approach
- does research in main social-ecological problem areas such as
 - water & sustainable planning,
 - mobility & transportation,
 - consumption pattern & lifestyle research,
 - demographic changes & supply systems,
 - gender & environment
- aims to generate transdisciplinary knowledge which can help to transcend the boundaries between the disciplines and between science and society

Overview

1. Why Transdisciplinary Research is needed
2. Misunderstandings concerning sustainability and research in FP7
3. Missing points in the proposal of FP 7
4. Suggestions for changes

5. Annex
5. Cross-cutting research for a new water economy – a practical illustration

FP 7 as a bridge between Gothenborg and Lisbon

“The Lisbon strategy is, in effect, the EU’s programme to **solve the equation between economic growth, competitiveness and employment on the one hand, and social and environmental sustainability on the other hand**. Lisbon is about sustaining the European model of society for present and future generations, in the face of growing global competition and ageing populations.

(. . .)

At the same time, **knowledge is a major component of the European way of life. It supports sustainable development**: the improvement of living standards, quality of life, health and the environment all depend greatly on the advancement of knowledge and its applications to address the challenges faced by society.”

COM (2005) 118: “Building the ERA of knowledge for growth”, Brussels, 06.04.2005, page 2
(marked in bold by Th. Jahn)

Why Transdisciplinary Research is needed

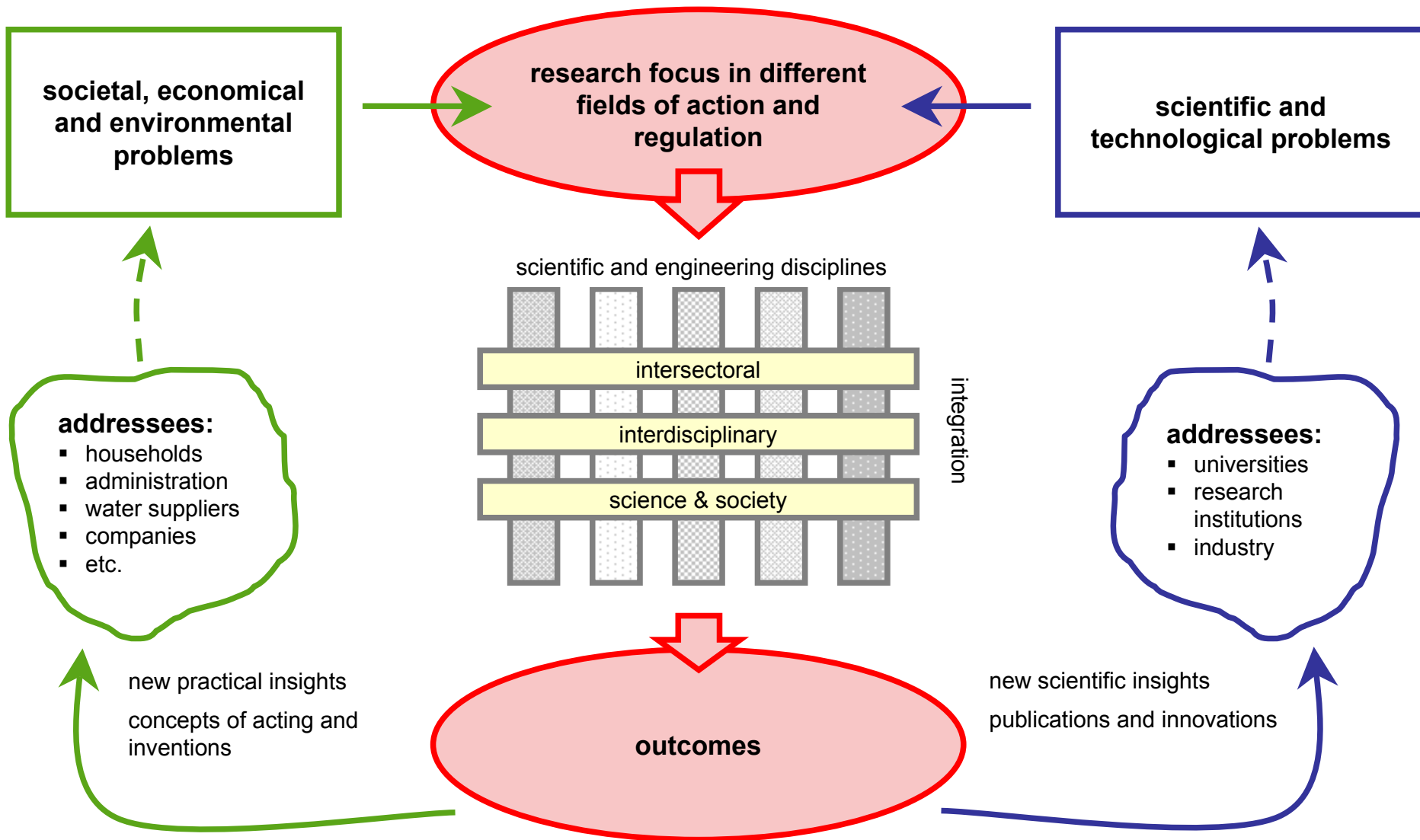
- Transdisciplinary Research (TdR) becomes increasingly important in the context of
 - Sustainable Development Research
 - Technology Assessment and Global Change Research
 - new mode of knowledge production in heterogeneous research cooperation with industry and societal groups as partners
- TdR is disciplinary based and adds value by working out twofold integration problems
 - integrating societal (political, economical, ecological) problem understanding in R&D agenda setting and research practice
 - integrating scientific knowledge of the natural, social and engineering sciences
- TdR generates a new integrated knowledge base for solving today's major problems
 - strengthening collaboration between disciplines using interdisciplinary methods and concepts
 - enhancing cooperation between different research institutions, including the non-profit and non governmental sector of the European research landscape
 - starting research processes with an inclusive agenda setting at the interface of politics, society and sciences
 - focussing on adaptive problem solutions for different actor groups on a social, spatial and political level

Misunderstandings concerning sustainability and research in FP 7

- Sustainability is regarded only as a political and normative concept for subjects of minor interest, in collaboration with developing countries or in the globalisation discourse and not seen as a crucial problem of science and research
- Transdisciplinary research is reduced to a (multidisciplinary) management task and not understood as a challenging problem of a twofold knowledge integration
- Cognitive integration processes in research are seldom addressed and not seen as a strong request for developing specific methods and research concepts to enable creating a new knowledge base



Added value of the Transdisciplinary Research Process



Missing points in the proposal of FP 7

- Balancing growth *and* sustainability on all levels (specific programmes, themes, working programmes, calls, evaluation, simplification, ERC)
- Considering transdisciplinary research as the most appropriate approach for cross-cutting research from the very beginning (agenda setting, research process, outcome)
- Understanding knowledge integration as a crucial scientific competence and potential for innovation and better problem solutions
- Regarding Sustainability Science as part of frontier research
- Including non-profit SME as innovative partners within the ERA
- Developing evaluation criteria for Sustainable Development Research

Suggestions for Changes

- Implementing cross-cutting research in all nine themes
- Making the transdisciplinary approach more explicit, where sustainability and environmental issues already are addressed (Food, Mobility, Environment, Socio-Economy and Humanities)
- Increase of the funding budgets for Science and Society, Environment and Socio-Economic Sciences and Humanities
- Reserving 10% of the given budget for Collaborative Projects to encourage and stimulate TdR Capacity Building within ERA
- Establishing expert review for adequate evaluation of transdisciplinary research proposals
- Working out of criteria for good TdR
- Strengthening the competitiveness for non-profit research SME by establishing appropriate funding schemes according to state-funded research organisations

Cross-Cutting Research for a New Water Economy - a practical illustration (1)

■ What is the problem?

- today's coupled systems of fresh water supply and conventional sewage plants are *not sustainable*:
 - consumption of too much water and energy
 - destruction of nutrients (phosphate, nitrate) to achieve purification
 - cost-intensive, subsidised and long-lasting investment cycles
 - hardly adaptable to demographic changes, new risks of micro-pollutants and the polluter-pay-principle
- *perfectionism* of end of pipe technologies as the dominant problem solution
- *high need for rehabilitation* in the water infrastructure sector (Germany: 130 Bn € / 10 years)

■ What is the goal?

- understand the need for rehabilitation as a *chance* for developments of and investments in new and sustainable concepts
- establishing a *new and sustainable water economy* which is
 - open to transformations and highly adaptive to changing conditions
 - embedded in societal, economical and ecological needs and constraints

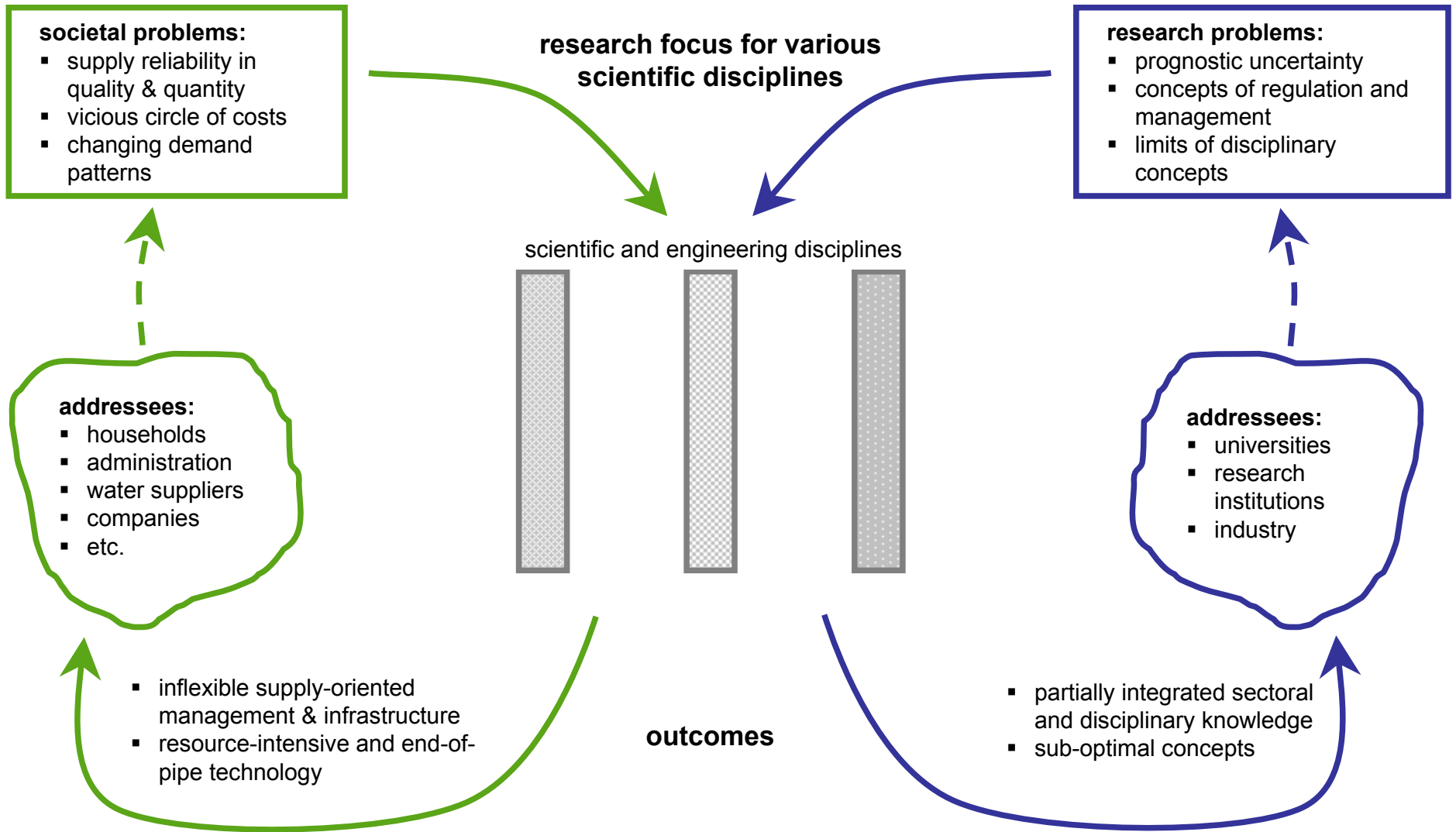
Cross-Cutting Research for a New Water Economy

- a practical illustration (2)

- What are the prerequisites of research?
 - *basic research* on knowledge generation and development of new concepts taking complexity and prognostic uncertainties into account
 - consequent *integration* of different sectors and disciplines
 - energy, public water supply, industry, agriculture, regional and urban development, resource management, infrastructure planning
 - engineering sciences, natural sciences, material sciences and nanotechnology (membrane technique), information sciences (pervasive computing in regulation and control), socio-empirical research
 - utilisation of *synergies* for innovations in various fields of action: nutrition, health, agriculture, new technologies
 - understand *waste water as a resource* for nutrients and energy production (methane)
- What are the outcomes?
 - scientific results for socio-technological *innovations*
 - *decision support* for policy-making and resource management
 - *impulses and benefits* for industry, SME, stakeholders
 - *excellence* in integrated water research and worldwide leadership in technology and know-how



Multidisciplinary Research Process (3)





Transdisciplinary Research Process (4)

