DIALOGUE AS A TOOL FOR SOCIETAL VALORISATION OF ENVIRONMENTAL AND INDUSTRIAL BIOTECHNOLOGY

TJ SCHUITMAKER, A. ROELOFSEN, T. DE COCK BUNING , J.E.W. BROERSE
ATHENA, VU UNIVERSITY AMSTERDAM

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Centre for Society and Genomics

VU UNIVERSITY AMSTERDAM
Faculty of Earth and Life Sciences

CONTENTS

- New CTA process: combination of analysis of systemic barriers for innovation with interactive learning approach (science-society dialogue) => a reflection-action method

- But first:
  - Societal valorisation and BE-Basic
  - Ecogenomics consortium and barriers
  - Method for analysing barriers

- Results first phase and next steps

REFLECTION-ACTION PROCESS

Two Methods combined:

Developed in the field of sustainability transitions

Piloted on ecogenomics

1) System analysis

Identify and unravel how power relations, institutional structures and system dynamics impede innovations.

2) Science-society dialogue

Scientists and societal stakeholders jointly identify win-win design options.

SOCIETAL VALORIZATION

- Scientific knowledge that creates societal value by
  - contributing to important societal themes, e.g. sustainable development, health
  - addressing societal problems, e.g. pollution, climate change, new emerging diseases
  - supporting development of new profitable technologies
- Requires successful implementation or embedding of scientific knowledge in society

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SOCIETAL VALORIZATION AND BE-BASIC

- International public-private partnership, funded by the Dutch government between universities, research institutes and industries of various scales in the field of sustainable chemistry and ecology
- R&D to contribute to a bio-based economy/society and sustainable development (societal valorization)
- In a variety of ways: e.g.
  - Disease-suppressive capability of soils to reduce use of pesticides in agriculture
  - Bio-essays for risk assessment of toxic compounds
  - Development of biofuels to reduce use of fossil fuels
  - Use biological compounds for industrial production to reduce use of chemicals and develop new products

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BARRIERS FOR SOCIETAL VALORIZATION

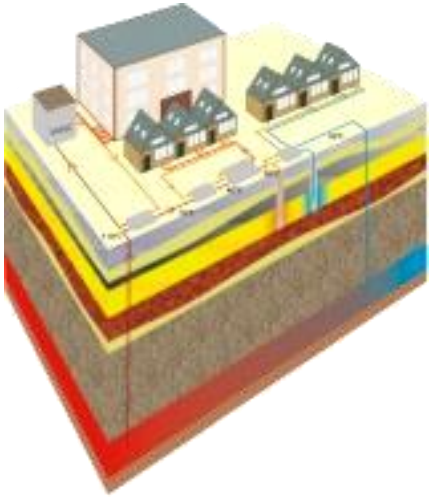
- Sometimes implementation is smooth, but often not
- Resistance of societal stakeholders – users, consumers, policy makers

"It seems the system is against us!"

EARLIER CASE: DUTCH ECOGENOMICS CONSORTIUM

- 2004 => six year R&D collaboration to explore use of genomics science and technologies on soil ecosystems

- Especially monitoring tools for soil health, for example:



Effects of WKO (heath-cold storage) on soil ecosystem?

Effects of WKO on ecological functions?

Can WKO and Bioremediation be integrated?

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=> CTA done to improve **societal match**

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CTA AND THE DUTCH ECOGENOMICS CONSORTIUM

CTA aims at:

- Actively involving all relevant actors in an open exchange, planning, action and reflection process
- Integrating different types of knowledge (scientific and practical) => transdisciplinarity
- Reflection, anticipation and learning
- Aims for better societal embedding of emerging S&T
- Methods => Dialogue process

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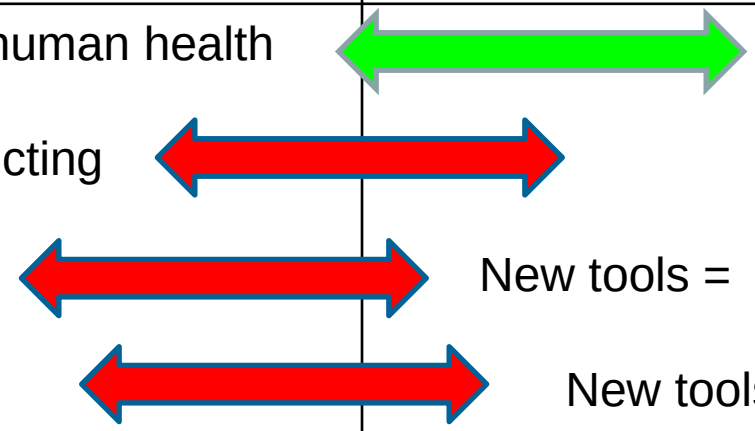
RESULTS: DIALOGUE ON SOIL POLLUTION

Researchers	**Users/policy**
Ecosystem health, human health	Human health
Measuring and detecting	Predicting risks
Develop new tools	New tools = mission impossible
Scientific validation	New tools need ‘confidence’ and ‘experience’



- Positions of users and policy-related participants were ‘shared’
- Positions of researchers and other participants largely remained ‘untuned’
- Researchers seemed to understand the different points, but mainly challenged them

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RESULTS: DIALOGUE ON SOIL POLLUTION

- The dialogues created room to come up with innovative opportunities for ecogenomics
- Participants broadened their network and developed new partnerships
- Results point to:
  - Difficulty and importance of linking dialogue processes with policy dynamics
  - Challenge of translating the results of dialogue processes beyond its protected space
  - Need for flexible within research programmes
  - Need for facilitating follow-up

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NEW REFLECTION-ACTION PROCESS NEEDED

- Most important lesson: to prevent barriers and make use of opportunities the interaction with stakeholders needs to start early

- But:
  - How to investigate barriers?
  - How to know which stakeholders to include?
  - How to understand barriers?

=> the UPP framework

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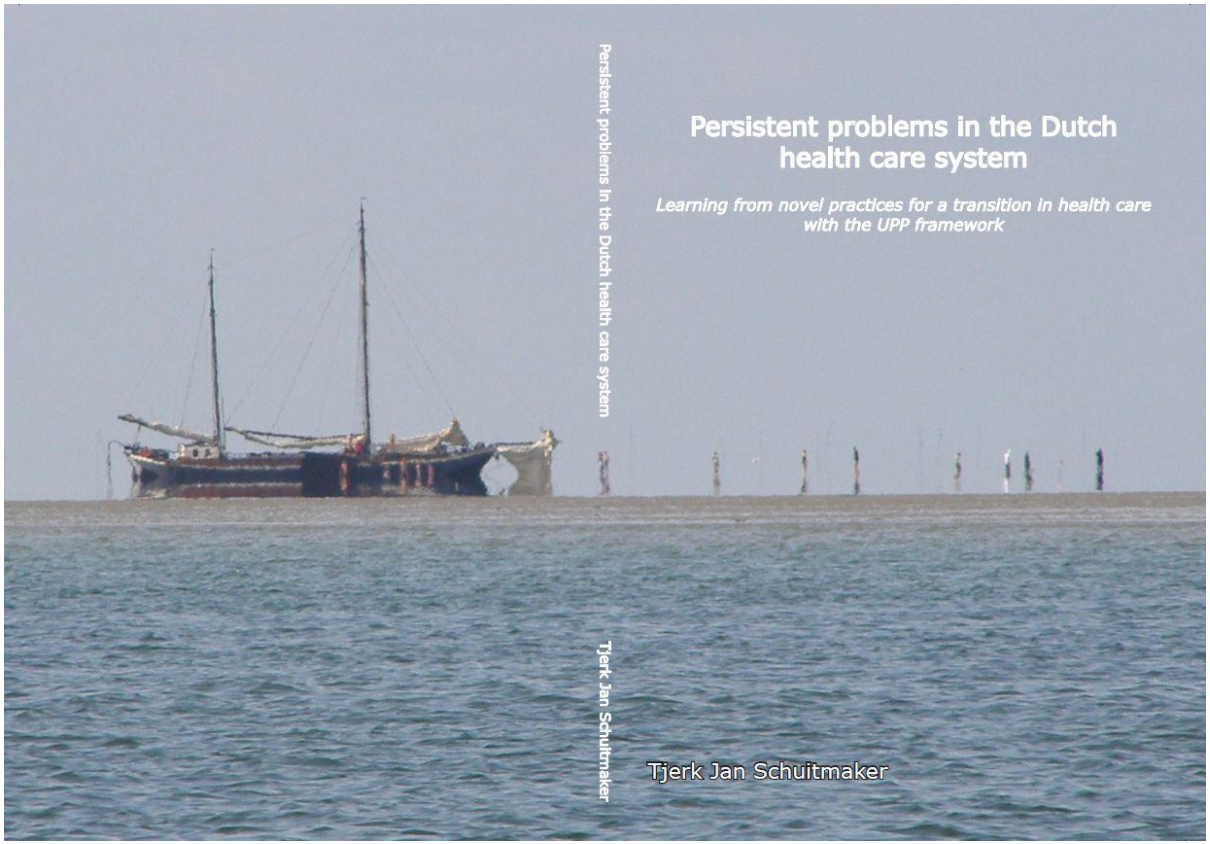
SYSTEM ANALYSIS – BARRIERS FOR INNOVATIONS

Framework developed in health care to identify and unravel barriers for innovations that contribute to sustainable health care system



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REFLECTION-ACTION PROCESS

Phase 1: Actor guided system analysis, BE-Basic actors

. Identifying and unraveling barriers

. Identifying relevant actors

Phase 2: Deepening understanding, societal actors

. Exploration visions other relevant actors

. Barriers from their perspective

Phase 3: Action-oriented integration, BE-Basic and societal actors

. Constructing alternative implementation routes

. Science-society dialogue in effect

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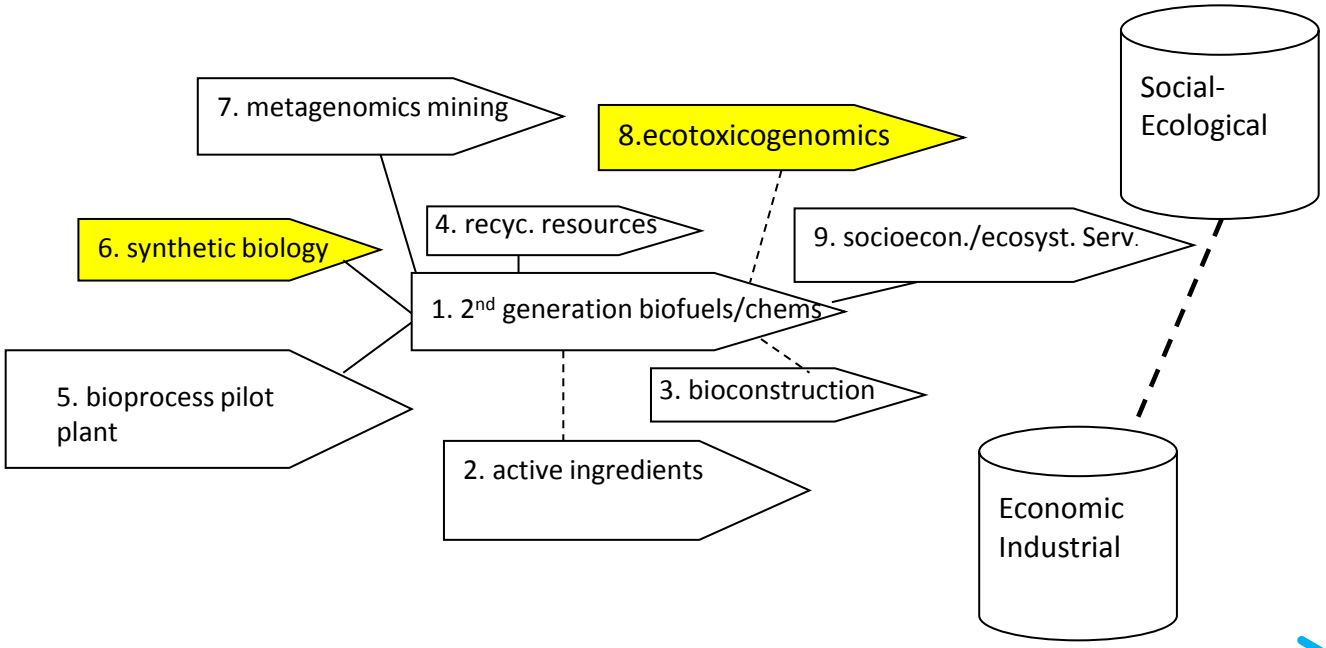
BE-BASIC, FLAGSHIP8

- Ecogenomics based processes (FS8)
- Monitoring tools for the bio-based economy



REFLECTION-ACTION PROCESS

Phase 1: Actor guided system analysis, BE-Basic actors

- Identifying and unraveling barriers
- Identifying relevant actors

35 interviews (FS8 members, other scientists, valorisation experts, regulatory agencies)

Phase 2: Deepening understanding, societal actors

- Exploration visions other relevant actors
- Barriers from their perspective

Phase 3: Action-oriented integration, BE-Basic and societal actors

- Constructing alternative implementation routes
- Science-society dialogue in effect

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FLAGSHIP 8, RESULTS HIGHLIGHTS

Cooperation:

- Interdisciplinary cooperation between FS members poses challenges (e.g. combining data, specific vs. generic toolbox, patents vs. scientific publication)
- Cooperation [illegible] on detecting pollutants in [illegible] voured by companies

Next step: Dialogue tools for internal alignment
(What do we strive for? What is our strength? What are internal and external challenges and how can these be addressed?)

FLAGSHIP 8, RESULTS HIGHLIGHTS

Policy Context:

- Novel biobased tools in the current system of chemical based rules and regulations
- Policy maker[illegible]ant toward these novel tools: p[illegible]
- Stakeholders[illegible]ensitive tools

Patents:

- Focus on pat[illegible]ot always favoured (expensive to file and to protect, while knowledge is in the open), more patents ≠ successful implementation

Next step: dialogue tools for interaction with relevant stakeholders
(e.g. policy makers, regulatory agencies, future users, etc.)

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