



Sustainable agriculture: balancing natural and social sciences

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Framing 'sustainable agriculture'

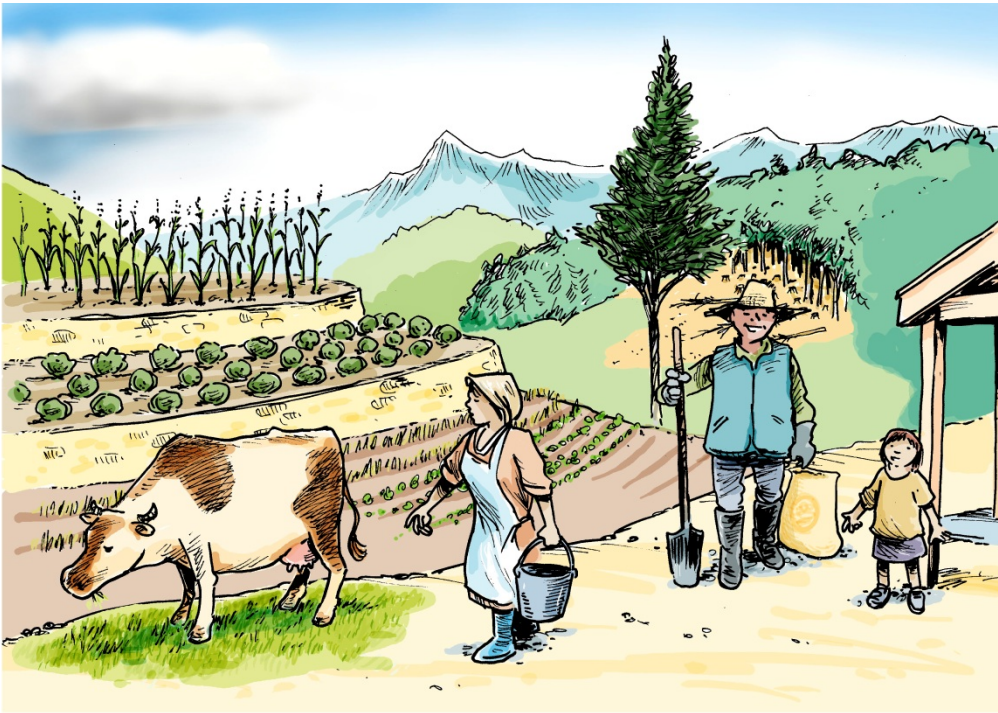


- **Focus on the bio-physical processes in agro-ecosystems**
 - Plant production, animal husbandry, technology development, ...
 - Social sciences reduced to economics: gross margins, cost of policies, ...
- **Focus on 'technological fix'**
 - Technological developments will solve the sustainability problems
 - More research on ever smaller-parts, e.g.: genes, nanotechnology
- **Goal is recommendations for farmers**
 - Focus on add-on innovations (new tool, new process, new input, ...)
 - Goal is not system redesign

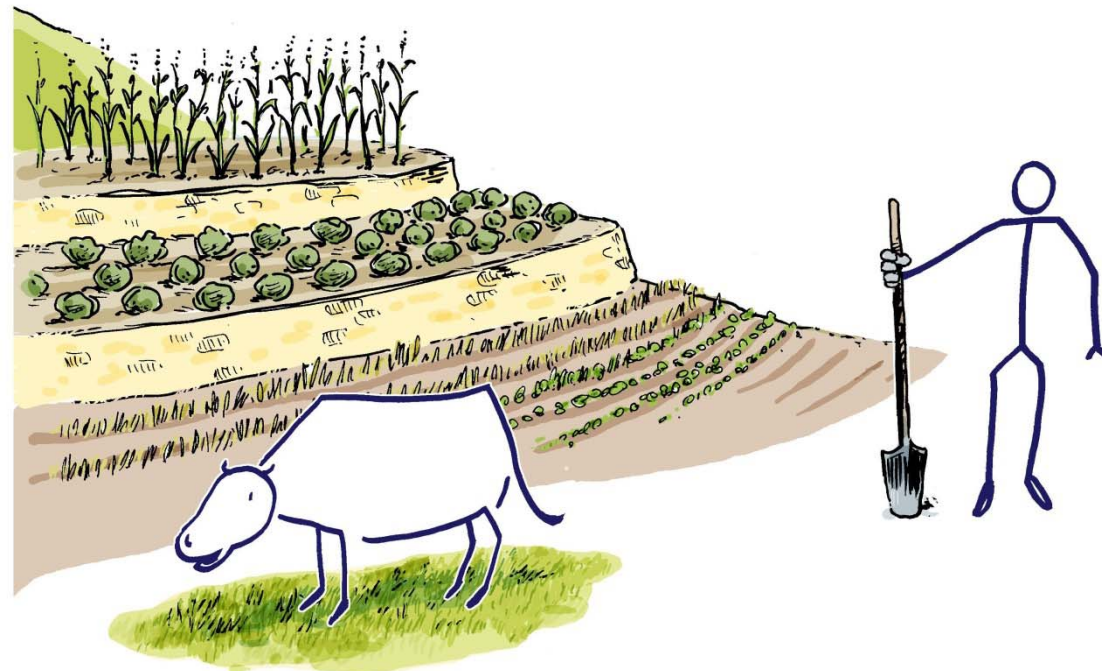
Researching sustainable agriculture



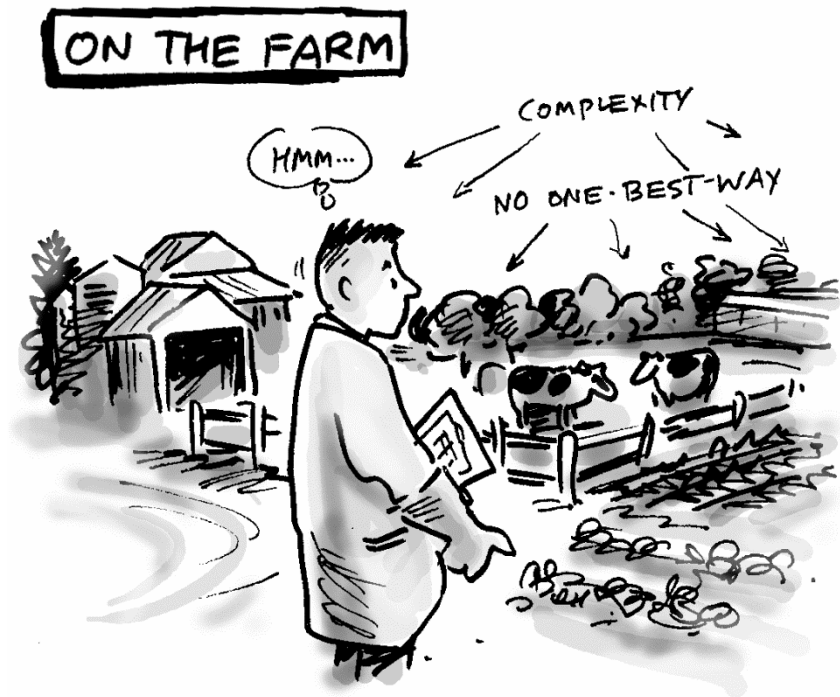
- **Business as usual**
 - No questioning of our epistemology, our institutional framework, our way of teaching...
- **Scientists identify a ‘solution’, then it is implemented by practitioners**
 - ‘Transfer of technology’ approach to extension
 - ‘Truth speaks to power’ approach to policy making
- **Scientists best qualified to identify solutions**
 - Simplifying assumptions in science unproblematic
 - Structural influences in science unproblematic (‘publish or perish’)
 - Disciplinary approaches deemed unproblematic



Disciplinary approaches can only capture small part of the complexity of real life...



Simplified models vs. complex reality

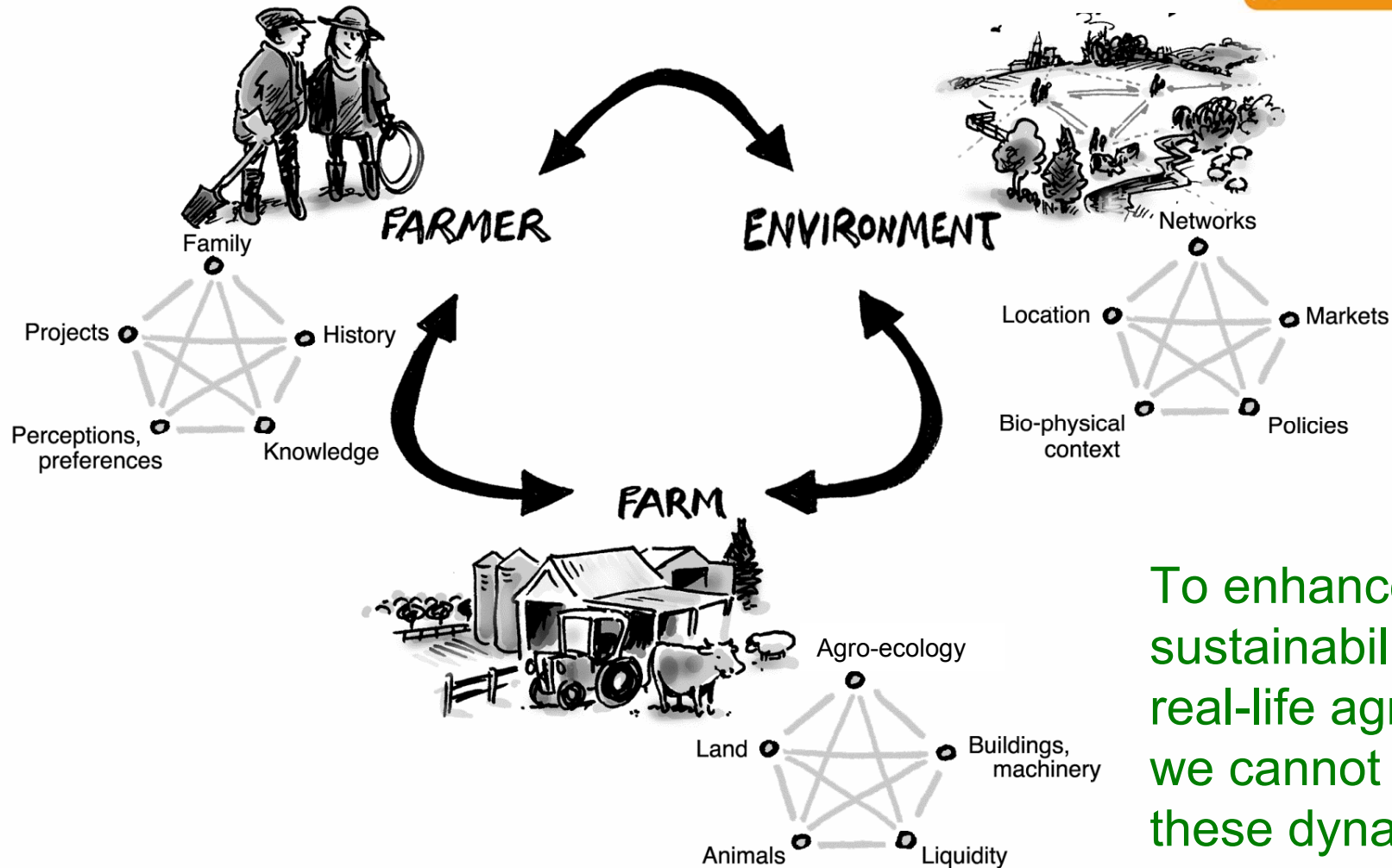


Transfer of technology approach



- **Simplistic assumptions of human decision making**
 - Technical rationality: farmers will do what is 'technically best'
 - Economic: farmers will do what is 'most profitable'
 - No role for: preferences, social dynamics (life cycle, family, village), perceptions, future expectations, ...
- **Nature of extension**
 - Delivery mechanism for the results of scientific research
 - Is not about facilitating change through social learning
- **Ignores dynamics of change**
 - Unpredictability, uncertainty, unknown (risk is rare)
 - Systemic effects on-farm, feedback loops, path dependency, ...

Real life is complex and dynamic



To enhance sustainability of real-life agriculture, we cannot ignore these dynamics!

Sustainability: ecological and social

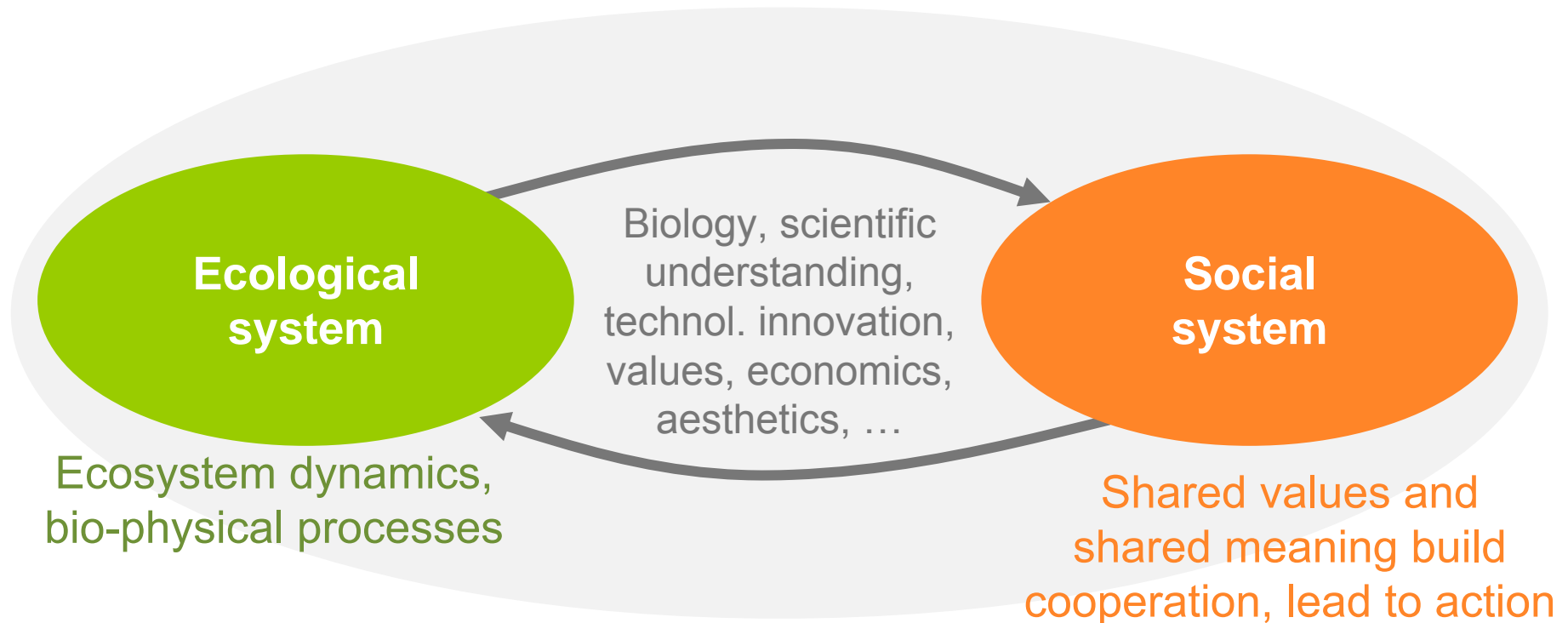


- Is the core problem that we do not understand nature or that we do not understand societal processes?
- Sustainability – an ecological perspective
 - Management of processes in agro-ecosystems, use of nat. resources
 - Accept limits: need to take into account planetary boundaries
- Sustainability – a social perspective
 - Outcome of collective decision-making that arises from interaction among stakeholders
 - Need to agree on trade-offs (e.g. ecology vs. economy; short-term vs. long-term cost/benefits)
 - Thus: first need to secure agreement on what the stakeholders take sustainability to mean in their environment!

Social-ecological system



Farming = structurally coupled ecological and social system.
Sustainability as emergent property of this coupling

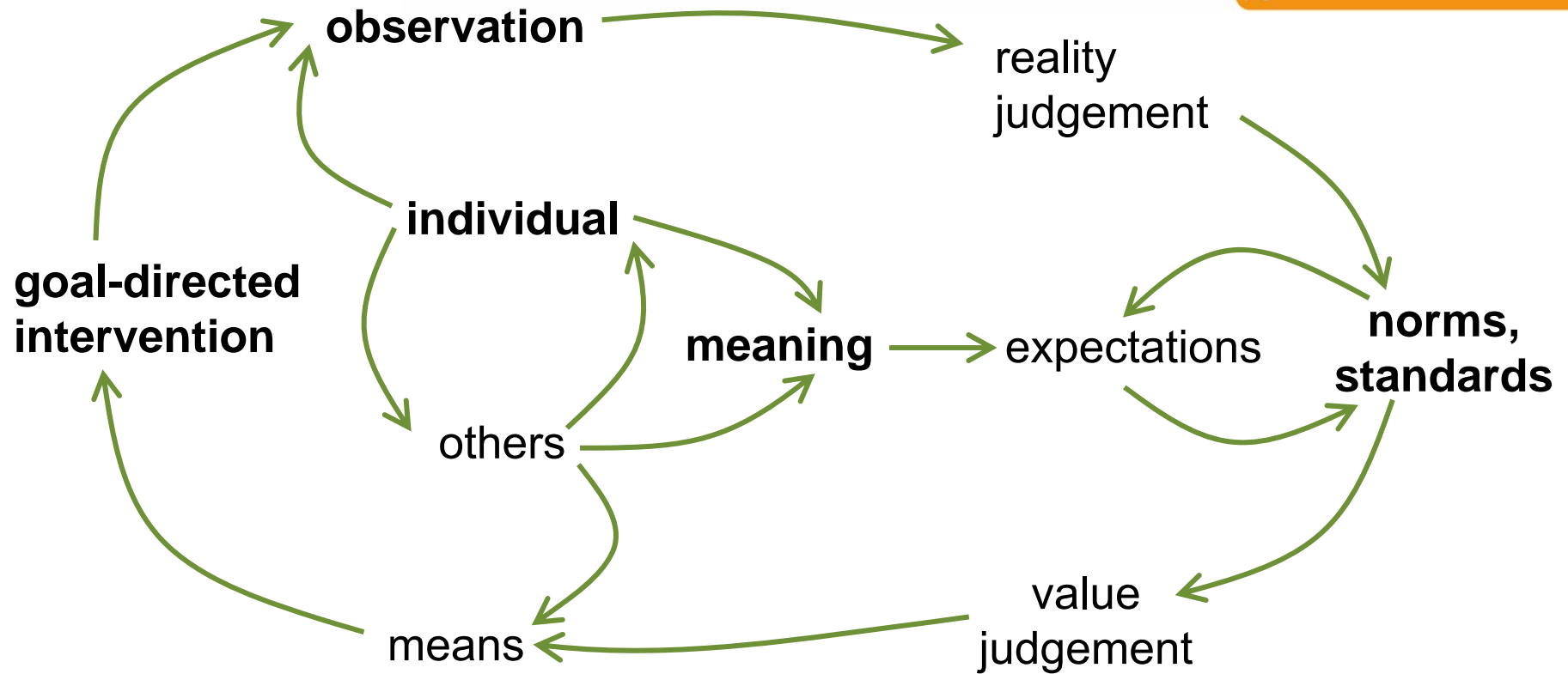


To understand sustainability...



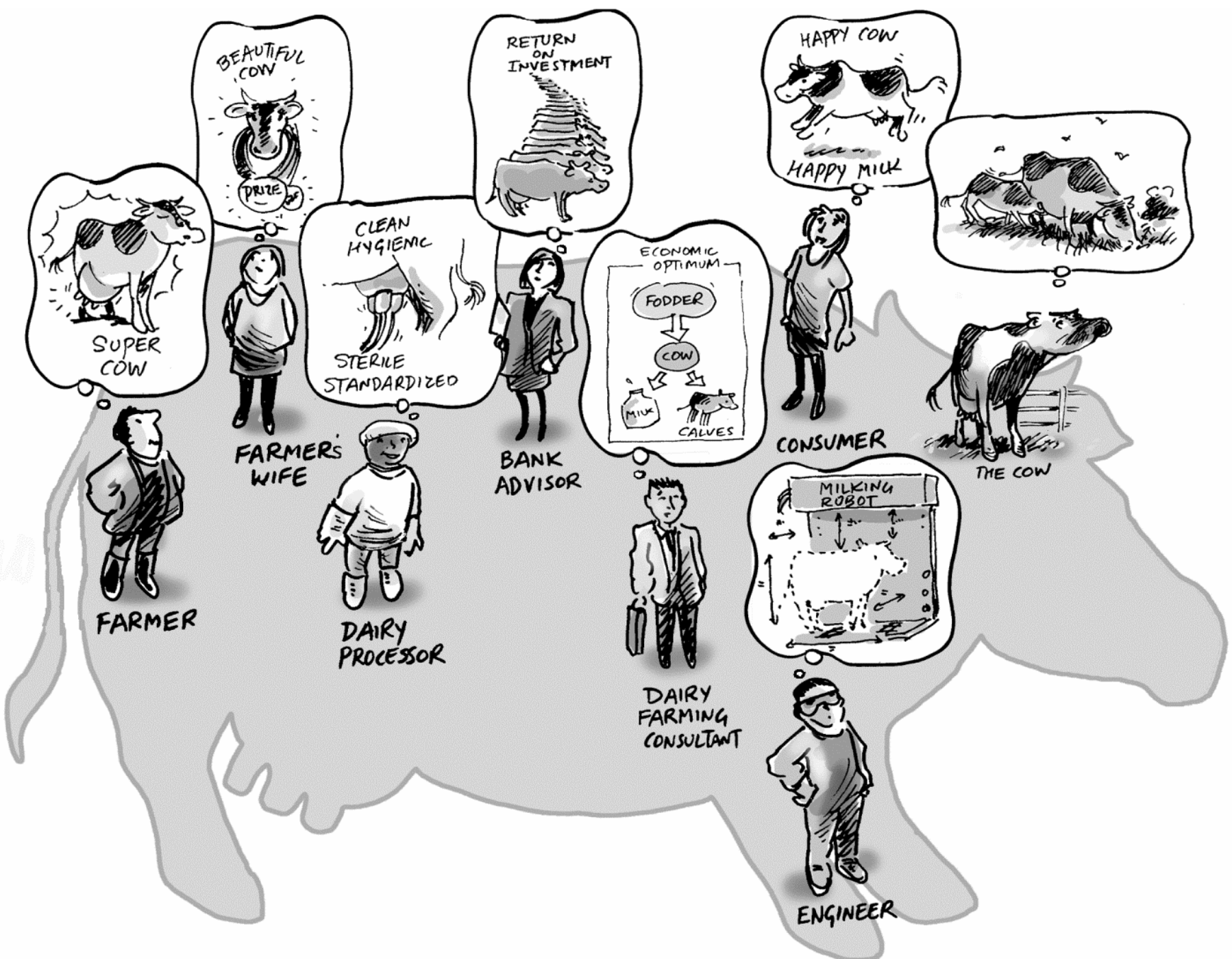
- **Pay attention how humans make sense of their worlds**
 - How do groups construct various realities? How do discourses change?
 - Which special interest groups exert power (e.g. to define which areas are crucial for further research)?
 - Why are certain framing so powerful (e.g. the economic 'imperative')?
- **From transfer of technology to designing social learning**
 - Co-construction of knowledge through engaging with stakeholders
 - Changes in understanding lead to changes in practice
 - Multi-stakeholder negotiation, developing consensus on actions to be taken: collective action and empowerment
 - Participatory process of social change

Social systems: perception and meaning



All this within the lifeworld flux of events and ideas...

Based on: G.C.B. van Wyk (1997) Appreciative systems; Vickers (1993)

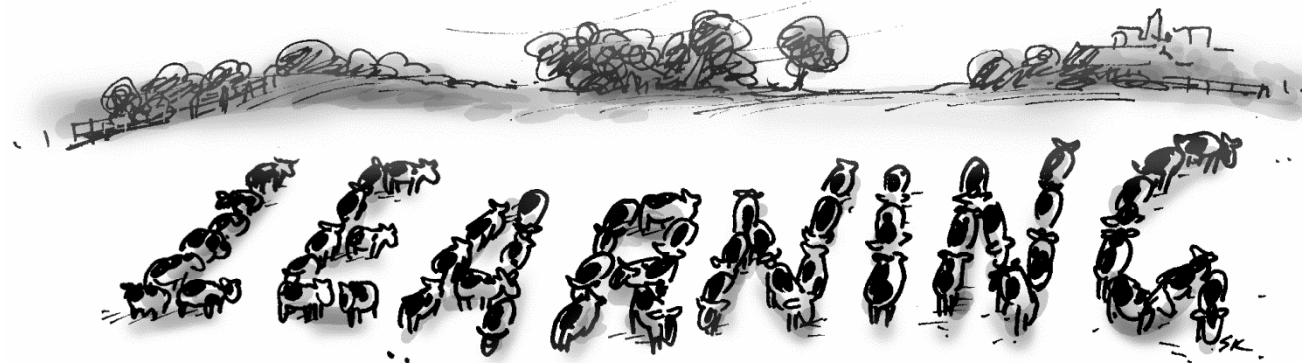


A bird needs two wings to fly...



- Sustainability needs both natural **and** social sciences!
- Sustainability needs the laboratory **and** engagement!
- Scientific knowledge **and** experiential knowledge!
 - Agriculture – agronomists (i.e. disciplinary scientists)
 - Farming – farmers (i.e. practitioners facing the complexity of real life)
- Currently there seems a bias towards natural sciences
 - Need to go beyond the rhetoric of 'sustainability'
 - Need to go beyond publishing (disciplinary) papers
- We need reflexivity in research
 - Doing things right vs. doing the right things





Societal impact of science



To achieve a real contribution to sustainable agriculture, we need fundamental changes in both research and teaching:

- **Promote interdisciplinary approaches**
 - Rather than multi-disciplinary add-ons
 - Need to integrate 'soft' social sciences into 'hard' natural sciences
- **Promote systems approaches**
 - Understand the links and interrelations between parts of a system
 - Understand the dynamics of a system (as driven by human perceptions)
- **Promote participatory approaches**
 - Integrate practitioners right from the start (project design)
 - Co-learning approaches, not better communication techniques

For a transition to sustainability,
we need to take people seriously!

