Different Understandings of Risk and the Discourse on Biotechnology

Jürgen Hampel

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An Overview

1. The scientific understanding of risk
2. Alternative Risk-Concepts
3. What lay people perceive as risks
4. Risik perception in the field of biotechnology
5. Why is the conflict on biotechnology framed as risk conflict?
6. Governance-Problems of modern biotechnology

Risk

- The term „risk“ has been implemented in the late Middle Ages. The use of the term „risk“ is the result of substantial changes:
  - From acts of god and spiritual forces to chance and calculation
  - Development of probability theory

Risk – a Definition

Risk: A situation or event in which something of human value (including humans themselves) has been put at stake and where the outcome is uncertain (Jaeger et al. 2001:17)

The Scientific Risk Concept

- $R = W \times S$
  - R (Risk)
  - W (Propabality, that a damage will occur)
  - S (Expectation of the Damage)
- Gives the opportunity to compare Risks.
- But needs consensus, how W and S should be defined.

- Example: Car Insurance

General Questions about Risk (foll. WBGU 1999, Jaeger et al. 2001)

1. What concept of possibility is used?
2. What types of outcomes and their consequences are considered?
3. What are the intended and what are the unintended consequences?
4. How are the concepts of possibility and outcome combined?
5. Who is the actor that judges the questions above?

Risk Characteristics (Renn)

- Complexity
  - Control of interaction effects?
- Insecurity
  - Non-deterministic links between cause and outcome (in some cases but not in others)
- Ambiguity
  - The possible consequences of a risk are evaluated in different ways by different social groups.

Constructivistic critics of the scientific risk concepts

- What is discussed as risks cannot be directly derived from nature but is the result of selection processes, which have a strong cultural and social dimension.
- Jasanoff (1990: 131): „Risk in this sense is culturally embedded and texture and meaning that vary from one social grouping to another. Trying to assess risk is therefore necessarily a social and political exercise, even when the methods employed are the seemingly technical routines of quantitative risk assessment“

Alternative Concepts of Risks

- Uncertainty about the damage, but also about the type of the damage.
- Risks do not refer to experiences of the past but to the future development.
- Sideeffects and longterm effects can only be determined in a limited way.
- No scientific method available to distinguish between „real“ risks and „Phantom“-Risks.

Risk dimensions of the WBGU

1. Probability, that a damage will occur
2. Extent of damage
3. Level of remaining insecurity
   - How sure are the assessments of probability and damage
4. Ubiquity
   - Geographic spread of potential damages
5. Persistence
6. Reversibility
7. Delayed Consequences
8. Potencial for societal mobilization

Risk Perception: Definition

- Different to risk assessment, risk perceptions means

- How social groups and individuals perceive risks (Renn al. 2007)

- The term perception comes from cognitive psychology and means:
  - All mental processes of an individual to process information from the environment (Jungermann & Slovic 1993)
  - Perception is a constructive process

Dimensions of Risk Perception

- Catastrophic Potential (grouped in time and space)
- Familiarity
- Understanding (is the mechanism understood)
- Uncertainty (is the risk scientifically known)
- Controllability (personal)
- Voluntariness of Exposure
- Effect Manifestation (Immediate or delayed Effects)
- Effects on Future (Risk to future generations?)
- Trust in Institutions
- Reversibility (are the effects reversible or irreversible)
- Origin (caused by humans or by acts of nature or god)

Risk Perception in the Public

Increased Concern

- Grouped in Time
- Unfamiliar
- Process not understood
- Risks unknown
- Uncontrollable
- Involuntary
- Delayed
- Future Generations
- Effects irreversible
- Caused by human actions or failures

Decreased Concern

- Scattered and Random
- Familiar
- Process understood
- Risks known
- Controllable
- Voluntary
- Immediate
- Reversible
- Caused by nature or acts of god

Risk Perception

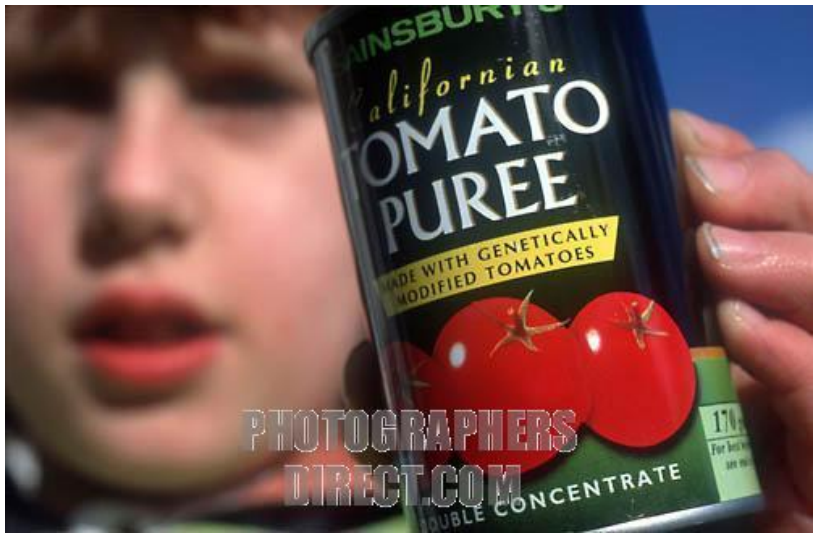
- While risk assessments attempts to decontextualise risks, risk percepts refers to the context in which a risk is expected.
- Perception of Risks and Benefits are not independent from each other.
  - For what purpose do you accept to take a risk?

The debate on agricultural Biotechnology

- Although the debate goes back to the 1980s (and perhaps even back to Asimilor), the year 1996 was a decisive year..

„The years of controversy“

- In 1995, genetically modified tomato puree has been sold in the UK.
- Although there was no legal requirement, the producers labelled the product as genetically modified (yellow label).
- No critical reactions in the British public.



At the same time: BSE-Crisis

- British authorities excluded any risk, that BSE would be risky for humans.
- In spring 1997, the first article was published in NATURE demonstrating that also humans can get BSE.
- Consequence:
  - Erosion of the trust into the British regulatory system
  - New institutions had been established.

1996 – ships passing in the night

- 1995 gm soy beans developed by Monsanto had been approved in the European Union.
- At that time, there was a broad coalition between science, policy and business to go into agricultural biotechnology (Jasanoff: to make biotechnology happen).
- First import of roundup-ready Soy Beans in November 1996 without labelling
- Mobilization of the European Public

Risk-Perception of Agricultural Biotechnology

- Genetically modified food is not an issue of central importance for the European Public.
- Benefits is only abstract (good for the economy ca. 33%), not on the individual level
- Risk perception refers to the lack of long term experience (Guinea Pig)
  - GM-food will be safe for future generations: 16% agree, only 3% agree definitely,
  - About 45% of Germans don‘t think at all that genetically modified food is safe.
- The distribution of benefits and risks is perceived to be problematic (75%):
- Emotional resistance (makes me feel uneasy, in D 78%, EU 70%)

Variations

- Acceptance differs substantially according to different suggested benefits, highest for less pestizides in food stuff and environmental friendly production.
- Differentiation between cisgenics and transgenics
  - Acceptance of cisgenics is substantially higher than acceptance for transgenic apples.

Bottleneck

Retailers

Problem

- The acceptance criteria for consumer products is the willingness to buy them

Why is the Biotechnology debate a risk debate?

- The debate on agricultural biotechnology developed in the 1980 as broad debate on issues like the future path of the agricultural production (industrialised agriculture on the one side, regional and organic on the other side).
- Different to medical biotechnology, the regulatory debate was restricted to risk arguments.

What does this mean for communication?

What is Communication?

- Communication is a process, where the recipient is activly reconstructing a message from the sender.
- We can conclude only from the reaction, whether this reconstruction is identical with the ideas of the sender.

Successful communication requires:

- A common set of signs and symbols
- Common moral understandings, experiences and values
- Or: Knowledge about these factors