Towards Sustainable and Risk-Informed Land Management in Europe

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CULTURE NATURE
How we started and developed up to now

- early 80ies: public scandals
  - zero risk tolerance (no uncertainties)
  - multifunctional use: sites, soil & groundwater
- Can we afford it? How clean is clean?
  - land-use related soil/environmental quality
- What do we need to achieve? When?
  - Risk-Based Land Management
- How do we achieve our goals?
  - sustainability
  - environmental friendly practices
Discussing needs
Old and new challenges ask for innovative thinking

... managing contaminated land ...

- **geographical scales** – site, region, river basin, globe?
- **time scales** – urgent (now!), mid- or long-term?
- **environmental friendly or/and sustainable**?
- **stakeholder involvement** – whom, how, when?

- **wider management frames and constraints**
  - **Financing** (polluter-pays-principle, land markets, role of privatization, p-p-p-partnership and vs. state aid)
  - **Long-term Liability** (If and how to share it?)
Learning by identifying deficits


- **Cluster A: 10 deficits related to assessing and understanding risks**
  - Do we share a common understanding?

- **Cluster B: 10 deficits relating to managing risks**

**DO WE NEED TO LEARN TO ...**
- improve our actions?
- clarify new frames?
- transform structures?

"TRIPLE-LOOP-LEARNING"
Understanding “risk” as a concept?

◆ Use by different disciplines
  - e.g. toxicology, engineering, social sciences …

◆ How it relates with …
  - uncertainty, “hazard” and “safety”

◆ risk acceptance / tolerability
  - e.g. traffic-light-model (IRGC, 2005)

◆ Common elements:
  - SOMETHING WE VALUE
  - a negative consequence (harm, loss or damage)
  - the probability of occurrence,
  - an alogarithm to aggregate & contingency (choices!)
Introducing the IRGC’s Risk Governance Framework

- Getting a broad picture of the risk
- Risk assessment PLUS concern assessment
- Is the risk tolerable, acceptable or unacceptable?
- Is the risk simple, complex, uncertain or ambiguous?

Pre-Assessment

Characterisation

Communication

Appraisal

Management
Understanding “sustainability” as a concept?
Wide variety of perspectives

**Germany** (roots back to 15th century and forestry)
... describes the use of a regenerating system in such a manner, that this system conserves its fundamental capacities and its stocks may be regenerating naturally.

**U.S. America** (E.O. 13514; 2009)
“... to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations.”
## Risk and Sustainability
### What’s common? What’s different?

<table>
<thead>
<tr>
<th>Risk</th>
<th>Sustainability</th>
</tr>
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<tbody>
<tr>
<td>origin / use</td>
<td>economy / science</td>
</tr>
<tr>
<td>based on ...</td>
<td>a mental construct</td>
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<tr>
<td>objective</td>
<td>transparency</td>
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<tr>
<td>Important</td>
<td>• single target</td>
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<td></td>
<td>• accountability</td>
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<td></td>
<td>• effectiveness</td>
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<tr>
<td>question</td>
<td>Should we act?</td>
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<tr>
<td>support to ...</td>
<td>better decisions</td>
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<tr>
<td>strategy</td>
<td>prevent or limit</td>
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</tbody>
</table>
Risk and Sustainability
How to make it complementary?

Clarifying …
◆ objectives (values)
◆ system and system boundaries
◆ principles
◆ milestones along the land management process
  ▪ understanding risk prepares a judgement
  ▪ sustainability prepares management actions
  ▪ risk & sustainability control implementation

WATCH OUT:
◆ Not trading risks against sustainability!
What we need to enhance …

GOOD “GOVERNANCE”
- Deals with identification, assessment, management and communication in a broad context
- Includes all actors, rules, processes and mechanisms
- **principles are:** transparency, effectiveness and efficiency, accountability, strategic focus, equity and fairness, respect for the rule of law, political and legal feasibility, ethical and public acceptability

MANAGING “LAND” (resources, soil & groundwater)
- Matching human needs to natural capacities
- Crossing geographical and time scales (site to globe and back; short-, mid- and long-term)
- Promoting synergies, avoiding irreversibility
Understanding our frames …
… to prepare better decisions (2nd loop)

CONCEPTUAL FRAMEWORK
- Risk-Based Land Management
- Sustainability: SuRF UK & NICOLE
  - Governance: Risk and Sustainability

ANALYTICAL TOOLS (aiming to simulate different choices)
- simple indicators (e.g. carbon footprint, specific energy use)
- complex environmental accounting/balance
- matching economic and ecological balances & organising stakeholder discourse

METRICS (aiming to condense simplified information)
- organising complex information to provide the complete picture, e.g. *Environmental footprint*
- use simple things creating impacts, e.g. *Carbon footprint*
Improving our actions ... 
... to enhance efficiency (1st loop)

✓ Greening Remediation
  ✓ minimizing the environmental footprint
  ✓ adapting and contributing to CO₂- and energy-saving

✓ Practicing Synergies
  ✓ risk management-recycling-renewables
  ✓ organised at regional scales
  ✓ optimizing engineered solutions & “working with nature”

✓ Sustainable/Green Technologies
  ✓ not a single technology but a fan/variety of technologies
  ✓ identify typical routine applications (small, wide-spread sites)

**WATCH OUT**: time frames often drive cost & ecology!
Need for a Triple-Loop?
Transforming towards better Governance …

**RISK-INFORMED** (transparent and accountable)
- natural capacities and ecosystem services (soil/sediments-waters-atmosphere – from local to global - sites & planet) and
- societal system and processes (human well-being)

**SUSTAINABLE** (fair, environmental friendly and participatory)
- corporate responsibility from local to global ("bottom-up")
- social learning (triple-loop-learning: improve, reframe, transform)
- structured strategies to act on complexity, uncertainty, ambiguities
- options & scenario-thinking (anticipating different futures)
- from BAT to NEXT (‘next’ environmental technologies – “factor 4”)

→ enabling society to benefit from remediation while minimizing negative consequences
As the dominant characteristic changes, so also will the type of stakeholder involvement need to change.
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THANKS FOR LISTENING

Questions are welcome!

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