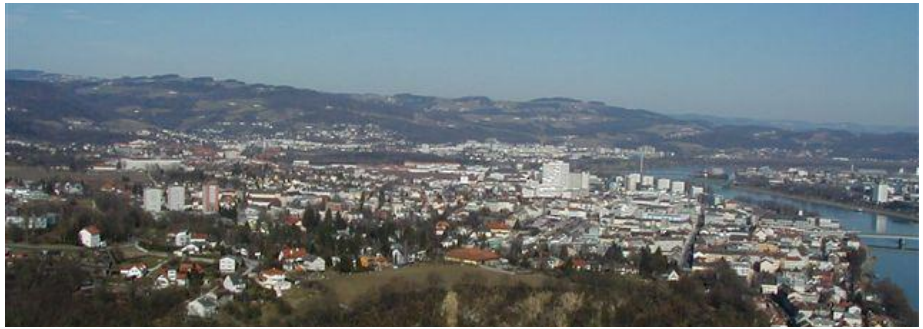

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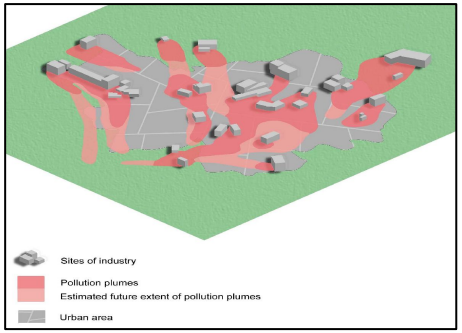

© Environment Agency Austria

“ONE HEALTH” vs. “FOREVER CHEMICALS”

PFAS, A CALL TO RETHINK HOW WE MANAGE CONTAMINATED LAND

14th International HCH and Pesticided Forum (online, 23.02.2023)

Dietmar MÜLLER-GRABHERR

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ENVIRONMENT AGENCY AUSTRIA

COMMON FORUM - WHAT ABOUT?

CONSTITUENCY:

- initiated in 1994 (Bonn; Germany)
- policy makers, regulators & technical advisors
- European (EU + Free Trade Association)
- regular Secretariat (established in 2007)
  - Environment Agency Austria (EAA; since 2017)

Source: © https://commons.wikimedia.org/wiki/File:European_Economic_Area_members.svg

MISSION:

- **exchange of knowledge and experience**
- **discussion platform on policy, research and concepts**
- **cooperation to stakeholder**

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OUTLINE

… some epilogue: PFAS, when did the story start?

- **typical environmental legacies**
- **What‘s the status quo?**

  (Did we already cross tipping points?)
- **Contaminated Land: Future Needs!**

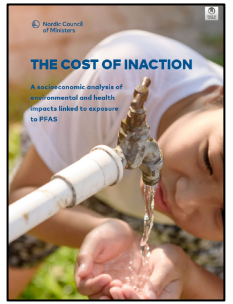
PFAS: WHEN DID THE STORY START?

- **PTFE: 1938**
  - *electrochemical fluorination (ECF): 1941*
  - John F. Kennedy: 12 September 1962
  - Neil Armstrong: 21 July 1969
- **Toxicology : 2008 – 2020**
  - *from single to multi-compound assessment*
  - *exponential decrease of TDI's (like: 11.550 / 19 / 8 / 4.4 in 12 years)*

TYPICAL ENVIRONMENTAL LEGACIES

- **ITALY:** Veneto region – according to WHO: groundwater contamination impacting drinking water of > 350 000 residents
- **NETHERLANDS & BELGIUM:** Dordrecht & Zwijndrecht (Antwerp): soils in a distance up to 50 km significantly contaminated by PFAS (atmospheric deposition)
  - 2019 (NL) & 2021 (BE): the general public reacts ("PFAS-crisis")
    - OVAM (Flemish Waste Agency; 2020): Hinter soil: 1,0 bis 1,5 µg/kg TM
- **GERMANY:** Rastatt (application of sludges in agriculture) und Arnsberg (county Altötting)
  - PFAS contamination of larger areas impacting agricultural products, groundwater and drinking water wells
  - Levels in blood of residents significantly above relevant toxicological criteria (HBM-II-values)
  - **Report UBA-DE (2020; Link:** "Managing local und landscape PFAS-contamination")
- **SCANDINAVIA:** aiports (and further point sources), particular quallenge in estuaries like e.g Norway, for sediments and biota in fjords
  - Council of Environment Ministers: **"The cost of inaction" (2019; Link)**
    - **Europa 10 – 20 Mrd. €** ("best estimate")

© German Federal Environment Agency (2020)



© Nordic Council of Ministers (2019)

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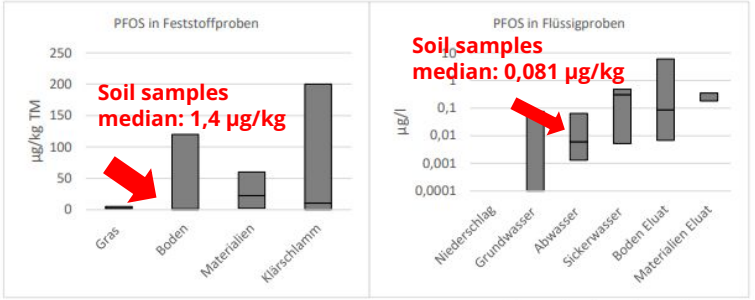
REGIONAL PFAS BACKGROUND LEVELS EXAMPLE SOIL (AUSTRIA)

- national level studies: POPMON (*), AustroPOP (Böden) (**)
- regional study Vorarlberg 2021 (***):
  - 110 environmental samples
  - up to 26 PFAS, AOF/TOP/non-target-analytics

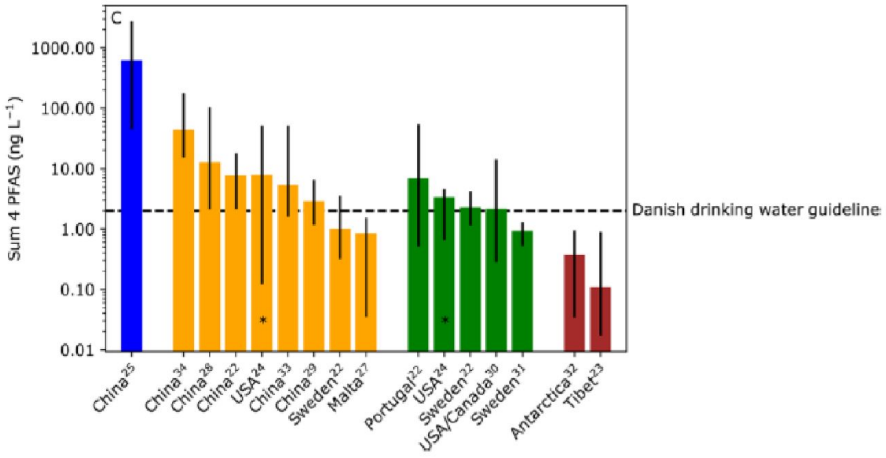


© Humer & Scheffknecht (2021)

- PFAS detected in all environmental media
- soils have a crucial intermediate role as temporary (!) contaminant sinks
- important pathways: Abwasser und wastes (e.g. sewage sludge)
- atmospheric deposition causing ubiquitous background levels

(*) https://www.ages.at/wissen-aktuell/publikationen/popmon/
(**) https://www.bodeninfo.net/projekte/austropops/
(***) https://vorarlberg.at/-/per-und-polyfluorierte-alkylsubstanzen-pfas-in-vorarlbergs-umwelt

GLOBAL PFAS BACKGROUND LEVELS EXAMPLE RAINWATER



© Ian T. Cousins et al. ES&T 2022

HEALTH ADVISORY LEVELS:

Drinking water standards:

- ***EU: 100 ng/l (20 PFAS)***
- ***DK (2021): 2 ng/l (4 EFSA PFAS)***

Ian T. Cousins et al. (ES&T 2022):

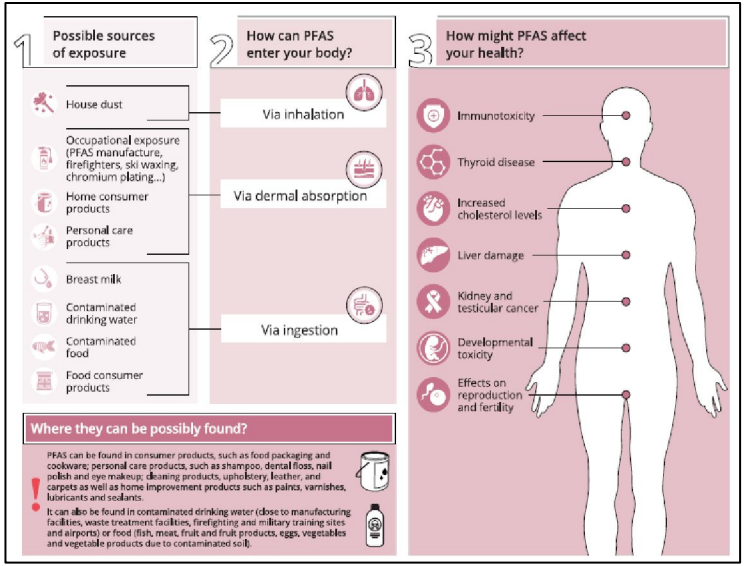
„It is, therefore, concluded that the global spread of these four PFAS in the atmosphere has led to the planetary boundary for chemical pollution being exceeded."

EU HUMAN BIOMONITORING INITIATIVE

HBM4EU

(2017 – 2022; funded EU Horizon 2020 RTD-programme)

- established baselines for the internal exposure to 12 PFASs for European teenagers in 9 countries
- evidencing that 14,3 % exceed the guideline value for a tolerable weekly intake,
- with a country-specific maximum exceedance found at 23,8 %
  - higher PFAS blood levels were found linked to the consumption of fish, seafood, eggs, offal and locally produced food (Richterová et al., 2023).



© HBM4EU, European Human Biomonitoring Initiative (June 2022): Policy Brief PFAS (to access and download click HERE)

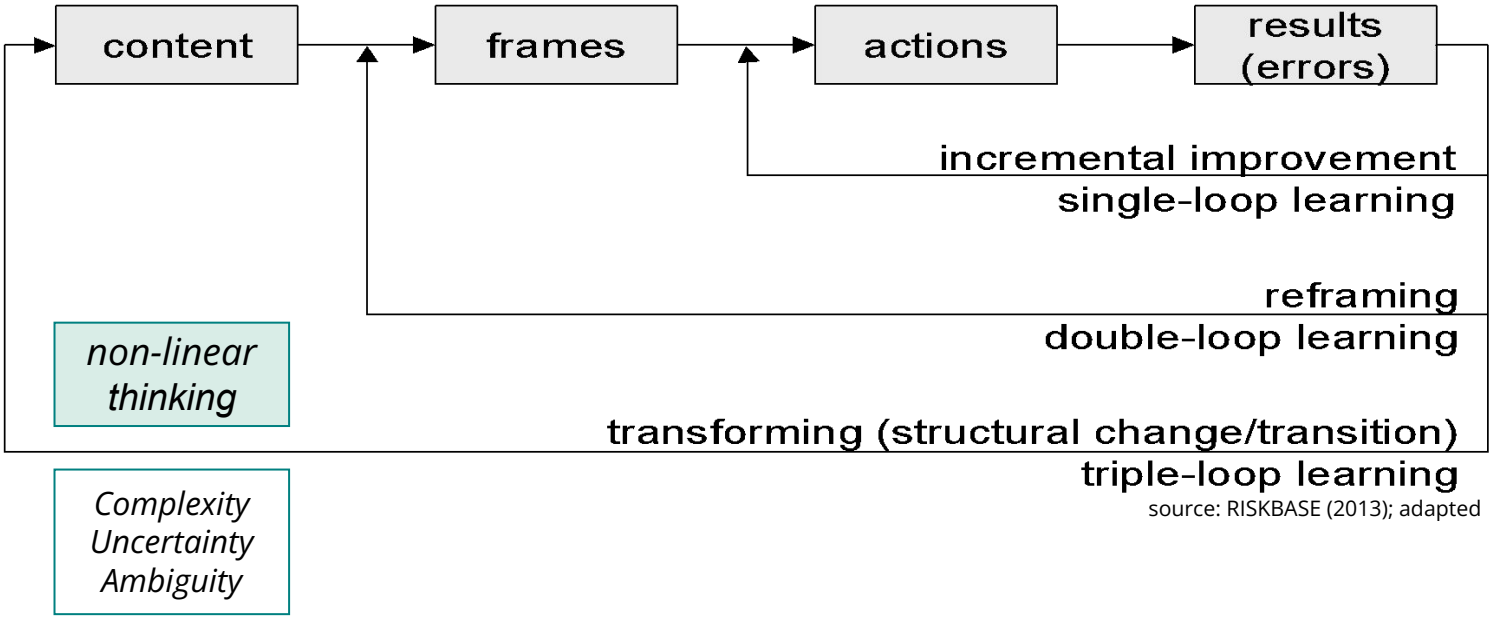
STATE – PFAS IN THE ENVIRONMENT

- evidence since ~ 2006 (Contaminants of Emerging Concern?)
- point source inputs & diffuse inputs to soil and water
- background values may exceed EQS regionally
- data & information are heterogeneous & incomplete across Europe
- sequentially decrease in tox-data over time (see EFSA 2020)

→ **ubiquituous & hard-to-treat contamination, irreversibility?**

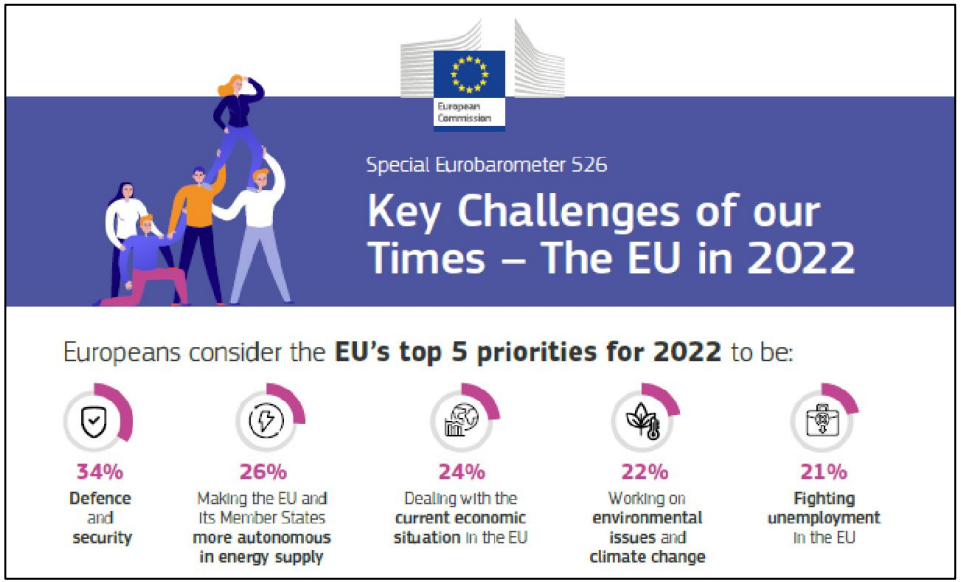
→ **needs to manage PFAS contamination are getting pressing!**

"TRIPLE-LOOP-LEARNING"

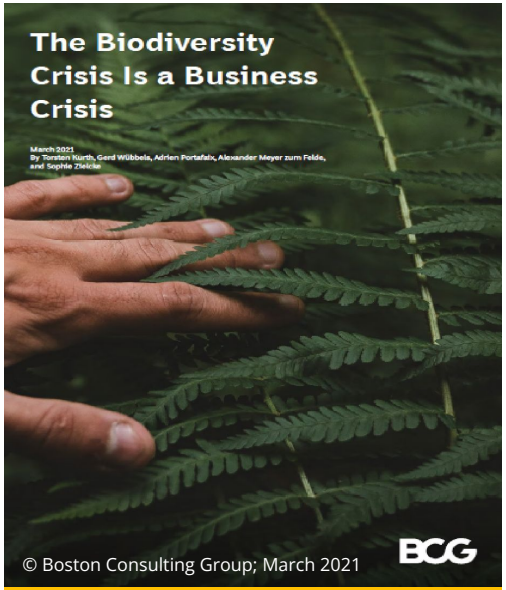


source: RISKBASE (2013); adapted

Societal Challenges …
Do we share insights or a „Sense-of-Urgency“?



© EC 2022; Eurobarometer, May 2022



“biodiversity loss is reducing GDP annually by $ 5 trillion“

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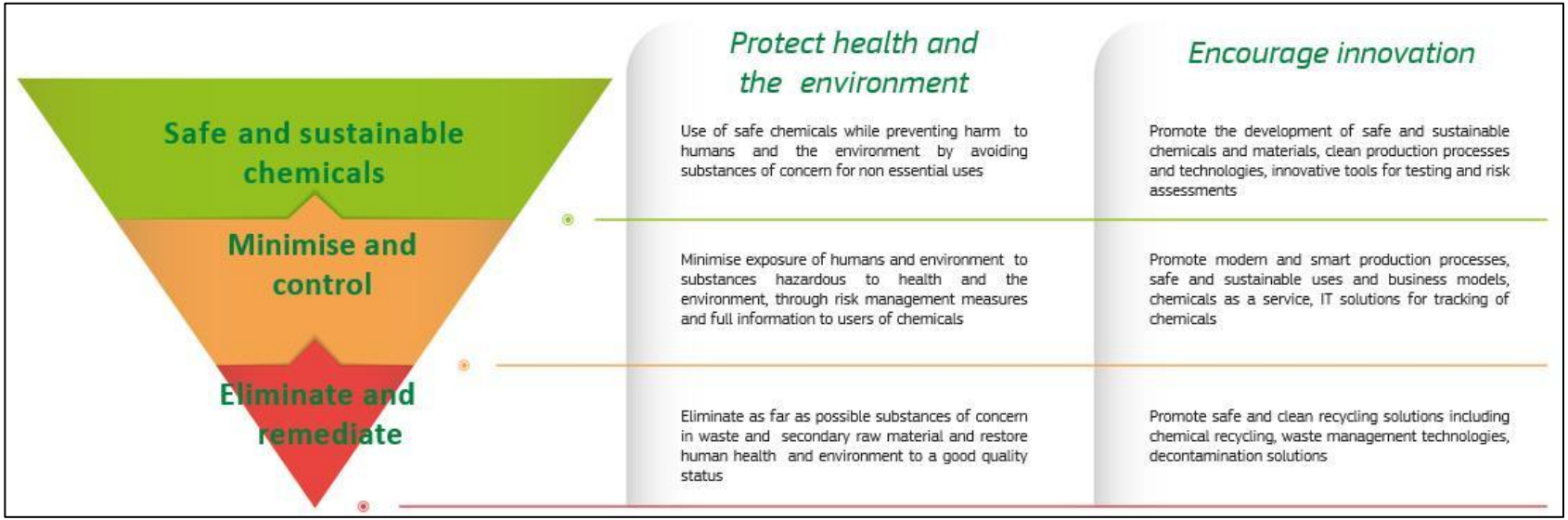
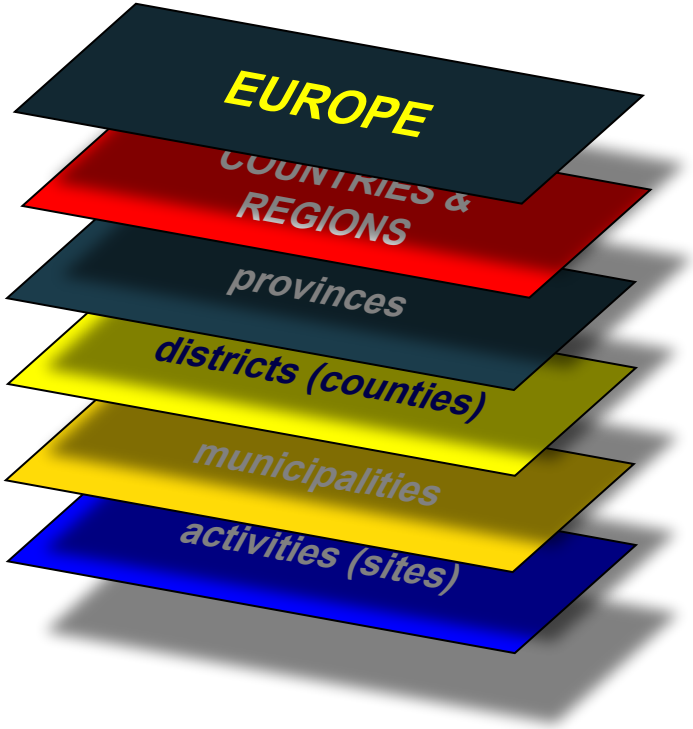
ZERO POLLUTION ACTION PLAN (2021)
The pyramid of action



Reversing the pyramid of action, prioritising the approaches for tackling pollution

CALLING UPON EUROPE TO JOIN FORCES



Key requirements

a. Establishing **high standard risk assessment** based on the state-of-science

b. Validating risk-based modelling by biomonitoring studies

c. Coordinating **transnational development of remediation methods** and integrated management approaches

d. Alternatives to active technical rehabilitation measures, must be developed and integrated into policy frames and legislation

e. A harmonisation of European & national regula-tory approaches for soil, waste and groundwater

CONTAMINANTS OF EMERGING CONCERN
GENERAL REFLECTIONS

- **Risk Management Challenges:** Uncertainty, complexity & ambiguity
- **Knowledge-based societies:** Quick transfer / communication of research findings to embed to practice administrative implementation?
- **Cross-sectoral and multi-stakeholder: Transparency** and improving for a good **common understanding & language**

TOWARDS "ONE HEALTH"

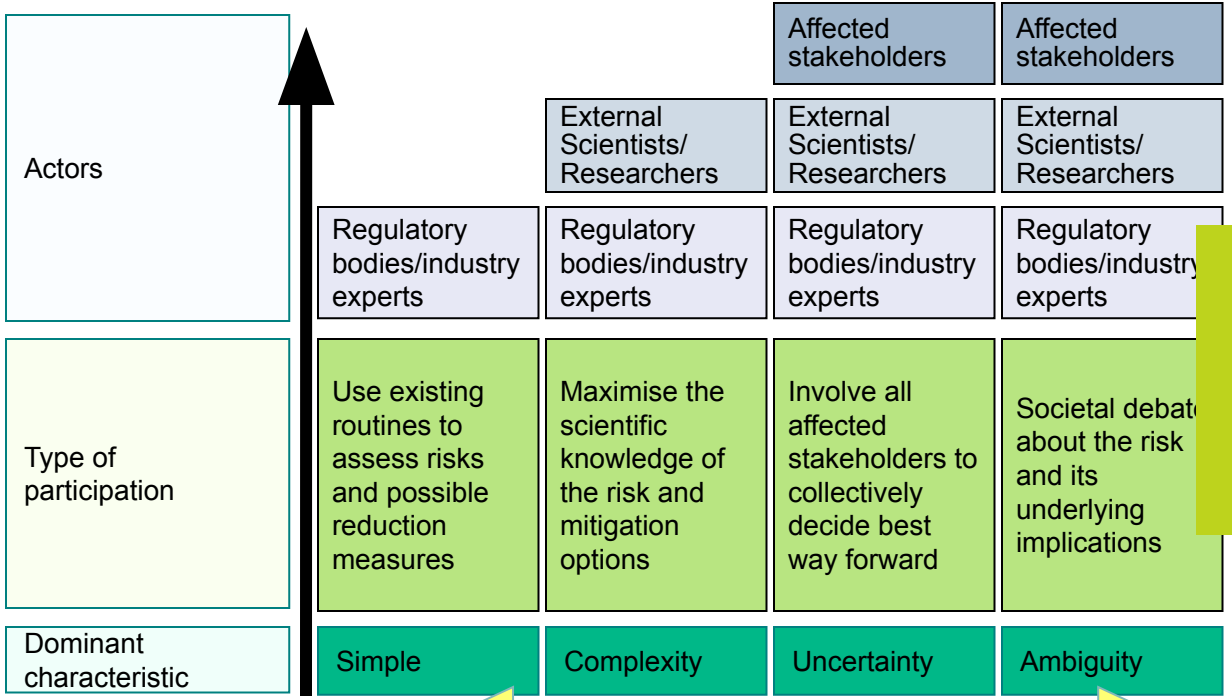
- **Integrated and adaptive policies**(toxic-free-environment)
- **Sound institutional arrangements and resources!**

CHALLENGE or CRISIS?

- **The question that matters: WHO TAKES LEADERSHIP?**

IMPROVING PARTICIPATORY PROCESSES

STAKEHOLDER INVOLVEMENT (IRGC, 2005)



IT NEEDS ALL SOCIETAL ACTORS!

As the dominant characteristic changes, so also will the type of stakeholder involvement need to change

(Introducing the IRGC's Risk Governance Framework

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"To our fellow species and our collective future"

(The Sixth Extinction; by Richard Leakey and Roger Lewin; 1995)

Por el suelo (Manu Chao)

https://www.youtube.com/watch?v=tdNm4N14wT4

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Biodiversity, Circular Economy & Climate Change – streamlining Societal Challenges to Contaminated Land

14th , 6.09.2022

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VISIONING: CLM for 2030

CONTACT & INFORMATION

"HEALTHY SITES & SOILS": Circular reuse of land & soil is a routine in urban & spatial planning

Changed image – creating better visibility and encouragement demonstrated by projects (*see Living Labs & Lighthouses*)

Risks are made transparent, comprehensible & calculable

Projects are safe, ecological effective and economical viable

- *accurate information/data*
- *intensive communication*

Opportunities are taken

certainty of justice and planning

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