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- MOSAIC project (Sustainable Land Use – Climate change mitigation and adaptation, biodiversity and renewable energy)

MOSAIC

with a.o.

UNIVERSITY OF COPENHAGEN

KLIMASKOV FONDEN

https://www.linkedin.com/company/mosaiclanduse/

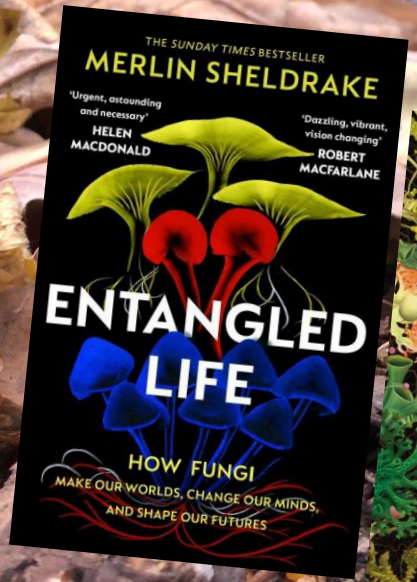
  - Coordination + Transformative Change + Transdisciplinary Research for Actionable Knowledge

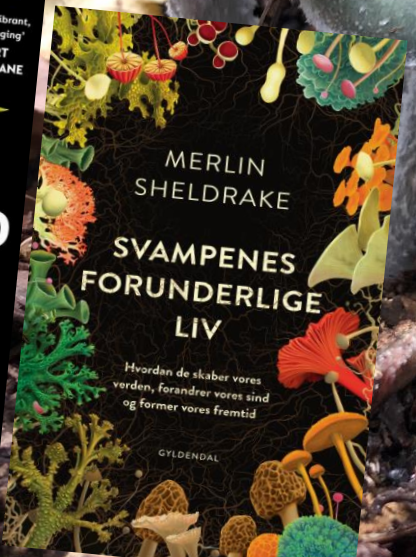
- SELINA project (Natural Capital, Ecosystem Services and decision making)

SELINA

  - Transformative Change & Seeds of Change in Ecosystem ~~Services~~ **Favours** + Communities of Practice

Nature-based solutions





SELINA
SCIENCE FOR EVIDENCE-BASED AND SUSTAINABLE DECISIONS ABOUT NATURAL CAPITAL

Transformative Change & Ecosystem Services

Dieter Cuypers
VITO

23/09/2024

vito

Funded by the European Union

What is Transformative Change? (transformative/transformational)

"a fundamental**, system-wide** reorganization across technological, economic and social factors, including **paradigms**, **goals** and **values**" (IPBES, 2019).

Is about:

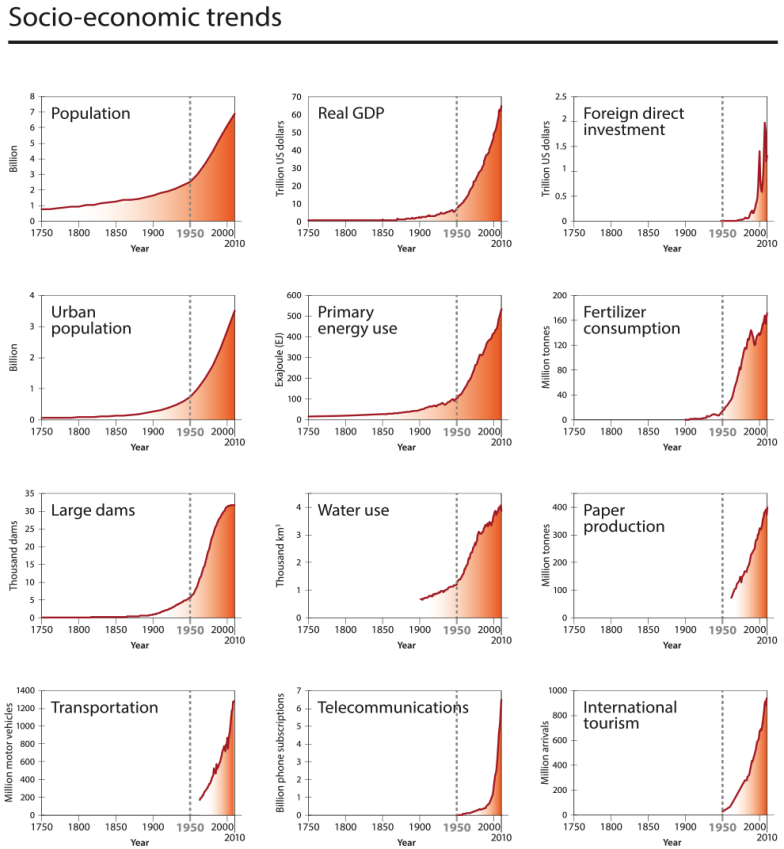
- Systems (relationships)
- Radical change
- Fundamental transformation
- Root causes & Indirect drivers
- Paradigm shifts, new narratives
- …

It is not about:

- Optimisation
- Iteration, Incremental change
- Efficiency
- Current practice or Business as usual, building on existing mechanisms
- Siloing
- …

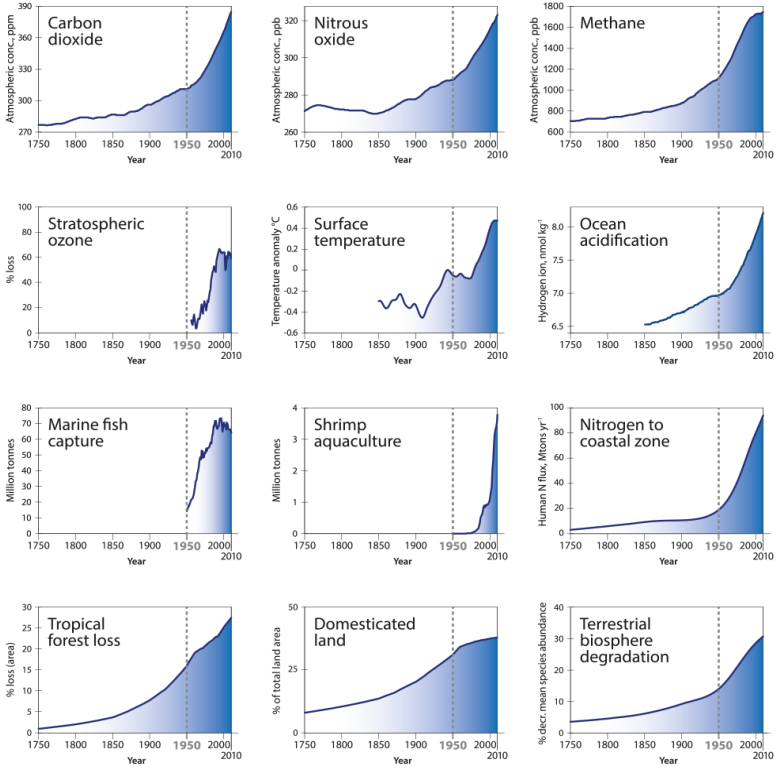
Why do we need Transformative Change? (1)

"**Goals for conserving and sustainably using nature and achieving sustainability cannot be met by current trajectories**, and goals for 2030 and beyond may only be achieved through transformative changes across economic, social, political and technological factors" (IPBES, 2019)



Why do we need Transformative Change? (2)

Earth system trends



One constant

How credible or feasible is or even

and which knowledge enables us to expect this?

Paradigm shift, a fundamental change in approach or underlying assumptions.

Normal Science
Puzzle solving stage
Scientists share common paradigm
-make measurements
-articulate theory
-make predictions

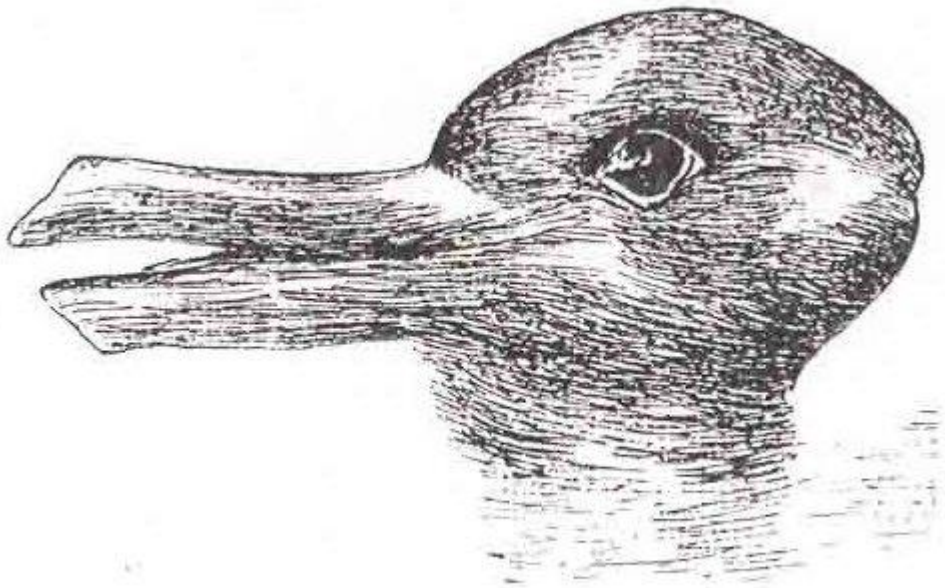
Anomaly
Blame apparatus
Set aside problem
Modify paradigm

Crisis
Anomaly too problematic
Faith in paradigm shaken

Change in World View
Gestalt shift
Problem seen from different perspective
New paradigms explored

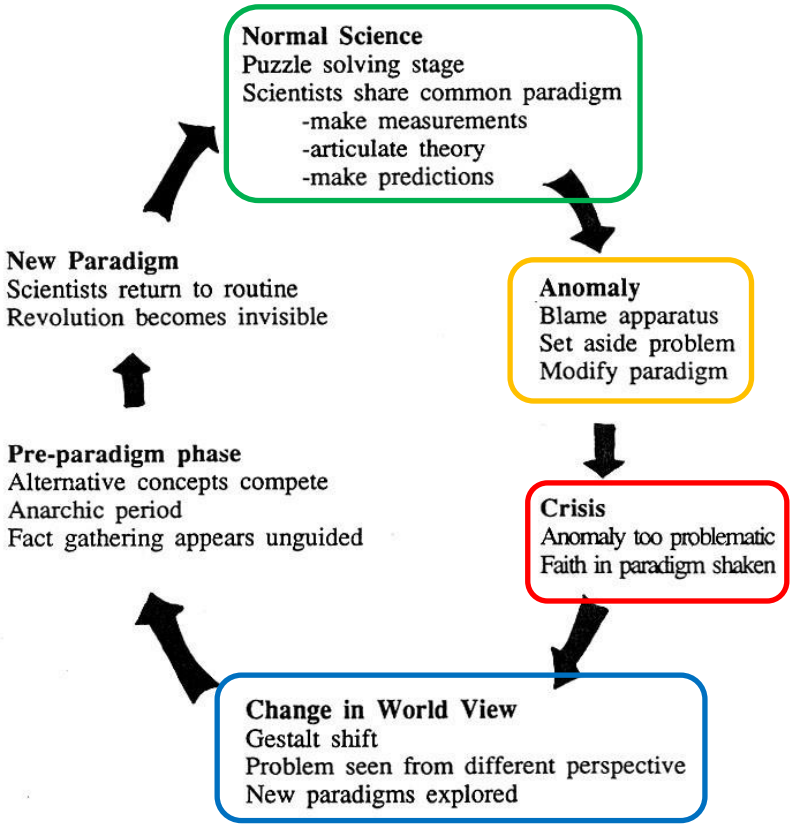
Pre-paradigm phase
Alternative concepts compete
Anarchic period
Fact gathering appears unguided

New Paradigm
Scientists return to routine
Revolution becomes invisible



Thomas S. Kuhn (1962)

Paradigm shift (2)



Policy: **environmental legislation aimed at fighting pollution knowledge paradigm**: environmental monitoring, data, indicators, assessments linked to implementation, scientific research

Policy : modification to **efficiency thinking Knowledge paradigm**: effectiveness, efficiency, market-based instruments, BAT studies, voluntary instruments

Europe will not achieve its 2030 goals without urgent action during the next 10 years to address the alarming rate of biodiversity loss, increasing impacts of climate change and the overconsumption of natural resources.

The European Environment Agency's (EEA) latest *(2019, but 2015 as well)* 'State of the Environment' report states that Europe faces environmental challenges of unprecedented scale and urgency.

Regular policy offers no solutions;
market creation and commodification is not a solution;
Incremental institutionalism is not sufficient

Ecosystem Services (the modern concept)

late 1970's: awareness (How much are nature's services worth?)

1990's: mainstreaming in literature and economic value estimation

Environmental economics

Market-based instruments,
payment for ecosystem services

2000's: in policy

2003: Millennium Ecosystem Assessment

Ecological economics

2012: The Economics of Ecosystems and Biodiversity

2019: Global Assessment Report on Biodiversity and Ecosystem Services
"Transformative Change"

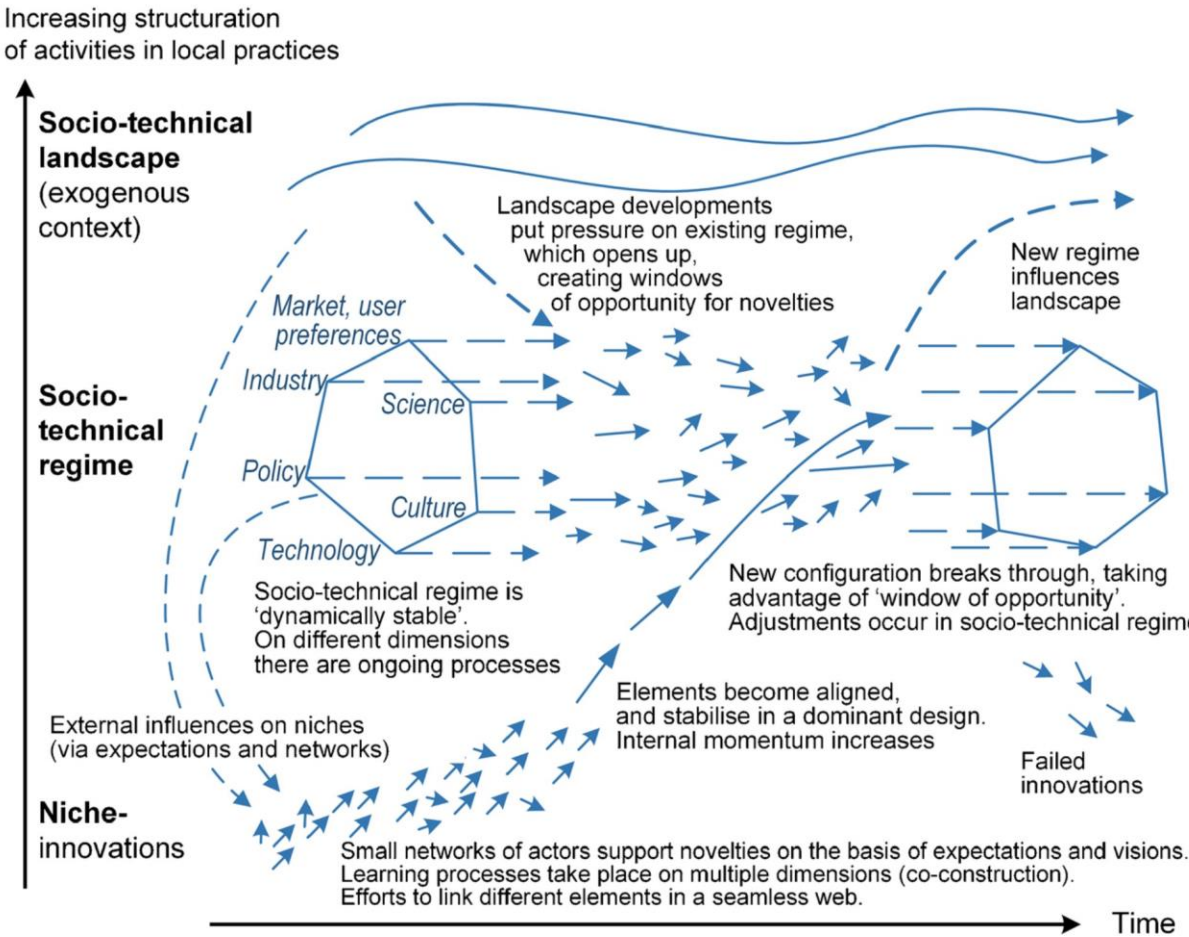
2021: The Economics of Biodiversity (Dasgupta review)
"Transformative Change"

Transition science

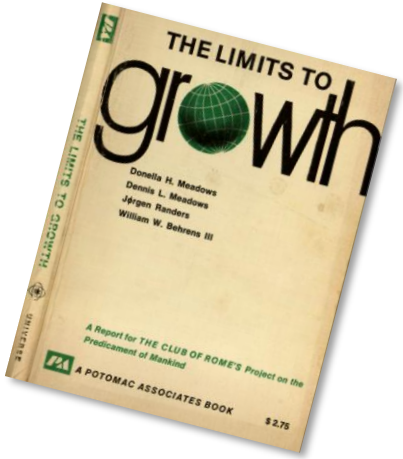
Multi-level Perspective (MLP) On Transitions

"Niche-innovations are important because they are the **seeds of transitions**. But "**the environment into which these seeds are sown** is, of course, the main determinant of whether they will sprout" (Mokyr, 1990)"

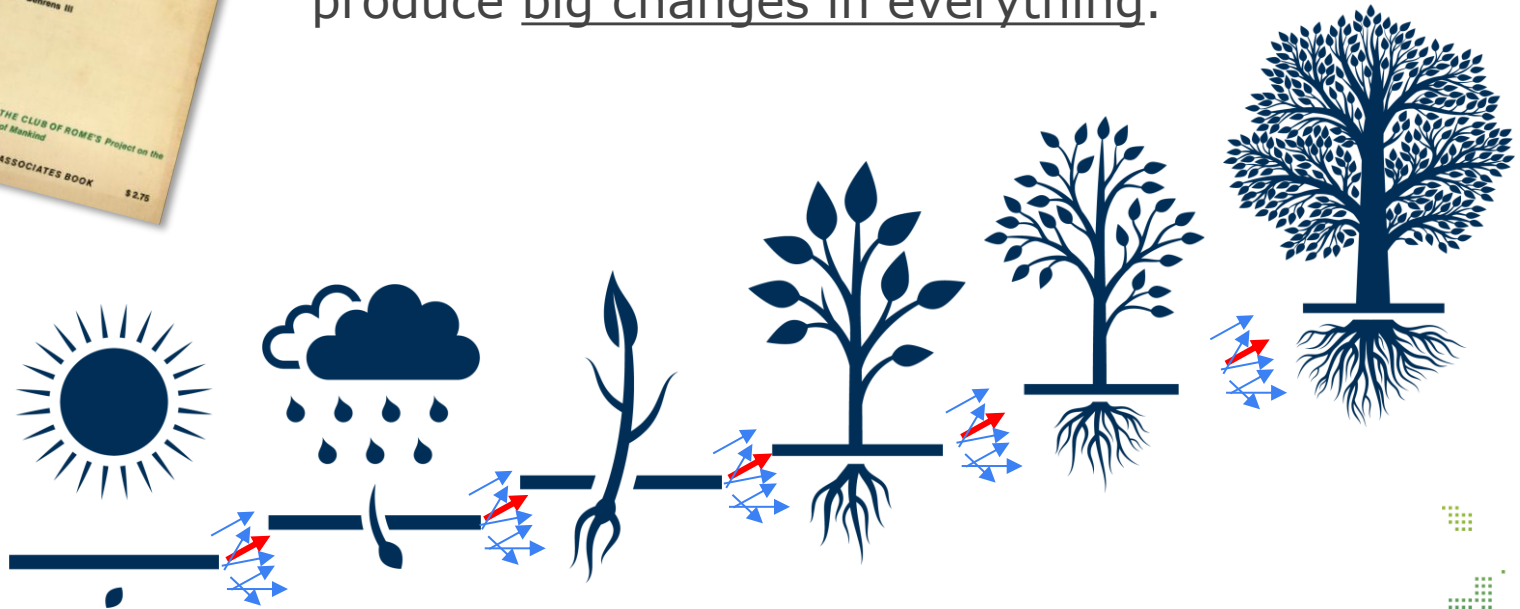
(Grin et al, 2010)



Systems Thinking – Leverage Points

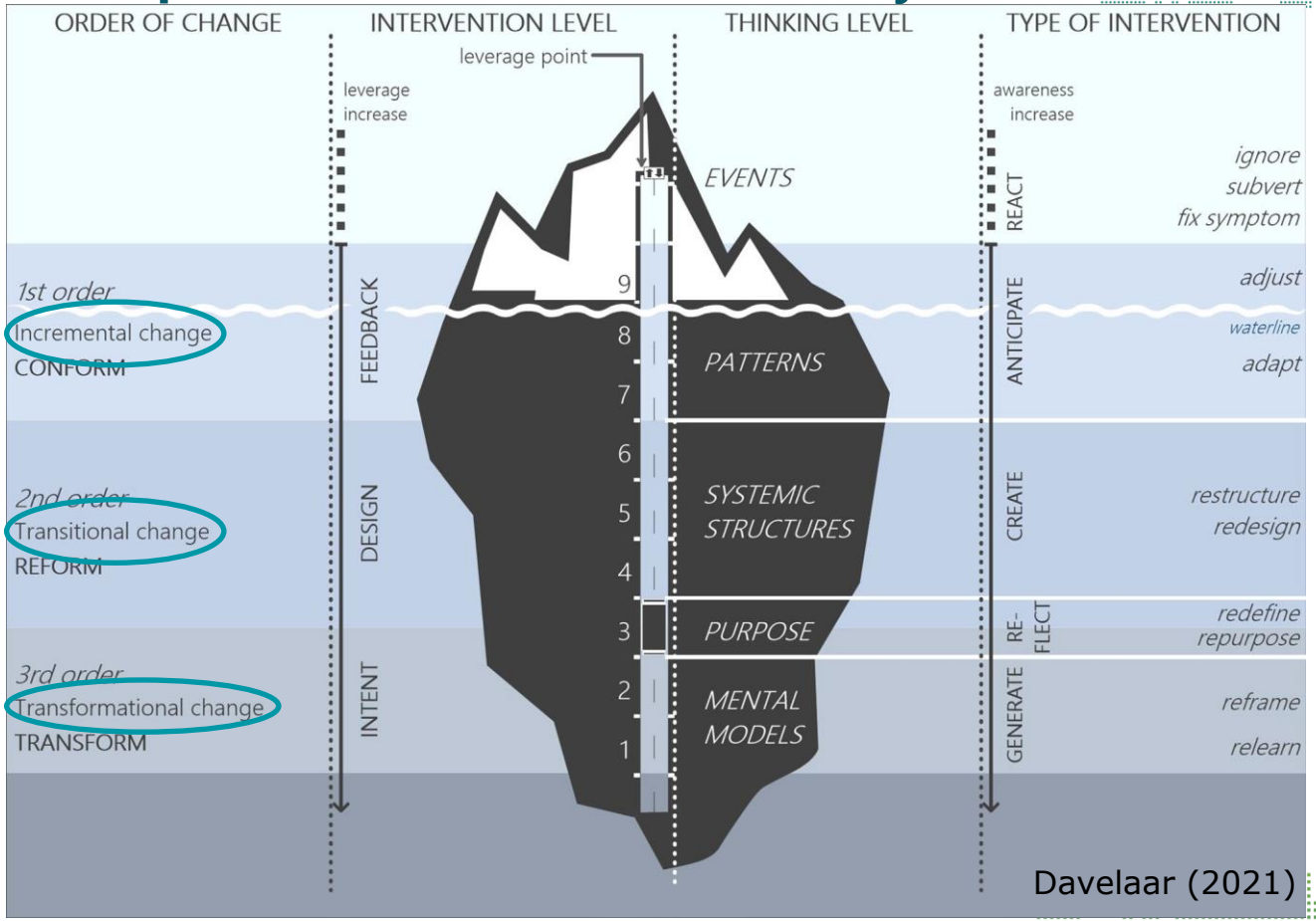


Leverage points (D. Meadows): “places within a complex system where a small shift in one thing can produce big changes in everything.”



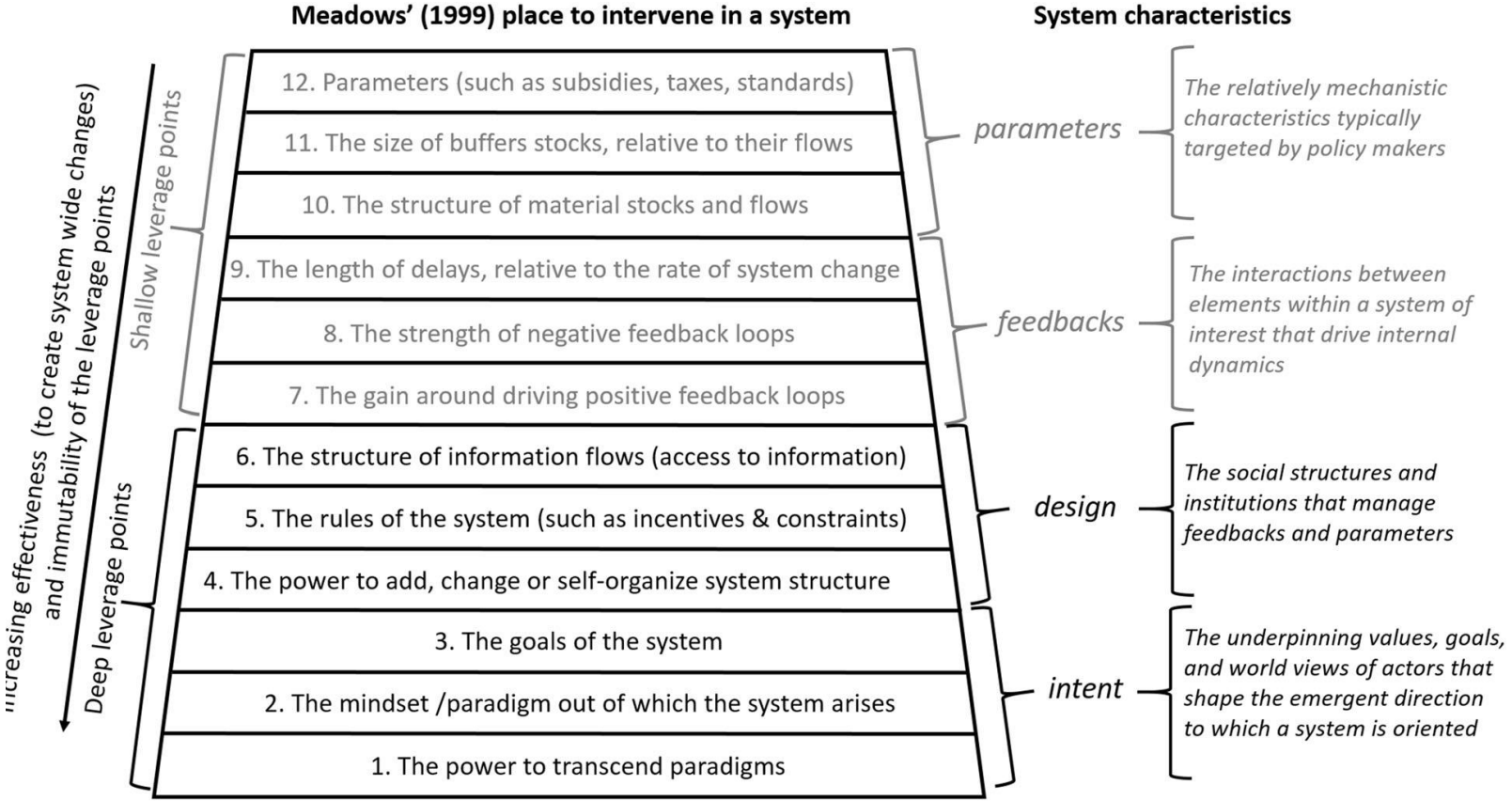
Leverage points – places to intervene in a system

12	Numbers - constants and parameters such as subsidies, taxes, standards
11	Buffers - the sizes of stabilizing stocks relative to their flows
10	Stock-and-flow structures - physical systems and their nodes of intersection
9	Delay - the lengths of time relative to the rates of system changes
8	Balancing feedback loops - the strength of the feedbacks relative to the impacts they are trying to correct
7	Reinforcing feedback loops - the strength of the gain of driving loops
6	Information flows - the structure of who does and does not have access to information
5	Rules - incentives, punishments, constraints
4	Self-organization - the power to add, change, or evolve system structure
3	Goals - the purpose or function of the system
2	Paradigms - the mind-set out of which the system - its goals, structure, rules, delays, parameters - arises
1	Transcending paradigms - (worldview, core metaphor, mode of thinking)



Davelaar (2021)

Weak versus Strong Leverage



(Abson et al., 2016)

Preference for Weak?

Weak leverage

"[…] *many sustainability interventions target* ***highly tangible, but essentially weak, leverage points*** *(i.e. using interventions that are easy, but have limited potential for transformational change).*"

"[…] to date, sustainability research and policy have primarily addressed relatively **shallow leverage point**s."

"policy interventions and dominant scientific discourses mutually reinforce one another, meaning that **shallower interventions are favoured in both science and policy**."

Weak leverage in relation to Strong leverage

However, while deeper leverage points shape and constrain the types of interventions available at shallower leverage points **it is possible that shallower leverage points may challenge or shift deeper leverage points**.

An understanding of such potential interactions between deep and shallow leverage points represents a **crucial gap in our current understanding of sustainability issues**.

(Abson et al., 2017)

Methodology

- National CoPs to preselect potential **Seeds of Transformative Change** (self-assessment bias, dominant paradigm bias, …)

- Analysis with **Transition Science + Systems Thinking** frameworks

- Selection and deeper analysis

➢ What are the traits of such Seeds?
➢ How can we help them sprout i.e. which enabling environments exist and can we create?

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