Transformation of Social-Ecological Systems

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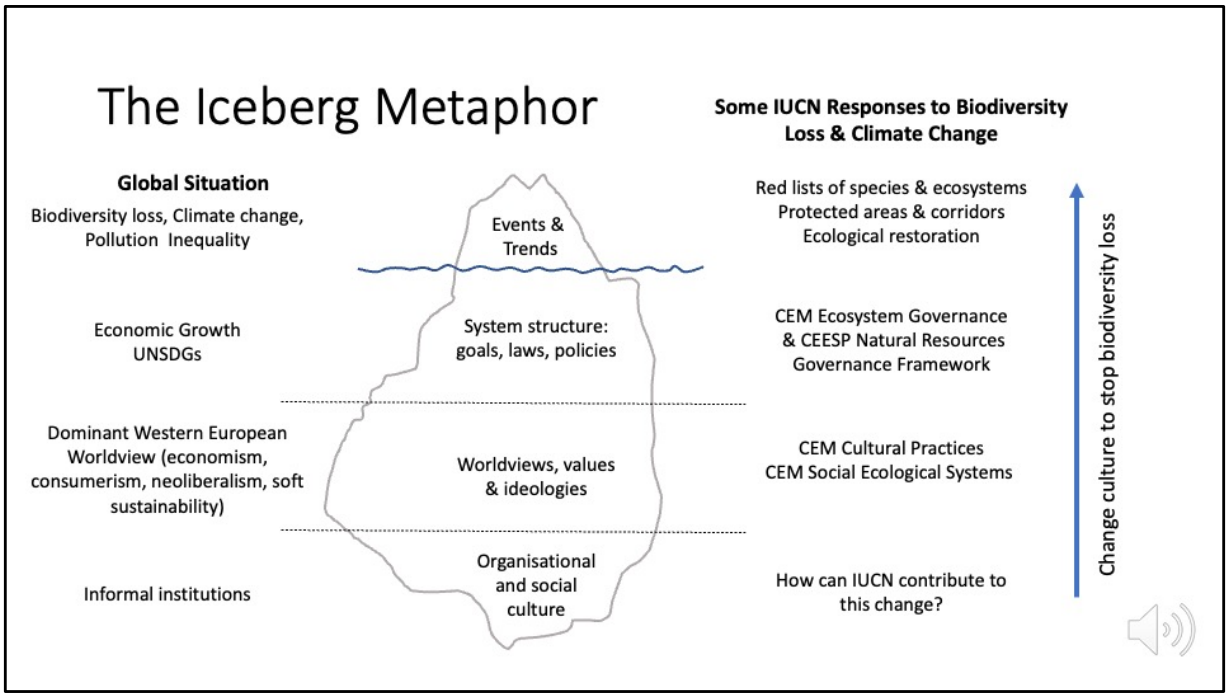
Hello everyone. I am going to provide you with a brief overview of some social-ecological systems concepts in relation to climate change and biodiversity loss.

Selected SES Concepts for Transformation

- The Iceberg for understanding underlying multiple causes in systems
- ***Poverty and rigidity traps in the adaptive cycle***
- ***Competitive exclusion as a system trap***
- The panarchy in relation to social change of system governance
- ***Levers for system change***
- ***Transformation pathways to change***

I will focus on system traps and how to break them, on leverage points for change and transformation pathways



The iceberg metaphor is a simple device for thinking about the deep underlying causality of the events and trends that conservationists respond to. It enables us to think about what IUCN is doing and what it might do differently. On the left we have the global situation of biodiversity loss, CC, pollution and inequality, on the right we have some typical IUCN activities such as red listing, protected area management and restoration

To address the global situation we need to go deeper to see that economic growth and UNSDGs are some of the multiple causes that create the current situation. If we want to change the social and economic systems that are driving biodiversity loss and climate change we need a change in the worldviews and culture of industrial societies.

How might IUCN contribute to this change? On the right of the iceberg are some examples of work being done by various groups on governance, cultural practices and SES in IUCNs commissions. How can this work be improved to influence socio-economic systems that are distant from IUCN?

Adaptive Cycle: A metaphor for understanding adaptation in a SES

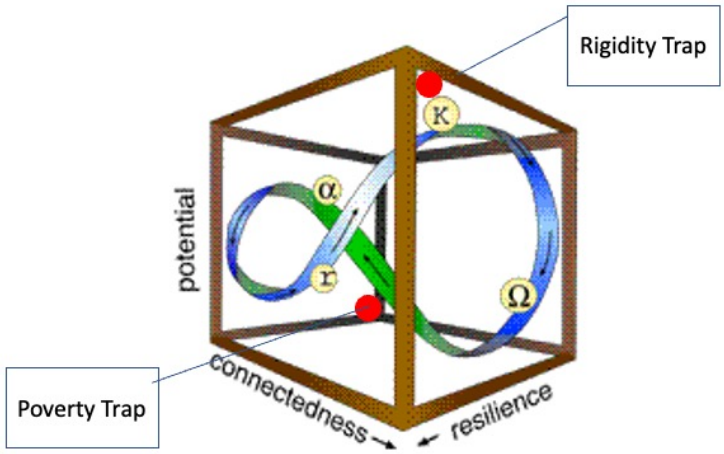


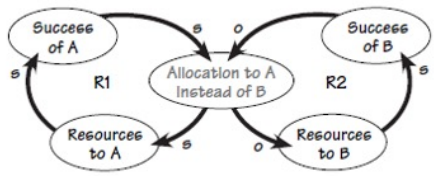
Image from (Holling 2004)

The adaptive cycle enables us to think about system traps. Adaptive systems constantly change over time. Maladapted systems get stuck in traps.

Rigidity traps develop over time as a system locks up all the potential for change (the wealth of the system) and the parts of the system become highly connected, resilience is high but a novel disturbance can precipitate collapse. A system in a rigidity trap is a system that needs to change in response to environmental change but cannot. The global economic system is in a rigidity trap because it is not responding effectively to climate change and biodiversity loss.

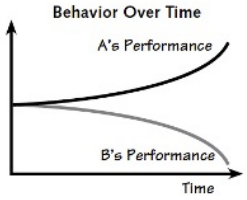
Systems become caught in a poverty trap when they do not have sufficient potential to grow and their components are disconnected. Many ecosystems, social systems and ecological systems are caught in a poverty trap and continue to degrade because of the global goal of GDP growth which enables some individuals and some nations to accumulate great wealth at the expense of others.

System Traps: Competitive Exclusion



S = act in same direction
O = act in the opposite direction
R = reinforcing or increasing the effect
B= balancing or bring back to equilibrium

Success of A enable A to accumulate more resources, power, etc. at the expense of B.



The wealth gap between A & B increases exponentially over time

Images from Kim & Lannon 1997 Applying systems archetypes. Pegasus Communications

Competitive exclusion is one of a number commonly occurring systems traps and is shown here as an example of how simple feedback models enable us to understand maladaptation.

Inequality is a major problem in social systems within nations and between industrial nations and so-called underdeveloped nations. It is a major feature of dysfunction in governance systems that results in institutionalized poverty and environmental degradation. Those with power have the ability to influence governance so that they accumulate more power at the expense of the poor and the biosphere. This is what capitalism does and it is what drives biodiversity loss, ocean and atmospheric pollution, and poverty.

Policy interventions that redistribute wealth will break the trap but this requires a cultural change in industrial societies.

The same trap provides us with a way to understand the enormous injustices done to IP, the efforts of western scientists to deny the value of indigenous knowledge and the difficulties that YP have in gaining a seat at the table in IUCN.

Panarchy – a metaphor for understanding change

Revolt is the equivalent of a reinforcing feedback that creates change within a system.

Remember is the equivalent of a balancing feedback which prevents or slows the rate of change.

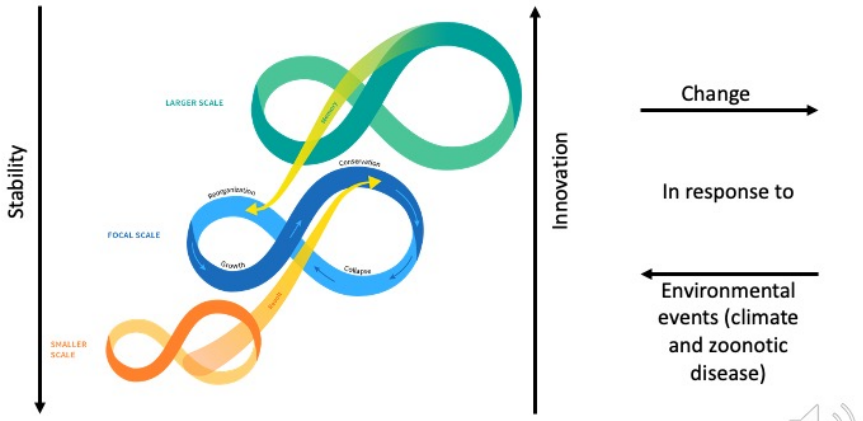
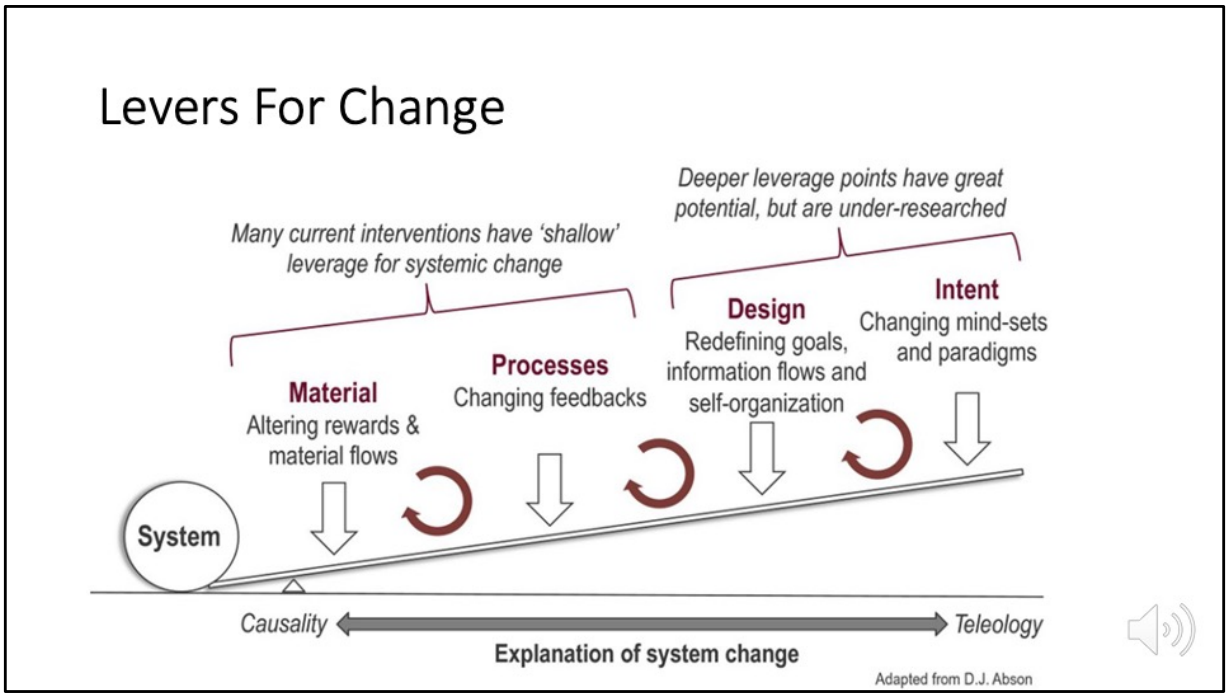


Image from Wayfinder work card 20

The panarchy is a model that helps us to think about how we can create system transformation. Small scale systems change quickly, large scale systems change slowly.

Worldviews and governance institutions are large scale systems in human society. They create stability for the management of human affairs but they can also lock-in injustices and they are slow to change when change is needed.

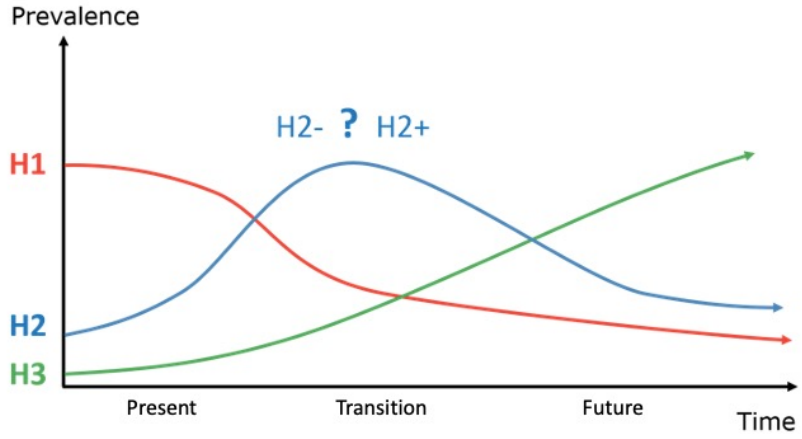
Innovation occurs in small systems, and if successful can spread to create change in larger systems. External events such as extreme weather or disease can affect the outcome of social change movements.



The concept of change levers is based on systems thinking and illustrates the different ways in which interventions might be applied to change a system. These levers interact and their ability to create change increases from the bottom to the top. Deeper leverage points have the potential to create the kinds of change needed to provide an effective response to climate change and biodiversity loss but are more difficult to apply than shallow leverage.

Policy interventions typically use material and process levers in response to events and trends. Transformation of the relationship between people and nature requires us to change the goal of economic growth and this will not happen until there is widespread mindset change within industrial societies.

Three Horizons Transformation Pathways



Sharpe, B., A. Hodgson, G. Leicester, A. Lyon, and I. Fazey. 2016. Three horizons: a pathways practice for transformation. Ecology and Society 21(2):47

This metaphor is a useful way of thinking about how social change might occur over time.

Prevalence reflects the extent to which a particular pattern dominates the issues of concern (e.g., a set of values or widely accepted way of doing things) and the horizons indicate how these may change over time.

Horizon 1: current systems in decline

Horizon 2: intermediate systems of innovation & experimentation. H2- are innovations that fail and H2+ represents innovation that becomes part H3.

Horizon 3: desirable future composed of some parts of the old and system and some new parts.

If you would like more information on the practical application of systems concepts to conservation issues you can join CEM's Resilience Theme Group https://www.iucn.org/commissions/commission-ecosystem-management/our-work/cems-thematic-groups/resilience

You can also learn by doing using the https://wayfinder.earth/the-wayfinder-guide/ for a complete overview of how to apply social-ecological systems thinking to ecosystem management

Learning to think in terms of systems is an essential compliment to the cause and effect thinking that we are taught at university. Systems thinking is one of the deep leverage changes required if humanity is to survive and thrive in a climate change world.

Understanding how systems change is valuable to the struggle of IP for sovereignty and respect, and it is valuable to YP who want more influence over the affairs of IUCN. Both of these changes are essential if society is to respond effectively to climate change and biodiversity loss.