

Sustainability transformations in a complex world: shifting perspectives

Prof Belinda Reyers

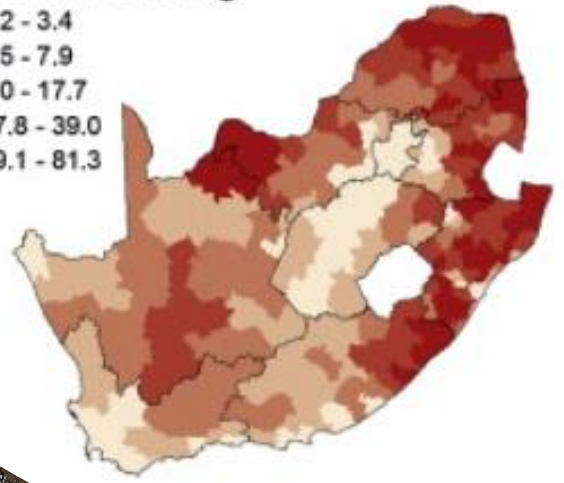
University of Pretoria, South Africa
Beijer Institute of Ecological Economics,
Royal Swedish Academy of Sciences

Nigerian Artist: Jerry Buhari, Fall and Spill History, 2005



Wood for cooking

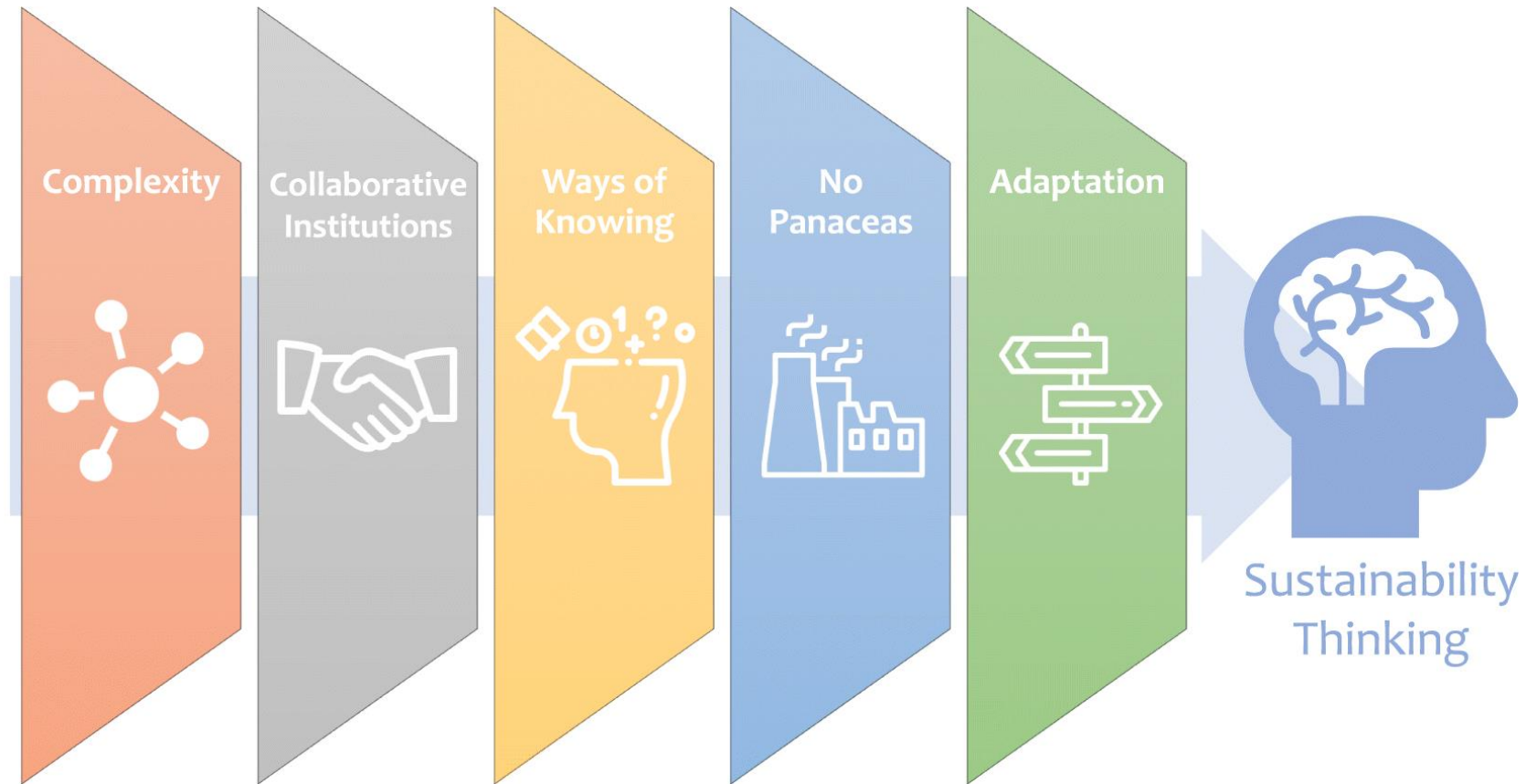
- 0.2 - 3.4
- 3.5 - 7.9
- 8.0 - 17.7
- 17.8 - 39.0
- 39.1 - 81.3





Transformative research

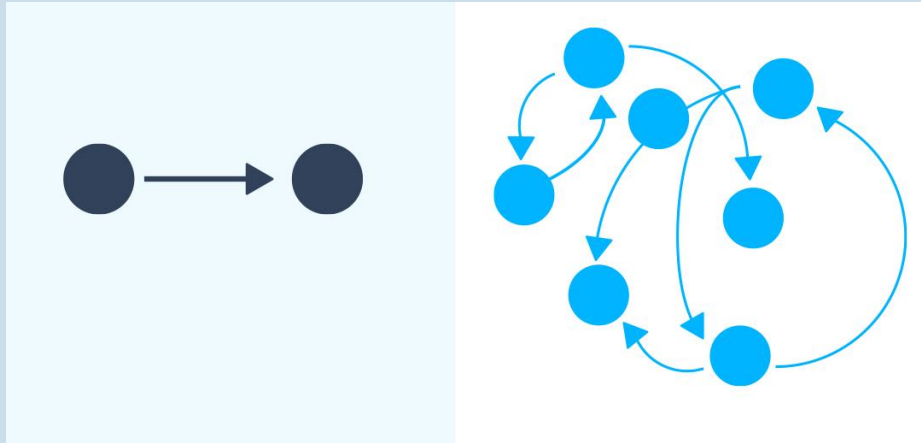
Sustainability transformations: the how



Loring. 2020. Threshold concepts and sustainability: features of a contested paradigm.

“Threshold concepts describe the core concepts that people must master if they are to effectively think from within a new discipline or paradigm”

Complex systems and their challenges



Difference of type, qualities and properties

- *Cause and effect*
- *Parts and whole*
- *Inputs and outputs*
- *Problem and solution*

“Complex systems are not rare. Complex systems are the usual, normal case. All living systems, all psychological systems, all social systems are complex. It is complicated systems that are highly distinctive, very special, and therefore rare.”

Poli, R. 2013. *Cadmus* 2(1):142-147

Key features of complex social-ecological systems



Photographer:
Dwayne Senior/Bloomberg via Getty Images

- Are determined more by relationships than parts
- Are radically open
- Have adaptive capacities
- Are contextually determined
- Are shaped by dynamic processes
- Have novel qualities that emerge through complex causality

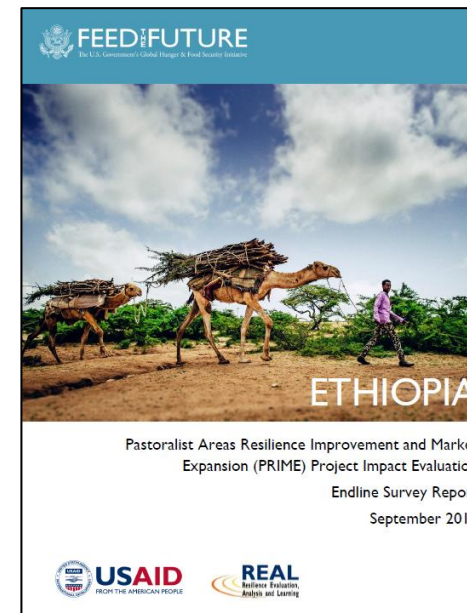
Implications: **what** should be studied and considered; and **how** to choose methods and approaches

Sustainability transformations: shifts in the how

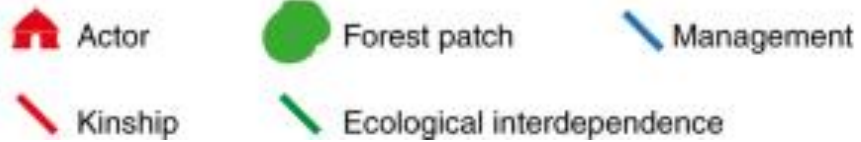
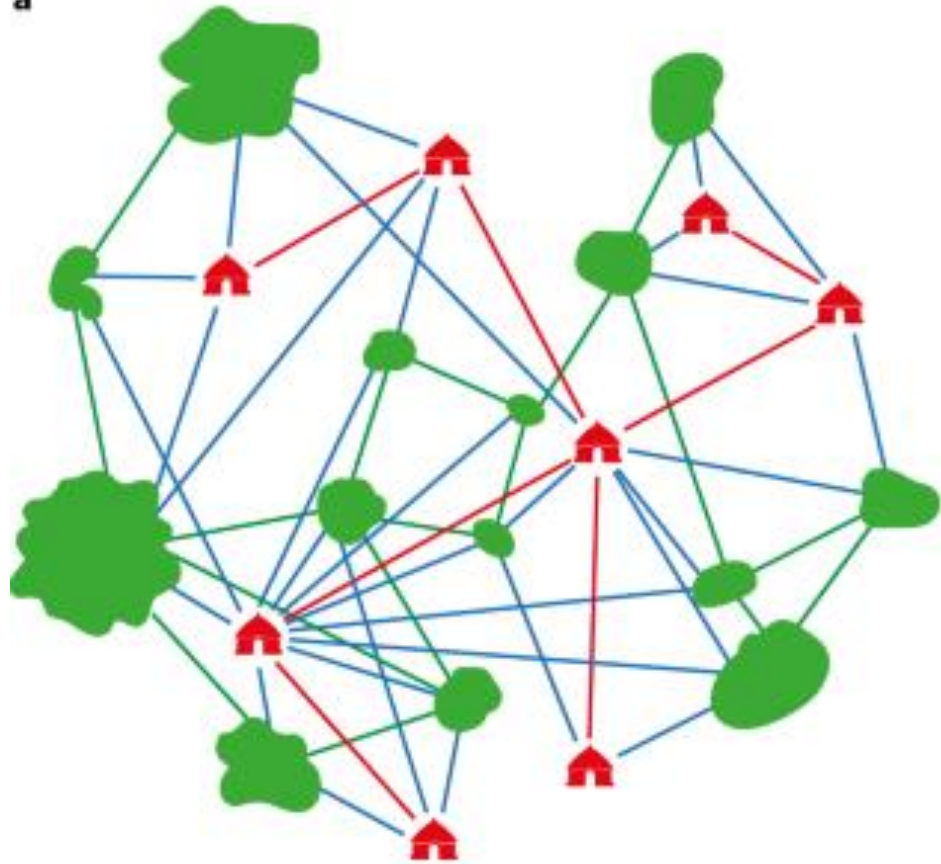
Six shifts to account for features of complex systems

Features	Shifts in focus and approach
Relational	From objects to relations
Open	From closed to open systems
Adaptive	From capitals to capacities
Contextual	From generic interventions to context-sensitivity
Dynamic	From outcomes to processes
Emergent	From linear to complex causality

> 40 large reviews, syntheses and evaluations of sustainable development programs & projects across 6 continents between 2010-2021



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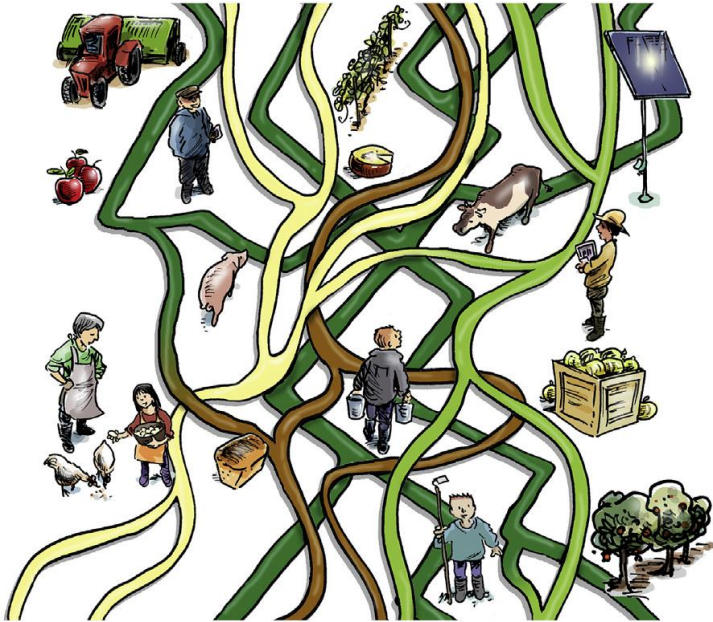
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Objects to relations

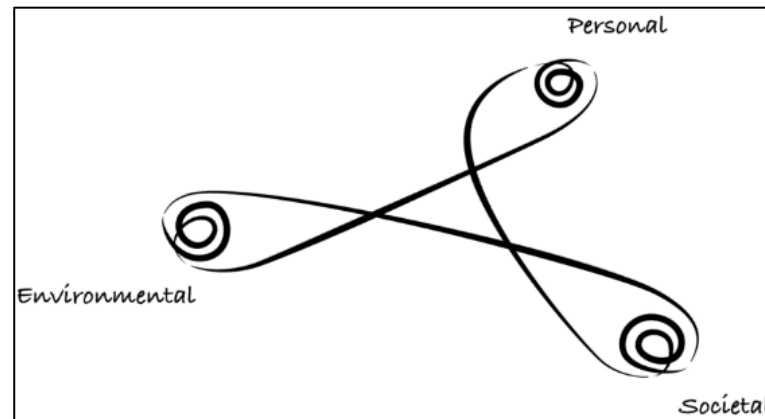
From a focus on distinct, independent objects, to the dynamic relationships making up the whole

Bodin, et al. 2019

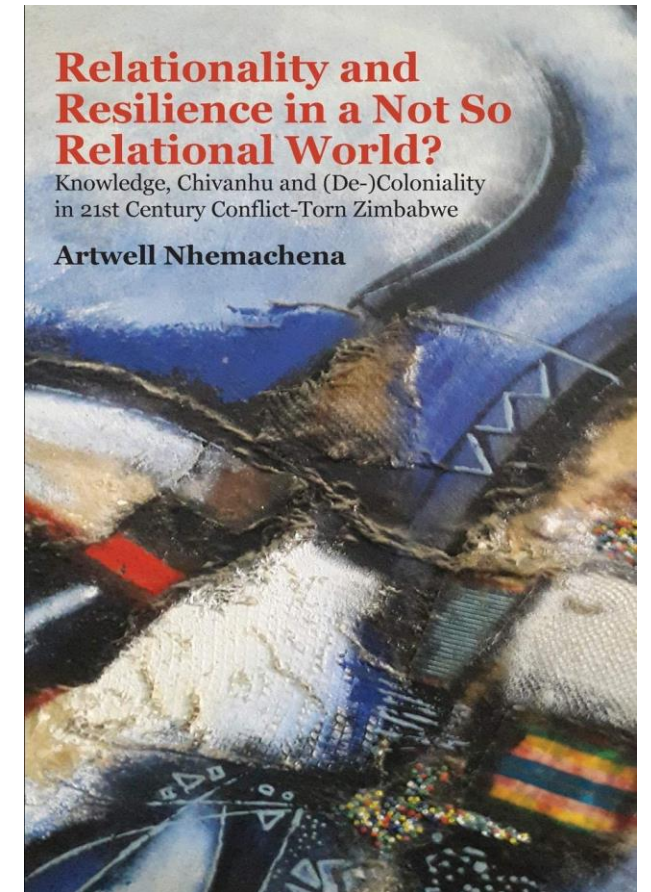
Objects to relations



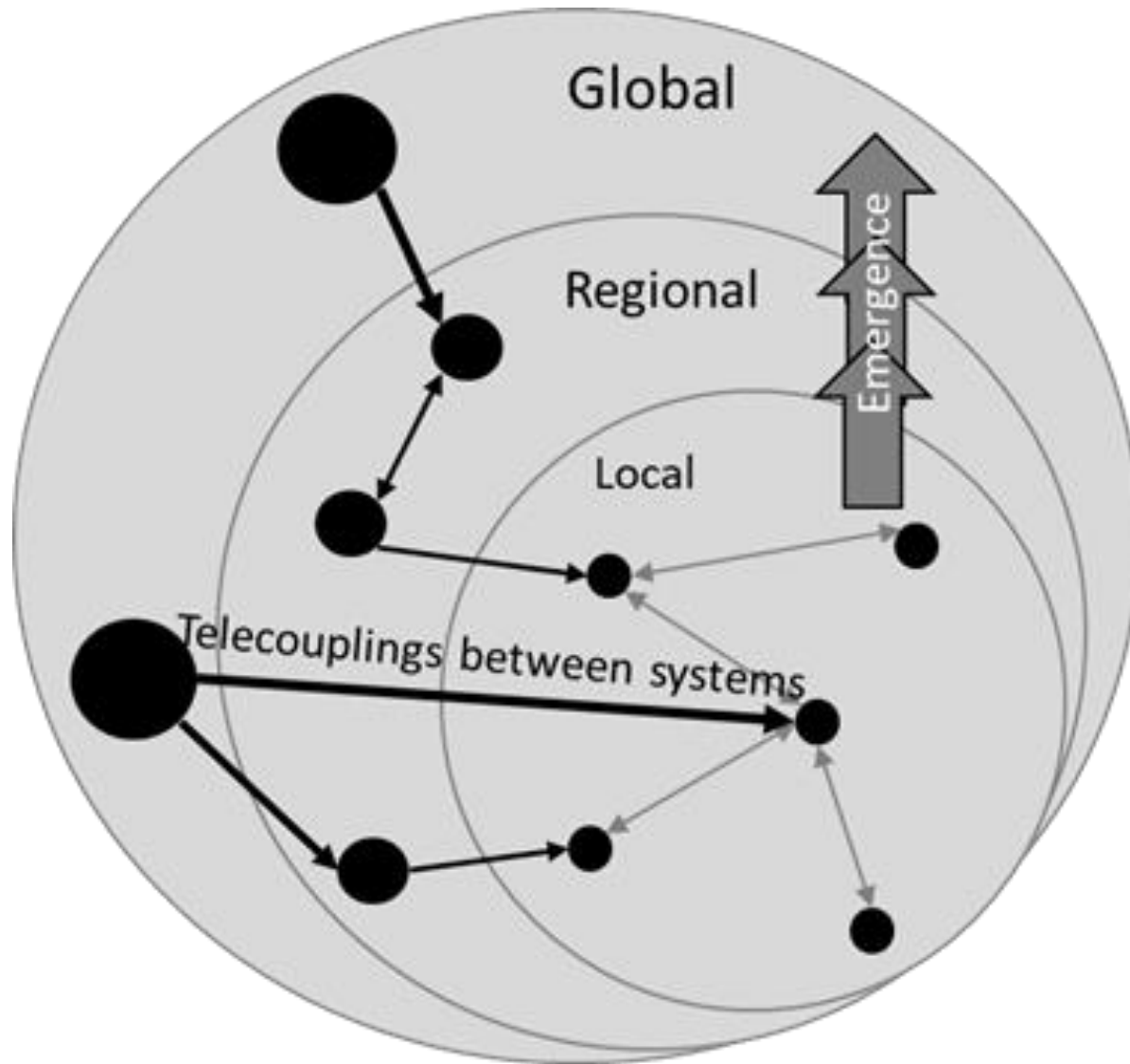
Resilience of family farms emerges from the ability to make and remake relations spanning biophysical processes and social forces (Darnhofer *et al.* 2016)



Human wellbeing as active and dynamic, constituted through the interplay of personal, social and environmental processes (White *et al.* 2017)



African [Shona] modes of engagement known as Chivanhu surface the underplayed and dismissed interdependencies and interconnections required for peace making and peace building (Nhemachena 2017)

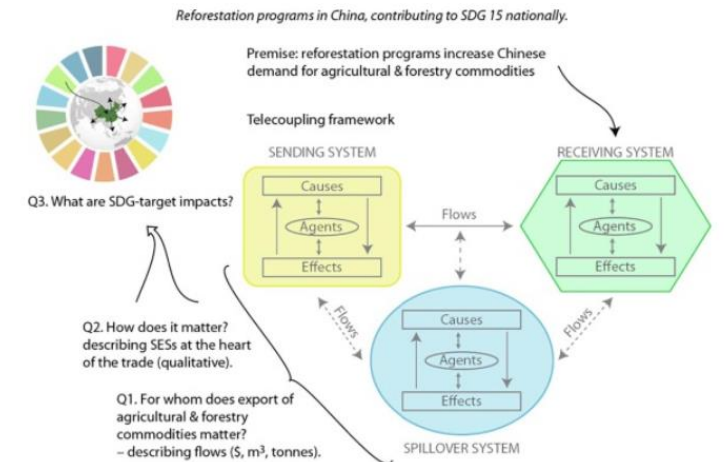
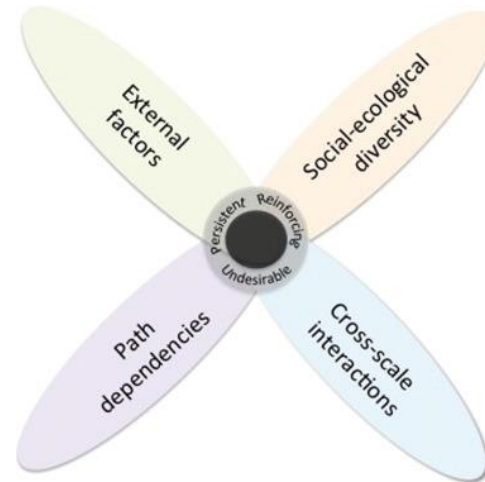
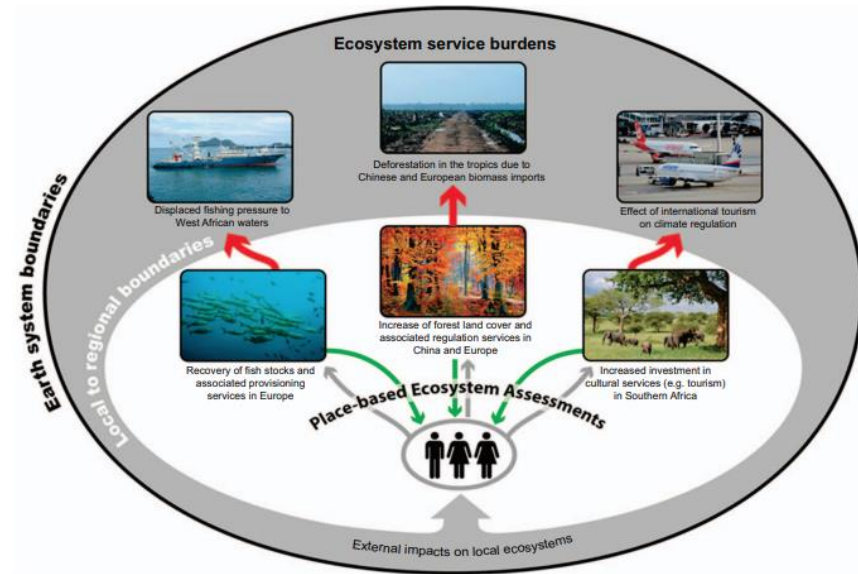


Closed to open

From determined and static boundaries to porous, dynamic and fluid boundaries.

Reyers *et al.* 2018

Closed to open



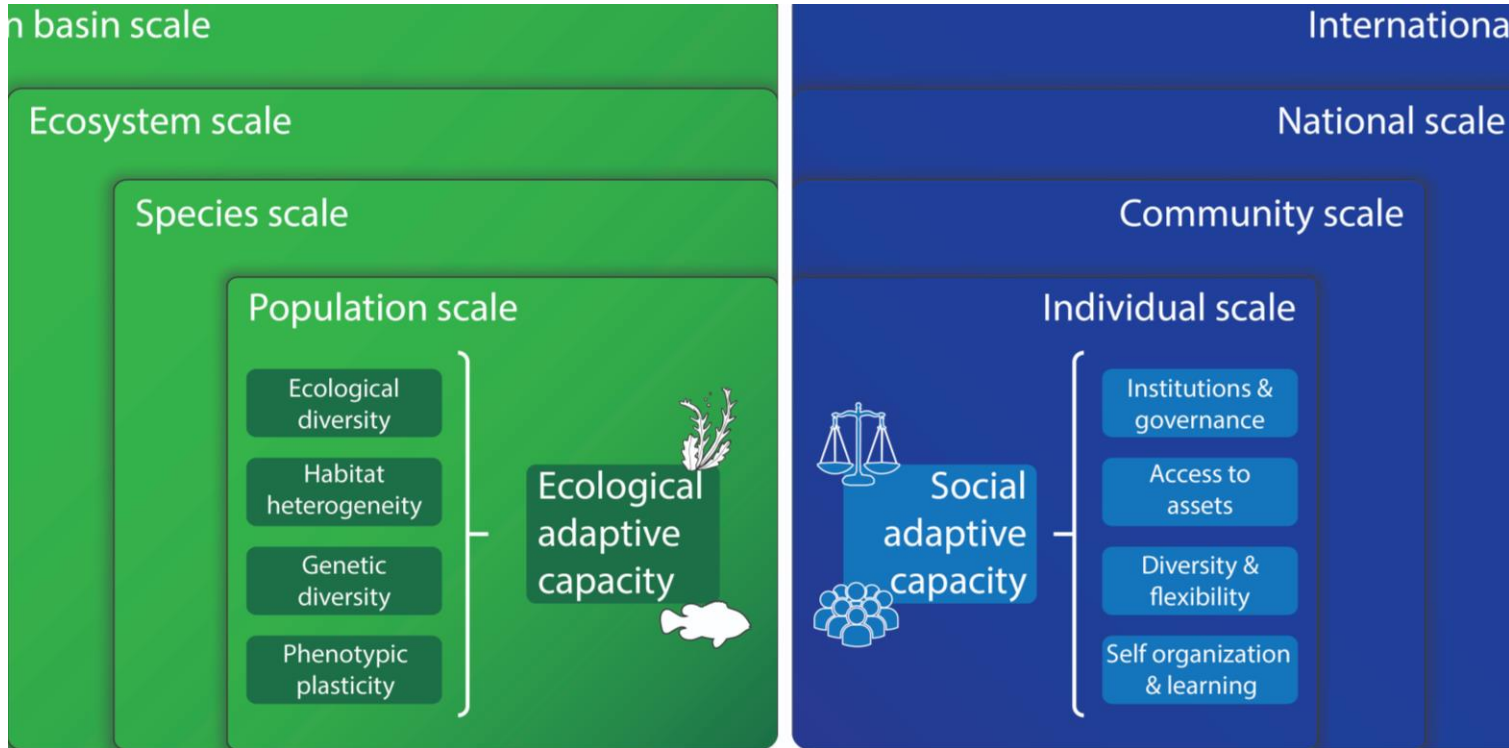
Assessments often overlook distant, diffuse and delayed impacts that are critical for global sustainability: sustainability blindspots (Pascual *et al.* 2017)

Poverty traps require new understanding on scale mismatches linked to traps and external factors that reinforce traps (Haider *et al.* 2018)

Tracking global-level impacts of national sustainability initiatives finds that sustainability progress in one country from reforestation is cancelled out by the deforestation and cross-sectoral impacts supporting this reforestation abroad. (Downing *et al.* 2021)

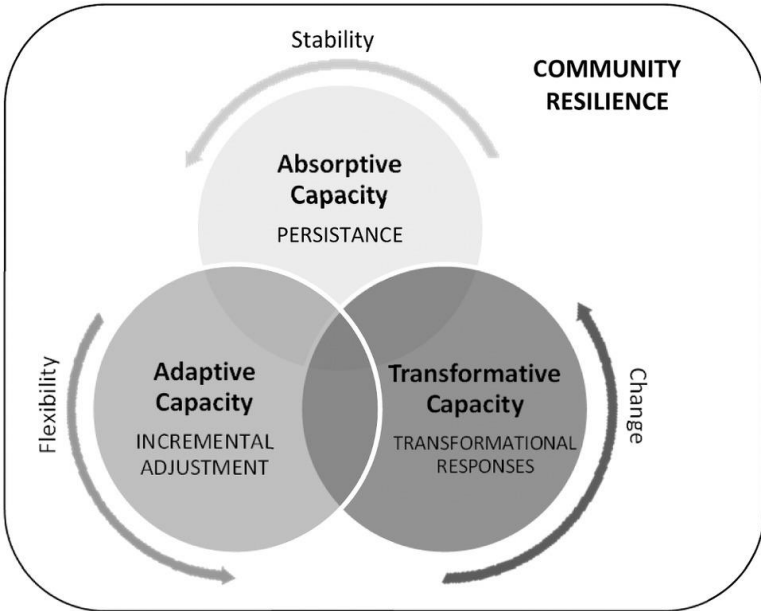
Capitals to capacities

From a focus on natural and anthropogenic capitals to an understanding of the dynamic capacities that shape responses to change.



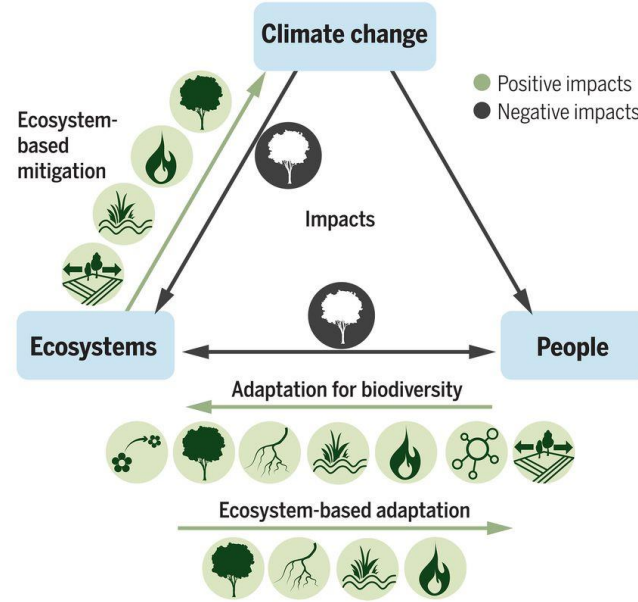
Witney *et al.* 2017

Capitals to capacities

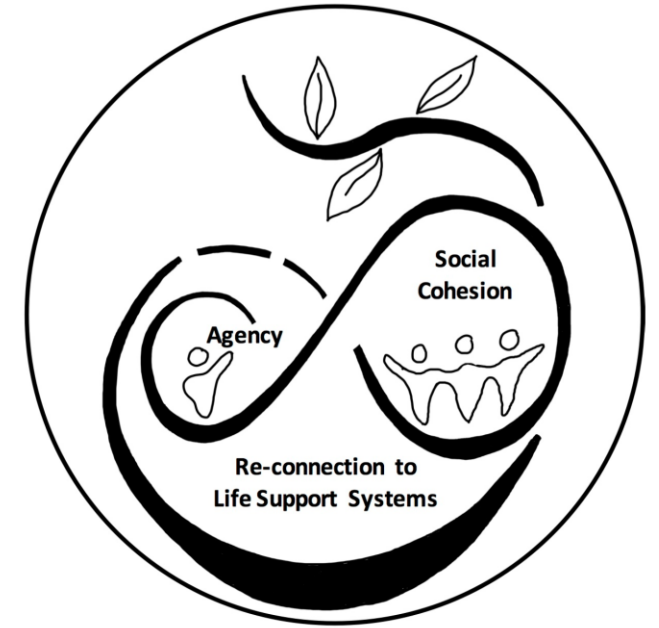


Qualitative assessment of earthquake resilience in Old Dhaka using different participatory approaches (Hasan & Kadir 2020)

- Reforestation
- Forest creation in unsuitable areas (negative)
- River restoration
- Wetland restoration
- Protection and expansion of natural/ seminatural areas
- Increased connectivity
- Species translocation
- Natural fire regime restoration



By restoring natural ecosystem processes, resilience and a wide range of adaptation strategies are developed (Morecroft *et al.* 2019)



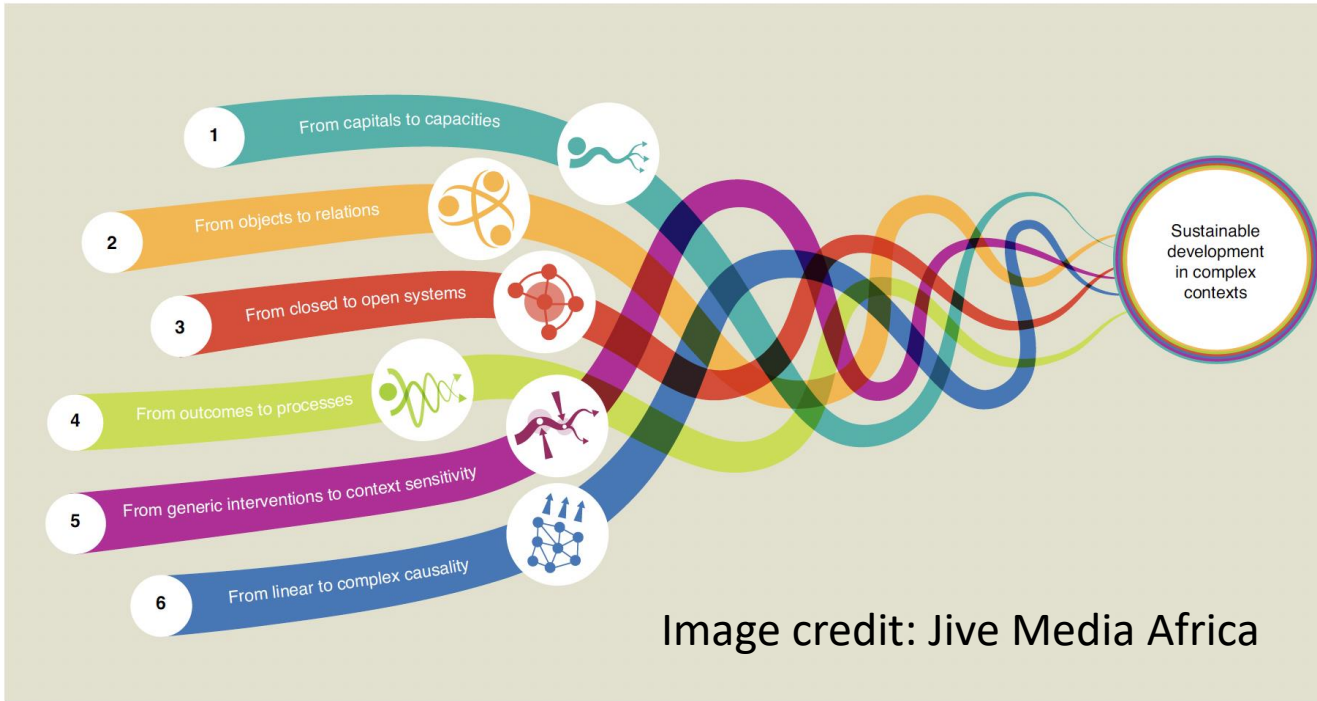
Transformative Capacity

To cultivate transformative capacity: (1) an awareness of and a re-connection to life support systems; (2) a well-developed sense of agency; and (3) social cohesion (Ziervogel *et al.* 2016)

Challenges and barriers

- Discourse vs. practice
- Pockets vs. programs
 - Funding, design, evaluation
 - Philosophical and methodological compromises
- Marginalisation of existing capacities to engage in complex contexts
- Evidence of increasing and redistributed vulnerability

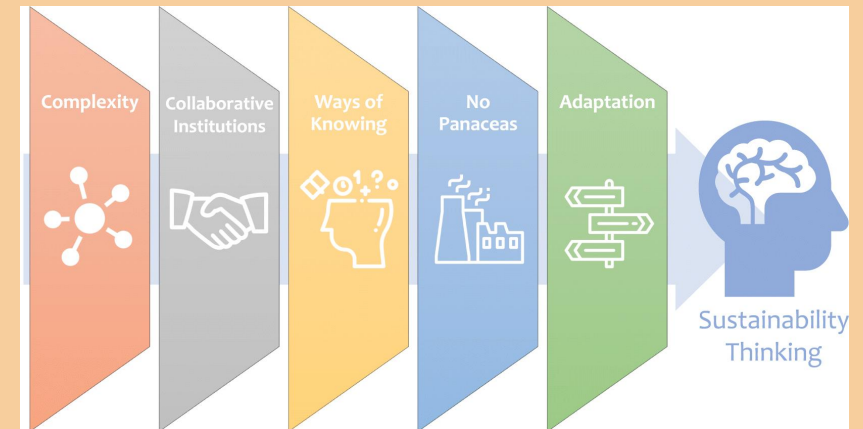
Manyena et al. 2019, Eriksen et al. 2021, Siders 2019, Douthwaite & Hoffecker 2017.

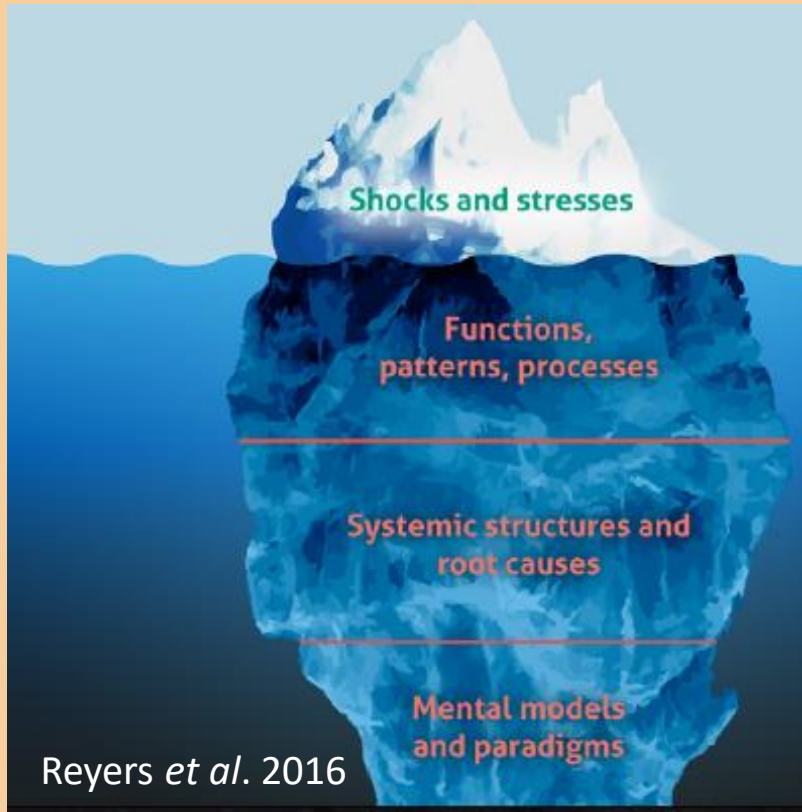


“Progress made in one shift enables progress in others, with the shifts themselves being intertwined” (Reyers *et al.* 2022)

One way and intertwined

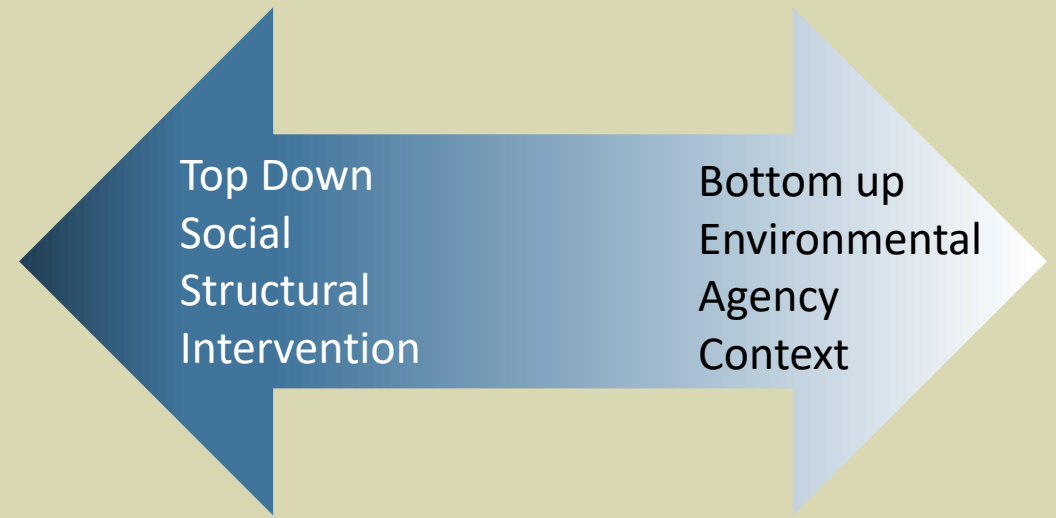
Threshold concepts are doors or portals to a “new way of understanding the world”. They only open one way; one “cannot easily return to seeing the world only through the previous paradigm” (Loring 2020)





Complex **problems**
as symptoms

Complex problems
as emergent
outcome of
patterns of rules,
relationships,
incentives, power



“Fruitful perspectives at a site outside these dichotomies”
Gould

Changing the how: finding fruitful perspectives