Perverse resilience: A systematic review of traps in social-ecological systems

Jamila Haider∗†, Nanda Wijermans, Garry Peterson, and Maja Schlüter

1Stockholm Resilience Centre (SRC) – Stockholm Resilience Centre Stockholm University Kräftriket 2B, SE-114 19 Stockholm, Sweden

Abstract

To be considered for the session: Tips or Traps? Advancing understanding to steer clear of impoverishment traps and tipping points (Chairs: Niki Frantzeskaki and Keith Tidball)

Abstract: The ability of people, societies and ecosystems to adapt and transform in the face of shocks and on-going stresses is essential for maintaining long-term resilience. However, many situations have been identified in which social-ecological systems persist and exhibit short-term resilience, inhibiting efforts to adapt or transform. We consider such situations to be traps: undesirable situations in which reinforcing feedbacks prevent a shift to a new trajectory. While traps have been studied and identified in the economic, ecological, and development literature, there has been little effort to systematically identify how traps are created and escaped from. Despite the growing literature of traps, there is still limited understanding about the mechanisms that actually create and maintain these traps: what distinguishes a trap from an undesirable situation?

To address this gap we conducted a systematic review of the literature to 1) identify characteristics and features of traps across dominant research fields and consolidate results of proposed interventions; 2) understand key mechanisms, both drivers and feedbacks, that maintain traps in linked agro-ecological systems; 3) identify research gaps from a social-ecological perspective.

Preliminary Results:

1) In traditional development and economic theory, the concept of a trap is based on the assumption of linear growth (i.e. Rostow’s stages of growth and the big push model) that a minimum asset level needs to be achieved in order to escape from a trap. Current documented interventions often reinforce existing feedbacks that keep the system in its undesirable state, rather than enable transformation.

2) Feedback mechanisms are explicitly mentioned in most cases of agricultural development traps, whereas drivers are often unspecified, though an undesirable initial state is present in almost all cases analyzed. These preliminary results reflect the difficulty in empirically identifying traps before they emerge.

∗Speaker
†Corresponding author: jamila.haider@stockholmresilience.su.se
3) The interactions of traps across scales are poorly documented and understood. Specifying interactions between social and ecological dynamics, which enable and maintain trap dynamics are essential for proposing alternative outcomes. Specifically, incorporating ecological limits into current social-ecological trap models is essential in creating realistic exit scenarios that are not based on financial capital inputs alone. Based on this review, we are developing a typology of traps that can be used to understand how social-ecological interactions and feedbacks in specific contexts shape opportunities for adaptation and transformation. We use Agent Based Modeling to test hypotheses of trap mechanisms and interventions, and to alter strength and/or existence of feedbacks. Ultimately the typology may help improve decision-making on appropriate interventions by advising which interventions may be effective on given trap types.

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