

INSIGHT #1 TRANSFORMATIONS

# Resilience thinking can help us understand how to initiate and navigate large-scale transformations in social-ecological systems

**Despite pleas for major change, there is still a lack of understanding of the mechanisms and patterns involved, and of the conditions under which critical transformations can emerge.**

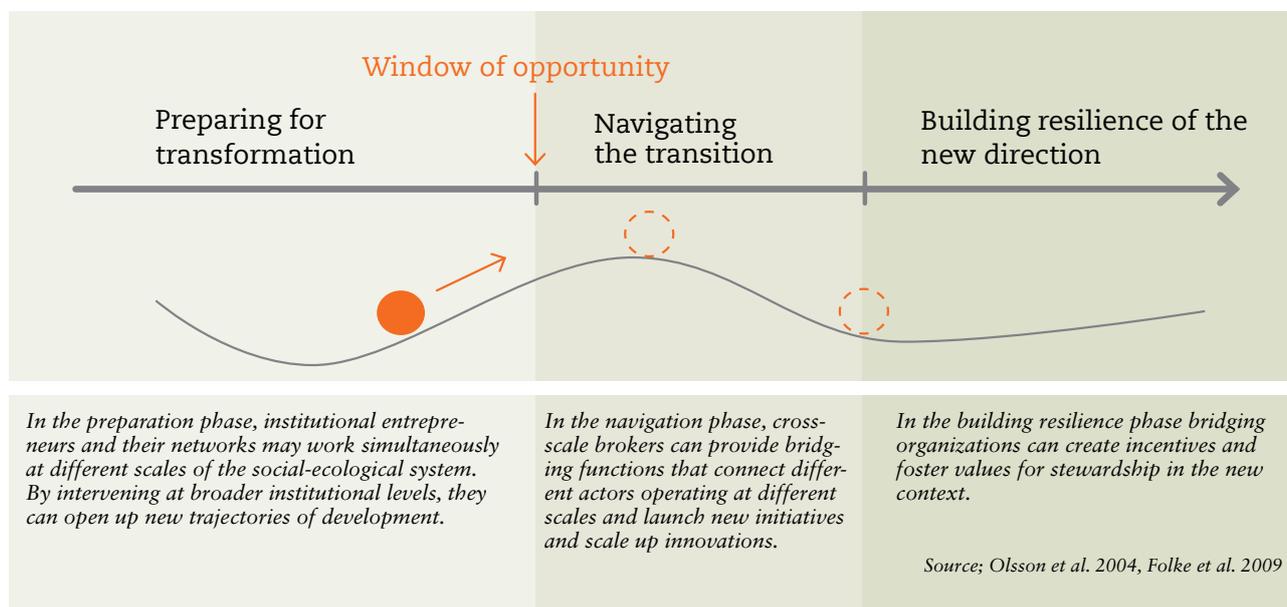
This lack of understanding greatly decreases the chances for successfully navigating transformation and embarking upon sustainable trajectories. Research at Stockholm Resilience Centre focuses on bridging this gap. Transformation involves the ability to steer away from undesired regimes and shift social-ecological systems into new improved trajectories that sustain and enhance ecosystem services and human wellbeing.

Research at the centre explores the interrelations between agency, networks, institutions, and innovation, and how we can initiate and navigate shifts and large-scale transformations towards global sustainability (e.g. Olsson et al 2008). This research is based on a variety of studies, such as the development of shadow networks in Southern Sweden, shifts in fishery management in Chile and small-scale farm innovations in sub-Saharan Africa.

All the studies provide insights into mechanisms for reversing trends that threaten critical thresholds in the Earth system (Westley et al. 2011). In these studies three main phases of transformations in social-ecological systems have been identified: 1. Preparing for transformation, 2. Navigating the transition, and 3. Building resilience of the new direction (see page 2 and figure below). Other major findings are that the first and second phases tend to be linked by a window of opportunity, and that institutional entrepreneurship and transformational leadership play important roles in moving through these multiple phases.

*“Transformation or transformability in social-ecological systems is defined as the capacity to create untried beginnings from which to evolve a fundamentally new way of living when existing ecological, economic, and social conditions make the current system untenable.”*

GUNDERSON AND HOLLING 2002, WALKER ET AL. 2004; FOLKE ET AL. 2010



## KEY FINDINGS:

### **Transformations involve incremental as well as abrupt change at many different scales**

There are no blueprints or recipes for sustainability transitions. Empirical studies show that transformations that reconnect people to the Biosphere are multi-level and multi-phase processes that involve incremental as well as abrupt change. Transformational change is needed for moving out of “bad states” (social-ecological traps) or steering away from potential critical thresholds.

### **There are at least three recognizable phases of transformation in social-ecological systems**

In the *Preparation phase* (1), experiments can be important by ‘beta testing’ alternative policy options and solutions that can be ready when an opportunity comes along. The ability to co-ordinate experiments that contribute to system innovation is of crucial importance to release lock-ins and enable transformations into new trajectories of sustainability (Biggs et al. 2010, Gelcich et al. 2010, Olsson and Galaz 2011).

In the *Navigation phase* (2), institutional entrepreneurs successful in scaling up social innovations such as new institutional arrangements and governance modes within an opportunity context have an ability to create the right links, at the right time, around the right issues (Olsson et al. 2007, Olsson et al. 2008, Olsson and Galaz 2009, Ernstson et al. 2010, 2011).

In the *Building resilience phase* (3), bridging organizations are important for initiating and mobilizing social networks of key individuals for collaborative problem solving as part of the new governance mode. Bridging organizations are also key nodes and can foster horizontal and vertical interactions in new, multi-level governance modes that support ecosystem stewardship (such as adaptive governance and polycentric governance) (Olsson et al. 2004, Chapin et al. 2010).

Phases 1 and 2 are often linked by a window of opportunity (Olsson et al. 2004, Olsson et al. 2008, Chapin et al. 2010, Gelcich et al. 2010).

### **Institutional entrepreneurship and transformational leadership play an important role in moving through these multiple phases**

Especially for opening new pathways, spanning governance scales, overcoming barriers to change, and seizing opportunities to scale-up and institutionalize new ideas.

### **There is a clear link between crisis and opportunity for creating radical shifts and transformations**

Crises, biophysical or social (food, climate, and financial crises), can trigger opportunities for launching and scaling up new natural resource management and governance approaches. In Chile, a rapid decline in valuable stocks of marine resources triggered fishermen to use the turbulent political change in the late 1980’s as an opportunity to initiate a shift from open-access extraction of marine benthic resources to community-based marine tenure (Gelcich et al. 2010). This research shows how agency emerges in crisis situations and connects networks for action (Österblom and Sumaila 2011).

### **“Shadow networks” play an important role in experimenting and finding new solutions to global environmental problems**

Shadow networks are informal networks that emphasize political independence outside the fray of regulation and implementation in places in which formal networks and many planning processes fail. In Kristianstad Vattenrike, Sweden, a shadow network initiated collaborative experiments to reduce nutrient loads to the rivers (Olsson et al. 2006). These experiments generated innovations that helped develop new approaches to steer clear of potential thresholds and enhance the fit between the ecosystem and governance systems.

### **Innovations can break self-reinforcing feedback loops that keep social-ecological systems on an undesired trajectory or in a lock-in trap**

Feedback mapping can be a powerful tool to help clarify for example when, where and how small-scale farm innovations can break these loops and enable communities in dryland sub-Saharan Africa to escape poverty traps, shift livelihoods, and secure long-term provisioning of ecosystem services (Enfors 2009).

### **Resilience thinking adds the social-ecological system perspective to transitions toward global sustainability**

Societies may undergo major transformations in important parts or sectors without improving their capacity to learn from, respond to, and manage environmental feedback from dynamic ecosystems. For example, a systemic shift to biofuels might slow climate change but lead to destructive land-use change and biodiversity loss. This in turn can lead to further ecological degradation, regime shifts, and lock-in traps in social-ecological systems that are difficult to escape (Olsson and Galaz 2011). Social and technical innovations may reinforce current unsustainable pathways. A key challenge is to use our innovative capacity to reconnect human development to the biosphere and support transformations toward global sustainability (Westley et al. 2011).



*A frequent common denominator social-ecological transformations is the shift from a management of single resources to broader integrated approach with humans considered an integrated part of ecosystems. For example, coral bleaching and crown-of-thorns starfish outbreaks in Australia triggered change agents to use a national election as a political window of opportunity to implement a new zoning legislation for the Great Barrier Reef. Agency officials prepared the system at the national level by approaching national politicians to support a rezoning of the Great Barrier Reef. Source: Olsson et al. 2008. Photo: A. Maslennikov/Azote*

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