Beyond techno-economic transitions: towards a conceptual framework to overcome path dependencies

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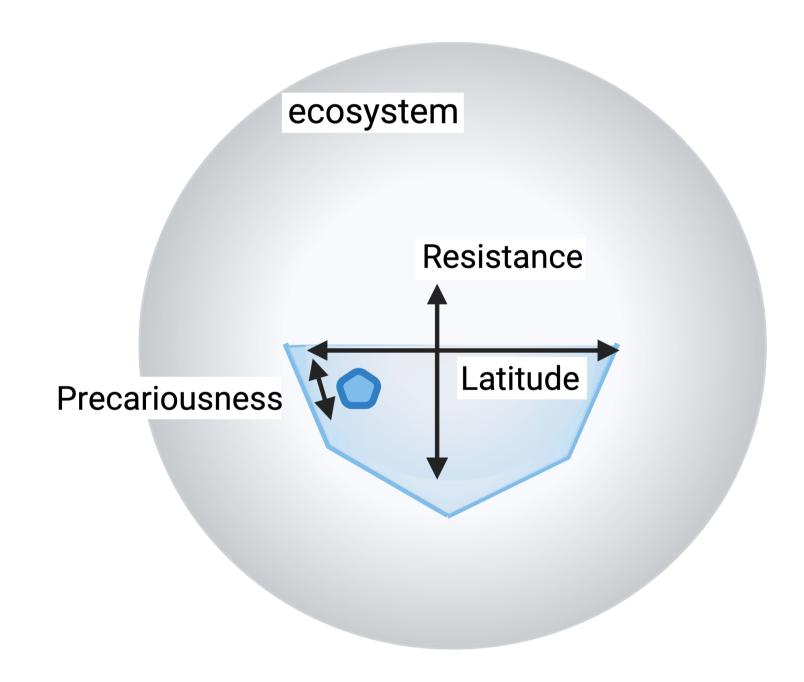Delft University of Technology, TPM Energy Transition Lab
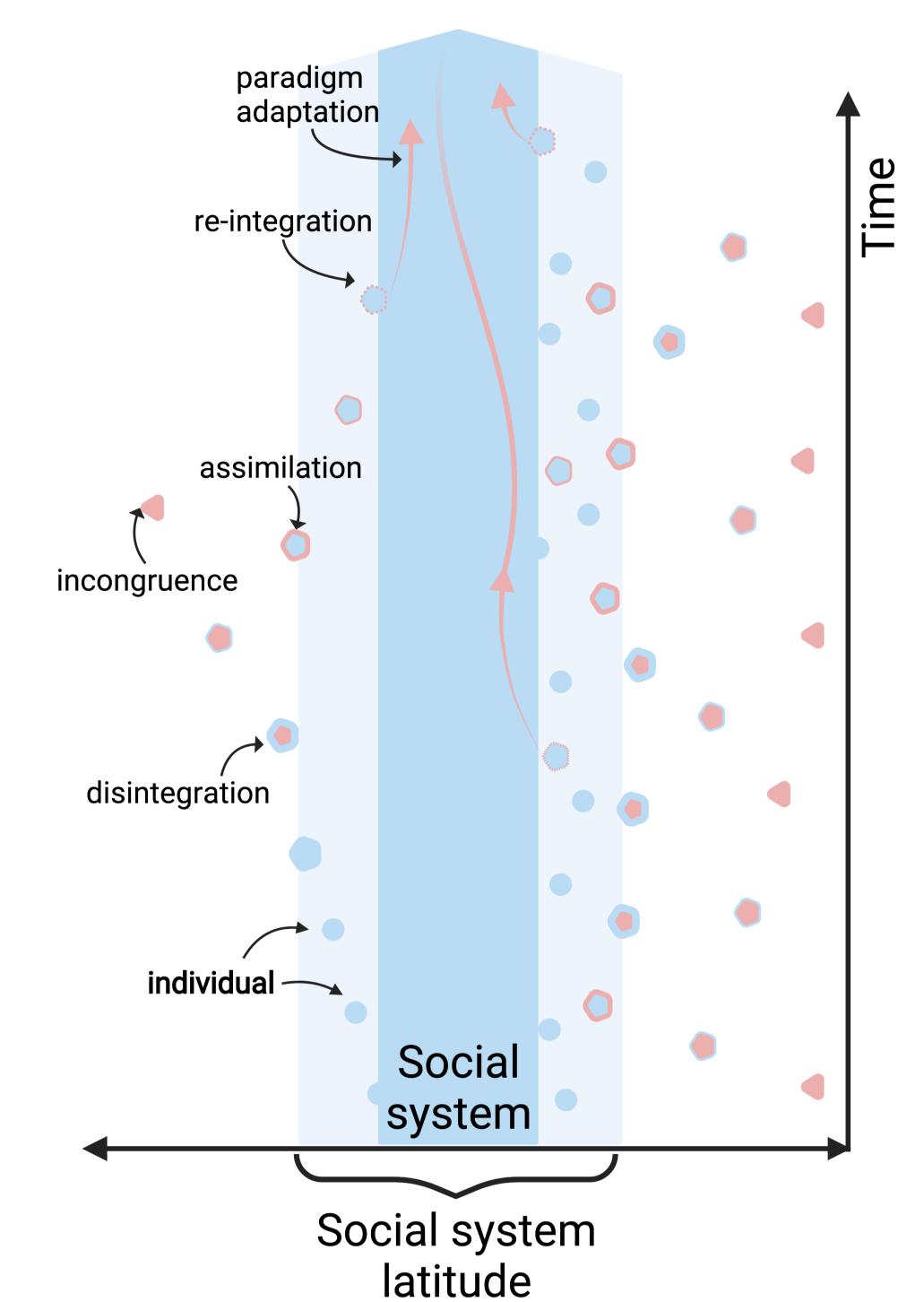
INTRODUCTION

The social system topography describes a specific system configuration, which is based on the system's guiding paradigm. Any social system is embedded within an ecosystem. Two forces determine the topography; external and internal forces. External forces are the ecosystem services. How these services are used is determined by the respective system's paradigm (internal force). The interplay between internal and external forces constitutes one part of system resilience.

RESILIENCE

The topography of the social system determines the system's resilience described by three system internal variables: Resistance, Precariousness and Latitude.
• Resistance: resistance to change
• Latitude: maximum change before reaching a tipping point
• Precariousness: closeness to a tipping point
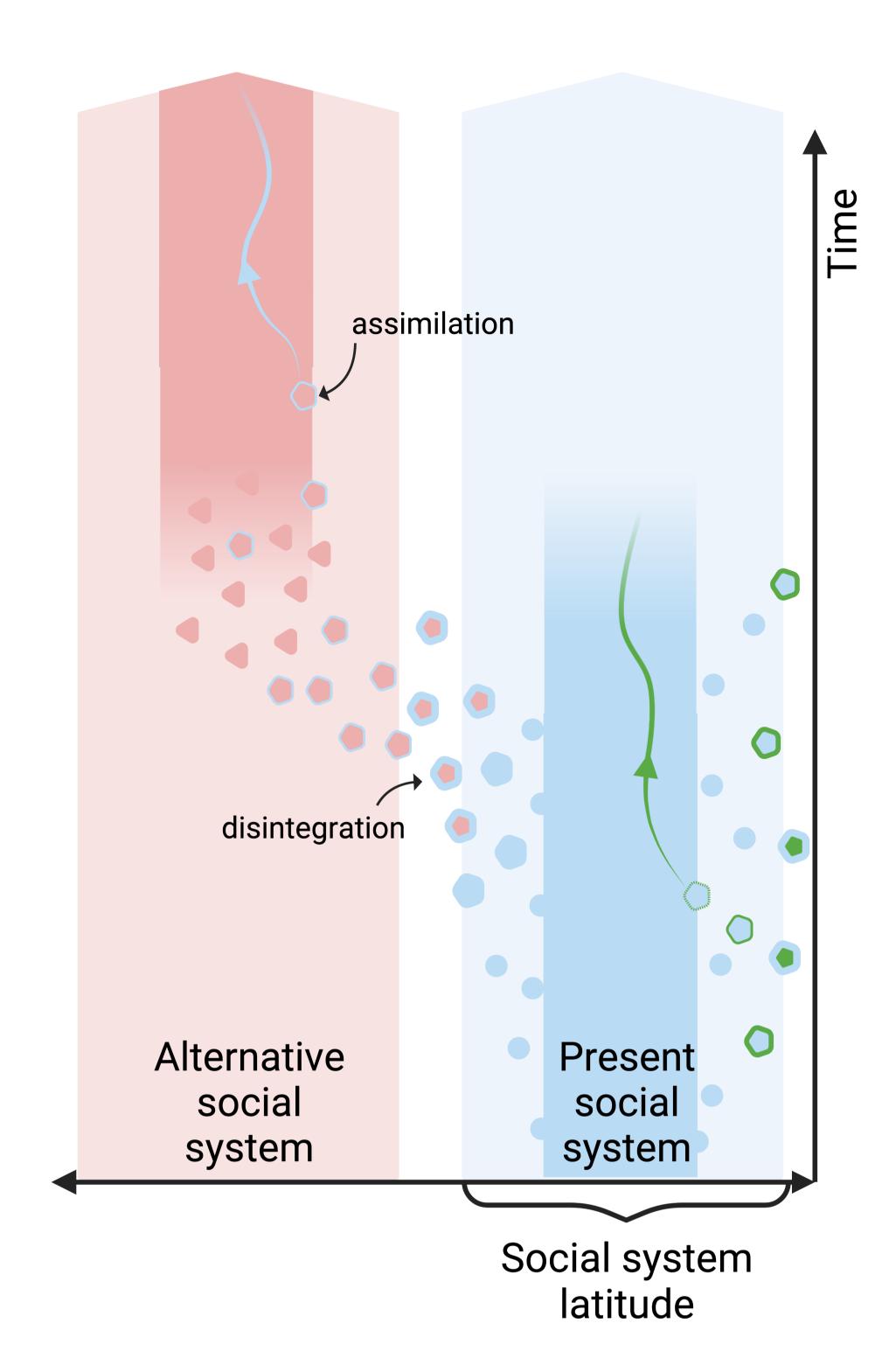(Walker et al. 2004)

PROCESSES

A social system collapse can be forced by external forces, if the interplay between internal and external forces led to a loss of e.g. ecosystem resilience. This process is not further discussed here.

System cohesion is achieved by the majority of individuals aligning with the system's paradigm. The paradigm determines the socio-technical, socio-economic, socio-institutional etc. system configurations.

Individual's alienation from the dominant paradigm is triggered by internal and external events, such as environmental degradation (e.g. internal forces destabilizing the ecosystem), or individual's dissatisfaction with the system (e.g. expectations not matching reality).

TRANSITION

The dot-like structures illustrate the possible change process of individuals. Changing of shape and color indicate a progressing disassociation of individuals from the mainstream. Though, the mainstream system can develop narratives that capture parts of the new paradigm to re-integrate individuals (e.g. green washing).

Only a paradigm shift leads to the creation of a new system. The notion of paradigms is borrowed from systems thinking and the leverage point concept (Meadows 1999). This concept has been applied to sustainability transition (Abson et al. 2017) and inner transformation (Woiwode et al. 2021).

Technological fixes without the adoption of a new system paradigm do not constitute a social system transition. Depending on the circumstances this can lead to mal adaption which leads to system collapse if not corrected (Gunderson & Holling 2002).

LEGEND

Paradigm conform

Paradigm alienation

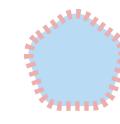Paradigm disintegration - new paradigm integration

Alternative paradigm - incongruent with "old" paradigm

Assimilation into "old" paradigm - unsuccessful paradigm shift

Re-integration into "old" paradigm - unsuccessful paradigm shift

3D TRANSITION MODEL

The seeds for a new paradigm are born in the respective currently existing social system and can be understood similar to the Gramscian concept of power struggle between the subaltern and the hegemon (Wanner 2015). The current system as the cradle for a potential new system is also suggested in socio-ecological literature and captured in the notion of adaptive systems (Gunderson & Holling 2002).

On the micro-level (niches) seeds of change are embedded within the main system for as long as no new system equilibrium has been reached. In contrast to other theories, a transition must not be a reintegration of niches into the mainstream. Therefore the transition is represented by a second social system topography that establishes through the majority of individuals disintegrating from the mainstream, forming a coalition to create a new system.

Abson, D. J., et al. (2017). Leverage points for sustainability transformation. Ambio 46(1): 30-39.
Gunderson, L. H. and C. S. Holling (2002). Panarchy: Understanding transformations in human and natural systems. Washington, Covelo, London, Island Press.
Meadows, D. (1999) Leverage Points: Places to Intervene in a System. Hartland
Walker, B., C. S. Holling, S. R. Carpenter, and A. Kinzig. 2004. Resilience, adaptability and transformability in social–ecological systems. Ecology and Society 9(2): 5.
Wanner, T. (2015). The New 'Passive Revolution' of the Green Economy and Growth Discourse: Maintaining the 'Sustainable Development' of Neoliberal Capitalism. New Political Economy 20(1): 21-41.
Woiwode, C., et al. (2021). Inner transformation to sustainability as a deep leverage point: fostering new avenues for change through dialogue and reflection. Sustainability Science.

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