

Understanding Resilience: From Theory to Practice

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Welcome to the conceptual zoo

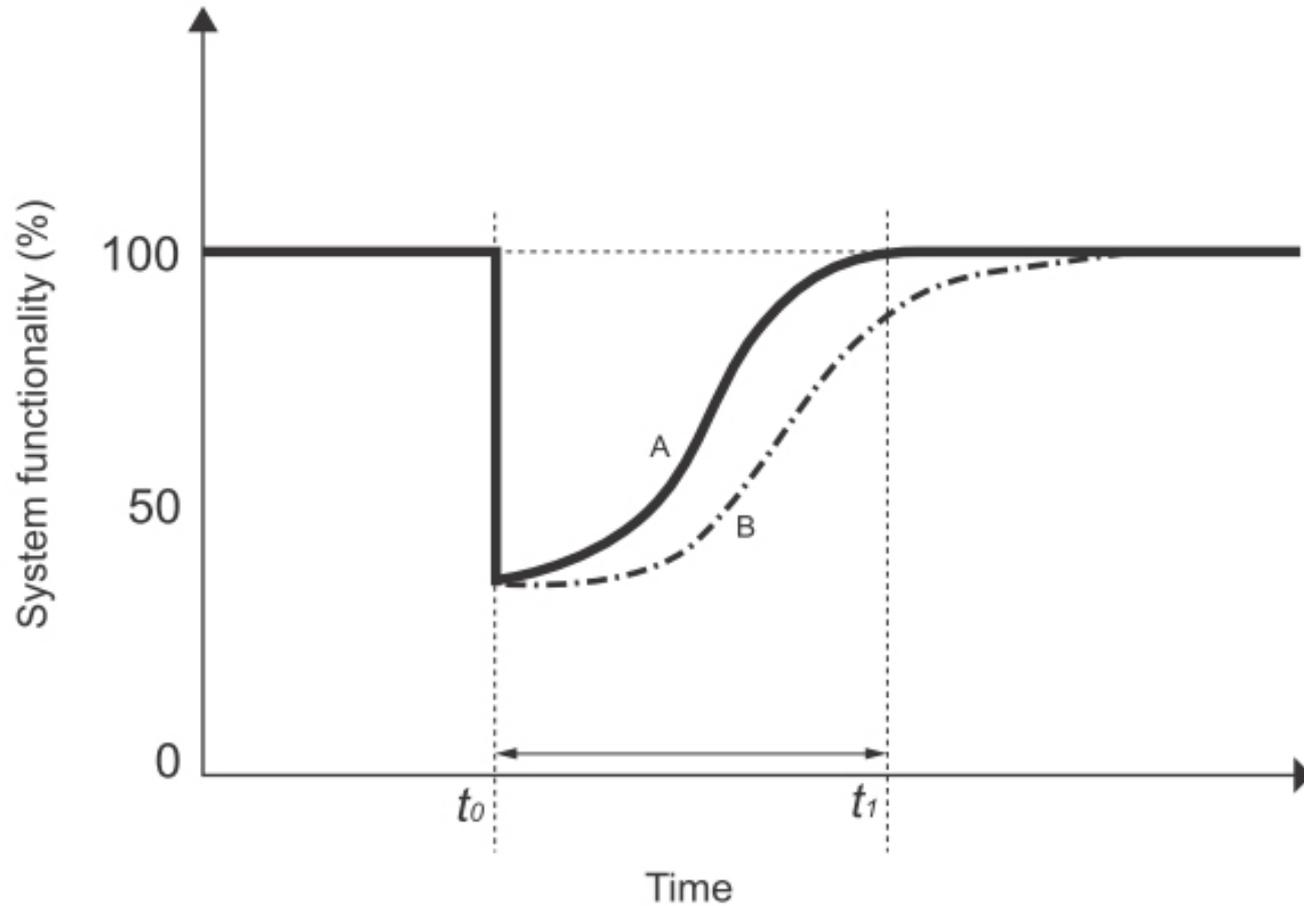


See recent reviews by MacKinnon & Derickson (2013), Tyler & Moench (2013), Cote & Nightingale (2012), Aven (2011), Turner (2010), Miller et al (2010), Moser (2008), Brand & Jax (2007), O'Brien et al. (2007), Adger (2006), Folke (2006), Gallopín (2006), Smit & Wandel (2006)

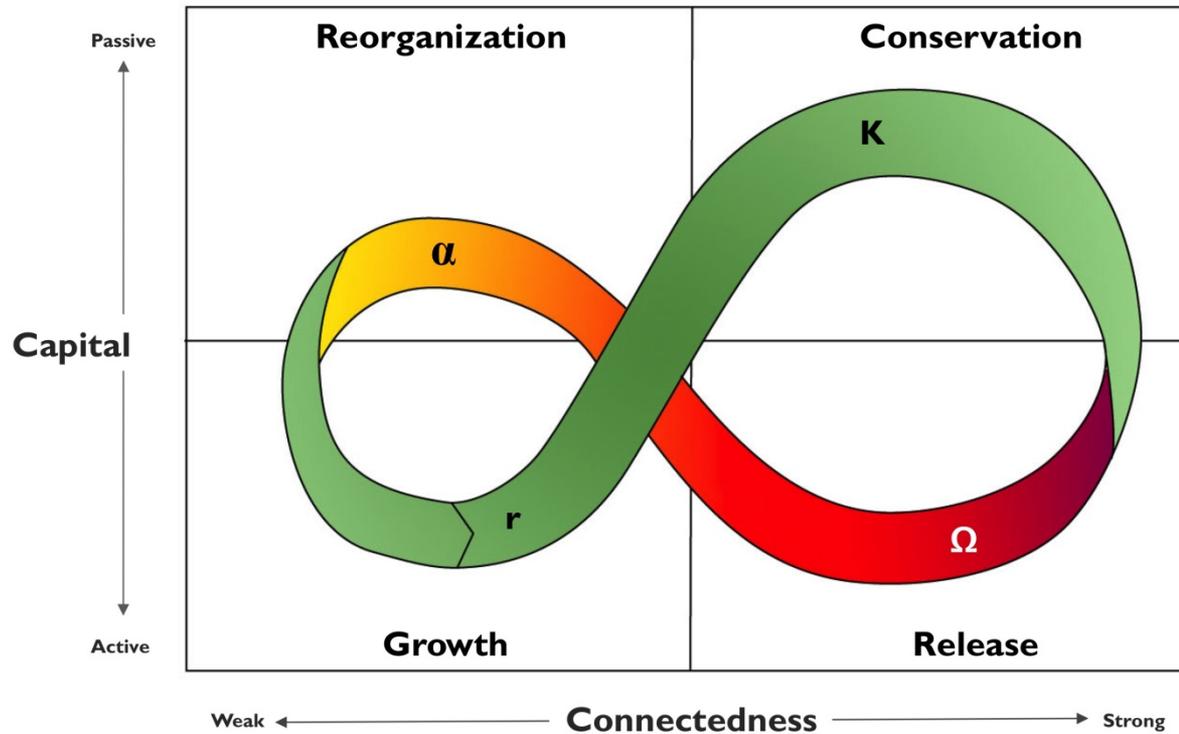
Typical (Common?) Understanding

- **Resilience** = the capacity to withstand change for some time but also, past a certain point, to transform while continuing or regaining the ability to provide essential functions, services, amenities, or qualities.
- **Constituent processes:** persistence, absorption, recovery, renewal, learning, coping, adapting, transformation, and vulnerability
- **External demands and internal stresses on systems:** risks, shocks, hazardous events, disturbances, gradual changes, and chronic stresses
- **Key capacities:** self-organize, learn, adapt

Deep roots in math and engineering

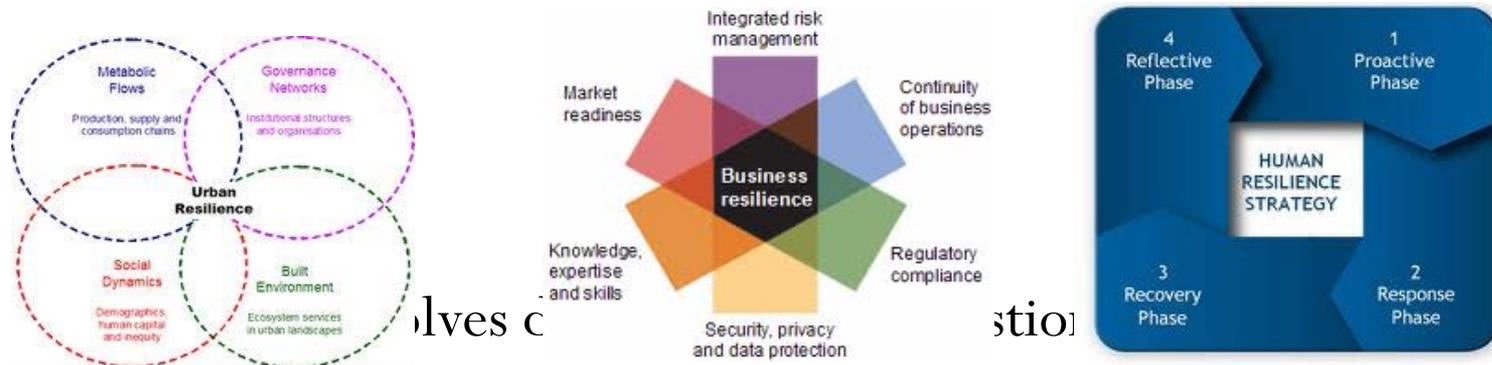


Deep roots in ecology



Social science views on resilience

- Conceptual consensus in the social sciences is not in sight
- Often, (uncritical) adoption of “ecological resilience”
- Legitimate challenges to some of resilience theory’s assertions
- Specific varieties (social, economic, business/ financial, disaster, psychological ...)



- Resilience is deeply conservative

Elements of Urban Resilience



Source: A Surjan (2011) Understanding Urban Resilience, in: *Community, Environment and Disaster Risk Management*. Emerald.

Community Resilience Score

Figure 38-2. Sample radar plot showing Community Resilience Self Assessment (CRSA) scores for Superior, MT (sampled in 2009–2010).

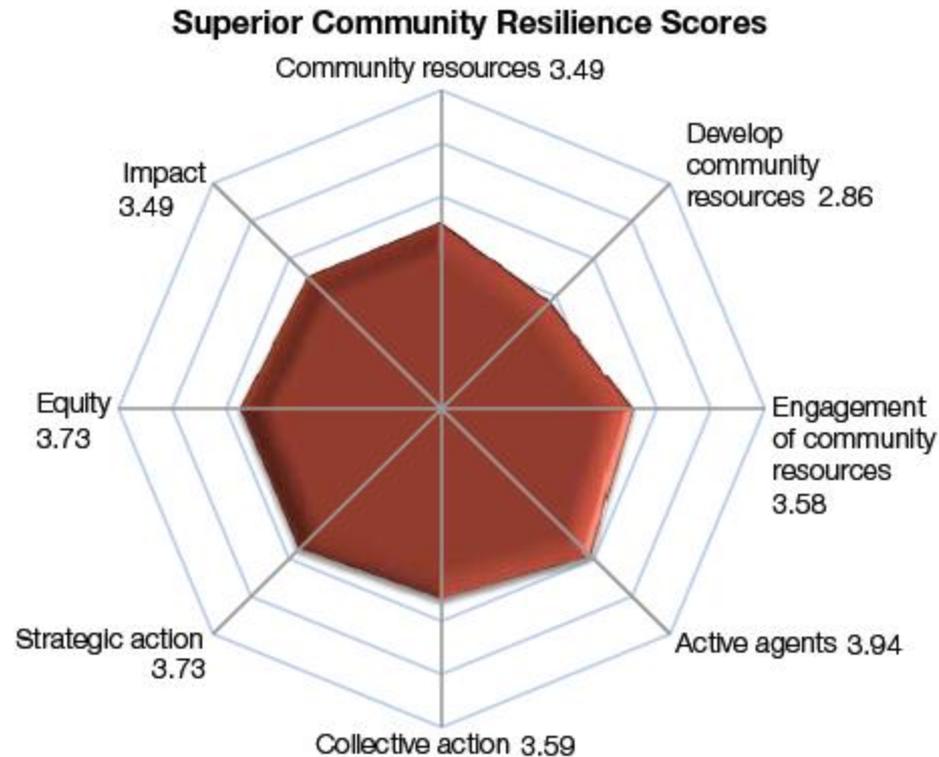


Figure shows CRSA Index scores (1 = lowest, 6 = highest)

Source: US Forest Service

Resilience depends on relationships in space and time

- Social systems' relationship to ecological systems
- What is the boundary of the system at risk of change?
- Temporal considerations
- Parallel distinctions between specific and general resilience and specific and general vulnerability
- Resilience as an inherent trait of systems vs. an emergent property between a system, its context, the forces that act on both?



Implicit Trade-offs of Different Approaches

Approach Criteria	Adaptation	Vulnerability	Resilience
Stressors	Single stressor	Multiple stressors	Multiple variables
Spatial scale of implementation	Sector focus	Focus on places, communities, groups	Large-scale coupled social-natural systems
Temporal emphasis of implementation	Short- & medium term future	Past and present	Long-term future
Actors	Public-priv. partner-ships, technology focus	Public sectors, civic groups; human agency	Civil society, public sector; agency weak
Policy goal	Address known and evolving risks	Protect group most likely to exp. harm	Enhance overall capacity for recovery, renewal
Desired outcome	Max. risk and loss reduction at lowest cost	Minimize social inequity, maximize opportunities	Minimize chance of rapid, large-scale, irreversible collapse
Experience/ implementation	Emerging, some responses well established	Well established	Emerging

This Raises More Critical Questions

- **Resilience:**

- Are you willing to face the political pressure to live with “smaller” hazardous events in order to safe-guard long-term resilience and sustainability of social-ecological systems?



Photos (t-b): flickr, ens

- **Vulnerability:**

- What is an acceptable level of vulnerability?
- Are you willing to work (or: fight) for the poorest, most disadvantaged communities against the most powerful forces?



- **Adaptation:**

- Are you willing to face the consequences of educating people about the trends, challenges and growing risks they are facing?

Criticality – Resilience

- Criticality
 - In DRR: Lifelines > Critical priorities
 - In GEC:
 - Level of extreme vulnerability
 - Decay of social-economic conditions
 - extreme degradation of environmental conditions
 - Growing disconnect between rapidly degrading conditions and delay in societal response (> viscous cycle, growing demand on other regions to absorb refugees, compensate lost assets, provide assistance)
- “Environmental criticality” – closest to an antonym of social-ecological resilience
- Societal responses to criticality: maladaptation – inadequate response – stabilization – repair and recovery
- Criticality sheds light on temporal and spatial dimensions of vulnerability and of resilience
- Criticality sheds light on the social dynamics that lead to continued degradation



The fate of two concepts

Sustainability

- *broad appeal* in different disciplines but is a hotly contested concept
- can reflect the state of affairs, a political intent, or a set of values
- explicitly *long-term and multi-generational, emphasizing stability and persistence* through time;
- Sometimes a process (a 'journey') or an outcome (a 'destination');
- applied to a *wide range of units of analysis*;
- *multi-dimensional*
- *essential versus dispensable aspects* of sustainability are widely debated;
- to operationalize, measure, and track it, *requires a clearly defined spatial scale and time horizon*;
- is *context specific*;
- most commonly a *normative concept*, and frequently *anthropocentric* in focus
- Remains an *elusive* concept.

Resilience

- *broad appeal*, but not universally accepted, understood or appreciated
- is a *multi-dimensional* concept
- strong recognition of *dynamic* systems by and interacting with dynamic and evolving environments
- reflects *shift in management perspectives* from control of static situations to adaptive management
- used in *normative, prescriptive sense* or in merely *descriptive sense*
- a *characteristic of complex systems* leading to desirable/undesirable outcomes, as a *means to a desirable end*, or as a *desirable outcome*
- *studied at various scales*, yet recognizes variability across space and time and considers cross-scale interaction
- remains an *elusive* concept, whose list of ingredients is long, but for which *predictability remains shrouded*.

In Practice?



Resilience

The Courage to Come Back

CARRI's Community Resilience System

- Communities typically want 4 things:
 - An understanding of *what resilience means* for their community
 - A practical way to *measure their resilience* and understand how to improve
 - Simple, usable *processes and tools* that will help them move forward; and
 - *Tangible benefits* that flow from their efforts

- > an action-oriented, web-enabled process to assess, measure, and improve community resilience to a variety for threats and disruptions

CARRI definition

- A resilient community is one that
 - (1) anticipates shocks and hazards,
 - (2) reduces vulnerability and impacts as much as possible,
 - (3) responds effectively, efficiently, and equitably to emergencies, and
 - (4) recovers rapidly and more fairly after the event to make the community safer all around.



See: <http://www.resilientus.org/>

Resilience – The New Sustainability?



In the face of unpleasant
change...



...keeping what we've got

The Upshot: Implications for Adaptation Research & Practice

- Much greater attention needed to:
 - Normative implications
 - Cumulative and interactive changes (even if not “extreme”)
 - Spatial relationships in the face of widespread change
 - Resilience now vs. resilience over time > different capacities?
 - Social/institutional traps that slowly lead to criticality
 - Qualities that help us realize our “capacities” (and the barriers that prevent it)
 - Capacities for *rapid* adaptive response (e.g. abrupt change)
 - Interactions between coping, adaptive, transformative capacities
 - Human-system tipping points (pos./neg.)
 - Outcomes of our interventions
 - The individuals that make it happen



Thank you!

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