

# Exploring a Methodological Framework for Understanding Adaptive Change in Cities

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## Abstract

Resilience is about change and how systems respond to change. To understand resilience it is therefore important to understand how cities respond to change. Cities can be described as social ecological systems that react to change and perturbations through responses at various spatial and temporal scales. In the study of resilience of ecosystems, this is described through the concept of panarchy and the metaphor of the adaptive cycle. The adaptive cycle is used widely as a key metaphor to describe resilience. Central to this metaphor is the idea that systems undergo periodic cycles of change without fundamentally changing functional identity, remaining within a particular basin of attraction. However, these changes can cause the system to tip into another basin of attraction, with a different functional identity.

In the field of ecosystems, these different states are well described and the characteristics indicating a change in identity are well defined. However, in the study of urban social ecological systems, this is still a mainly unexplored topic and the methodologies for identifying and mapping different urban system states and phases within the adaptive cycle, let alone the application of the adaptive cycle concept requires further thought.

This paper explores a methodological framework for describing the movement of cities or neighbourhoods through the various phases of the adaptive cycle and possibly, different system states. This method is illustrated using the example of two neighbourhoods in South Africa and the changes they experienced over a period of approximately one hundred years.

**Keywords:** Resilience, Panarchy, adaptive cycle, urban systems.