

APPLYING THE THEORETICAL FRAMEWORK OF ECOLOGICAL RESILIENCE TO THE PROMOTION OF SUSTAINABILITY IN THE URBAN SOCIAL-ECOLOGICAL SYSTEM

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ABSTRACT

The current polycrisis of climate change, peak oil and economic uncertainty, combined with a series of significant natural disasters that struck urban areas from the USA to Japan, prompted global interest in the resilience of cities as contributing factor to their sustainability. Resilience is a concept commonly found in psychology, engineering and ecology. Applying resilience thinking to urban systems is, however, a fairly new field of inquiry. To date, most research on urban resilience is grounded in psychological and engineering interpretations of resilience. However, an increasing appreciation of the city as a social-ecological system motivates for an ecological resilience approach to the development of sustainability strategies.

This paper is a philosophical inquiry into the use of the theoretical framework that underpins ecological resilience in an urban context. As a starting point the current ecological resilience framework is discussed and three key aspects of resilience theory identified. These are the idea of multiple stability regimes, the adaptive cycle and the importance of diversity to adaptive capacity, and the notion of the multi-scale system of interactions referred to as the panarchy. In applying the resilience framework to cities a number of questions arise. The paper conceptually explores two of these: what would be the different stability regimes and systems states within these regimes in a city, and how should one understand the concept of diversity.

It is proposed that a typology of system regimes can be built around the form and structure of the city, the degrees of formality, or institutional factors such as political administration or ideology. Most likely a typology of system regimes would include a mixture of such variables to define the functional identity of each type of regime. Questions around the kinds of variables that would describe these regimes and their thresholds, as well as the disturbances that can push them closer to or further from a threshold are also discussed. In discussing diversity, six different urban functional categories were identified by looking at the users of space and resources. It is proposed that building up a range of responses in each of these functional groups at different scales of the city and distributing them evenly through the city, increases the resilience of the city.

The paper attempts to take the discussion outside of the purely ecosystem services focus, to look at the city as a social-ecological system with disturbances, functions and sources of diversity that sits in the social aspects of the city, whether these are in terms of the functional requirements or the ideological pressures brought to bear on the system. The exploration presented is at this moment purely speculative, but will be used to guide further empirical research under a project funded by the National Research Foundation. However, there is no doubt about the need for conceptual clarification of resilience thinking if it is to be a useful method for engaging with change and sustainability within cities. Simply stating principles of resilience derived from an ecosystems perspective without such critical engagement about what these principles mean for the urban social-ecological system as a whole would ultimately result in another meaningless and over-exploited framework that do not bring us closer to creating and managing cities that can cope with the challenges of the future.

Keywords: resilience, adaptive capacity, cities, urban sustainability, complexity