Chapter 1
A Paradigm Shift towards Urban Resilience

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ABSTRACT

The global environmental situation is in decline, and cities are at the very centre of the problem. This has resulted in an urgent need for a radical and large-scale eco-technological overhaul. This chapter focuses on the paradigm shift towards sustainability and resilience, and particularly, how the new thinking of resilience can convert investments in urban infrastructure and development into resilient support systems, enabling both greater city prosperity and environmental regeneration. The objectives of this chapter are to search for new paths in the creation of resilient communities through the sustainable use of technologies; to discuss the significance of equity, economy, and traditional knowledge in resilient cities; to put forward a green approach that encompasses both mitigation and adaptation; and to explore potential and practical ways of creating urban resilience. A detailed review of existing definitions and policies related to urban resilience, as well as the role of eco-technologies and city planners in this process, is also presented. The chapter concludes by suggesting a set of urban design strategies and a list of key stakeholders as critical ingredients in the move towards urban resilience.

INTRODUCTION

Cities become generators of new risks under the threats of peak oil, climate change, earthquakes, hurricanes and floods, etc.; while failing infrastructure and services, environmental urban degrada-tion and increasing informal settlements raise the vulnerability of their inhabitants. The melting of ice sheets (e.g. Greenland and West Antarctic), hurricanes (e.g. Katrina and New Orleans), tsunamis and floods (e.g. Seychelles and Pakistan), earthquakes (e.g. Istanbul, Tehran, Mumbai) and the peak oil problem since 2006 have challenged

the status quo of city living, and have resulted in serious economic, social and environmental disruption.

The United Nations International Strategy for Disaster Reduction launched a new campaign in 2010 entitled "Making Cities Resilient," with the vision of creating resilient and sustainable urban communities. The campaign invites local governments to make their cities as resilient as possible under the slogan of "My City is Getting Ready". The intention is to convince authorities to commit to a checklist and to work with local networks in the project, which is linked to UN-HABITAT's World Urban Campaign on Sustainable Urbanization, and follows strategies that are similar to the Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters (UNISDR, 2010).

Central to this paper is the concept of resilience, which refers to the ability of a system, from the individual to whole economies, to hold together and maintain their ability to function in the face of change and shocks from the outside. "From oil dependency to local resilience, the move towards more localized energy efficient and productive living arrangements is not a choice; it is an inevitable direction for humanity" (Hopkins, 2008, p. 17). Rebuilding local architecture and food production, localizing energy production, rediscovering local building materials in the context of eco-tech building, rethinking how waste is managed – all of these can provide resilience and offer the potential of an extraordinary new beginning in economic, social and ecological terms.

This chapter aims to foster a better understanding of the consequences of climate change, peak oil and natural hazards, and defines how their consequences may contribute to urban vulnerabilities. Suggestions are made regarding what should be done by stakeholders to actively promote learning and capacity building on the path to the creation of sustainable and resilient communities. The intention is also to build awareness on resilience in urban planning and design by presenting some indicators and strategies; and new methods are sought for the creation of resilient communities through the use of sustainable technologies. The significance of equity, economy and traditional knowledge in cities is discussed, as well as a green approach to mitigation and adaptation, with suggestions of some potential and practical ways of creating urban resilience. A detailed review of existing definitions and policies related to urban resilience is provided, along with a definition of available eco-technologies and the role of the city planner. Many studies have been made into the latest approaches to urban resilience to determine a set of key strategies.

The research questions raised in this chapter, not listed in order of priority, but in the order in which they are addressed, are:

- What are the key threats to cities of different scales?
- What is a resilient city? Is there an optimal density and layout for cities?
- How can we measure urban resilience? What are the indicators?
- How does urban form influence resilience at different scales?
- How does social and spatial inequity influence resilience?
- What roles do social capital and traditional knowledge play in urban planning, governance and sustainability?
- What are the roles of planning and design professionals in finding new paradigms and models for more resilient cities?
- What technological tools are available to assist planners and communities when designing for resilience?
- What role should local government play in a resilient city?
- What kinds of strategies need to be adopted in city planning and design to address the challenges of climate change, peak oil and natural disasters?

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