

# Chapter 7

## Green Resilience Eco-Oriented Land Uses in Urban Socio-Ecosystems

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### ABSTRACT

*This chapter is aimed to analyze the system of green resilience eco-urban land uses oriented in urban social-ecological systems. It reviews and analyses the relevant literature in green social-ecosystem resilience concept and present a discussion in relation to the sustainable development and ecological sustainability. It further discusses and gives an in-depth overview of the urban social ecosystems as a working structural and functional unit, describes decision support tools that could be applied to sustainable green land uses and development, and offers some strategies for engaging in urban ecosystems, ecological sustainability and adaptive development. It is concluded that the urban land use that through the innovative pro-environmental solutions can, in a natural way, support the system of green resilience eco-oriented urban land uses in urban eco-systems and serve to improve the quality of life in the city.*

### 1. INTRODUCTION

Human development has had a profound imprint on nature and coevolving ecosystems which had resulted in complex, economic-socio-ecological challenges for sustainability and future development. Sustainability is a set of goals combining social equity, economic viability and ecological integrity (Curwell, Deakin, & Symes, 2005; Jenks & Jones, 2010). Humankind alters the dynamics of the ecosystem through anthropologic activities that change the atmosphere, climate, land surface, forest, sea, and waters. Humankind another organism's survival is dependent on healthy and resilient social-ecological systems and sustainable environments.

Human wellbeing, economic growth and social development are dependent on the interrelationships between and within the regions and environmental sustainability (Arrow et al., 1995; Folke et al.,

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1998). Uncertainty, diversity and variability of social-ecosystem increase their inevitability reducing their capacity to cope with disturbance and change within functional groups in the adaptive capacity of ecosystems (Folke et al. 2002; Jackson et al. 2001; Scheffer et al. 2001).

Cities have been portrayed as predominantly monumental static architectural structures of increasing ecological complexity that change over the long term. Contextual and conceptual factors of urban change can be assembled into a framework of ecological urban design. Disturbances change the resilient capacity of nature to supply ecosystem services, degrading socioecological systems and leading to social and economic vulnerability. Inhabitants of urban areas pose a high impact on the ecosystem services with trade and consumption, claiming support in waste absorption, carbon emissions, residential water use, wood for industrial purposes (Folke et al., 1997, Grimm et al., 2008). Adverse human impacts on the social-ecosystem and the biosphere can be minimized through the use of resilient and sustainable environmental approaches such as environmental resources management, conservation biology, environmental and ecological economics, bioeconomics, green technology, etc.

According to Levin (1999), fragility is inherent to the ecosystem services on which human's dependent and not nature. Global health control of the ecosystems, published in 2005 by The United Nations Millennium Ecosystem Assessment (MA) observed that technological advancement is the main cause of the Earth's ecosystem services degradation and is used unsustainably. The growing eco-deterioration is an impediment to combating poverty (Millennium Ecosystem Assessment (MA), 2005). If the ecosystem and natural resources are controlled by few people, they do for short-term economic gain.

Sustainability is the capacity of a system or process to be preserved, enhanced, upheld or maintained. Sustainability is the capacity of biological systems and processes to endure disturbances and remain vigorously diverse. Sustainability is a systematic combination of environmental science and sustainable development (Lynn et al., 2014).

Sustainability has the core value the sustainable development comprised of the interconnection of ecology, culture, politics, and economics domains (James, et al., 2015). Ecology refers to the paradigm, knowledge, methods and procedures of contemporary ecological science (Kolasa & Pickett, 2005). Ecology is a multidimensional and complex concept that requires an interdisciplinary framework of analysis for its application in urban spaces (Pickett & Cadenasso, 2002). The dimensions of ecology are the notion, the models and the metaphors used to communicate assumptions, values and experiences (Cadenasso et al., 2006a)

Sustainability is a social challenge that has an impact on economic efficiency, production, distribution, urbanization, transportation, lifestyles and ethical consumerism. Promoting sustainable and resilient lifestyles in sustainable urban social-ecosystems to conserve ecological resources, range from among other activities from green spaces, sustainable architecture, green housing and building, ecovillages, green business and green economic sectors, sustainable urban agriculture and farming, green technologies, renewable energies and designing reversible and flexible systems (Zhang and Babovic, 2012). The specific types of sustainability are sustainable architecture or ecological economics, sustainable technology, and agriculture (Costanza and Patten, 1995).

Sustainability includes concerns on global climate change, ozone depletion, biodiversity, wildlife conservation, deforestation, genetically engineering, urbanizations, etc. The sustainable environmental and ecological system is being identified in the resilient social ecosystems with the capacity that has to continue functioning despite facing natural and anthropogenic disturbances, but anticipating and preparing ahead for them.

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