Chapter 48
Environmental, Social, and Economic Indicators of Urban Land Use Conflicts:
Evidence From Istanbul Metropolitan Area

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ABSTRACT

Due to the recent increase in population, urbanization in developing countries progressed to the outer fringes of the city and resulted in ecological and social problems. Especially land use conflicts resulting in such phenomena are characterized by pressures on the environment caused by ever-increasing anthropogenic factors subject to unplanned settlement, notably in heavily populated metropolitan areas. Despite the fact that Turkey is one of the countries, which this conflict intensively occurred. Studies on compliance of land use in Turkey with the zoning plans mainly consider socioeconomic indicators. This, in return, raises concerns over applicability and the rationality of the plans created. Three main indicators: environmental indicators, social indicators and economic indicators were selected and then estimated to retrieve the relative weights of the indicators was determined using Analytic Hierarchy Process (AHP) pairwise comparison method. Weighted linear combination (WLC) was carried out in the study.

INTRODUCTION

Istanbul is the largest city in Turkey and the heart of the country. It is also one of the largest agglomerations in Europe and the fifth largest city in the world in terms of population within city limits. Istanbul is one of the 23 megacities (metropolitan areas with a population of more than 10 million) in the world and one of the most rapidly growing cities in Europe (Van Leeuwen&Sjerps, 2016; Alptekin et al., 2016). The fast spatial development process of Istanbul Metropolitan Area brings together a rapid change not

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only ecologic but also social, cultural, economic and administrative structures in the outer fringes of the city as well as the entire urban area, and problems that have impacts on the society. In Istanbul Metropolitan Area, which is predominantly under the effect of economic activities, the ecologic dimension of sustainability is either deemed to be of secondary importance or merely overlooked in the planning studies. As a result, a balance of the natural habitat is damaged and bearing capacities are exceeded on the entire urban region. Studies on the compliance of land use in Turkey with the zoning plans mainly consider socioeconomic indicators (Tanrıvermiş 2003; Alphan 2003; Başkent & Kadioğullari 2007). In this context, it is imperative to reveal, analyze and evaluate multiple casual relations and interactions of parameters in Istanbul Metropolitan Area. In the scope of this study, these parameters have been considered as environmental, social and economic indicators.

BACKGROUND

Since the urban environment is characterized by deep complexity, indicators are handy and useful expression to evaluate environmental data. In generally, Environmental Protection Agency (EPA) and European Environment Agency (EEA), indicator definitions are preferred to environmental studies. EPA has defined environmental indicators describing the characteristics of the physical environment and evaluating the form of numeric values (EPA 2011). In addition, indicators are defined as the evaluation of the effects according to the parameters due to anthropogenic effects occurring in the environment and ecosystem by EEA. (EEA 2010).

As it is evident from the definitions, indicators compare references or normal values taking into account their correlation with the resilience of nature (Cabell & Oelofse 2012; Passeri et al. 2013) and environment and reveal a simplified version of reality (EEA 2010). In the context of anthropogenic pressures created on environment and urban ecosystem in the intensive urbanization process, environmental and socio economic indicators help to evaluate environmental effects (Dale & Beyeler, 2001; Kasanko et al. 2006) to compare various scenarios suggested by such environmental effects (White et al. 2000; Barredo et al. 2003; Barredo et al. 2004; Petrov et al. 2011), to share the findings with the public (Banville et al. 1998; Munda 2004; Li et al. 2009; Jaeger et al. 2010), and to contribute to decision-making processes (De Marchi et al. 2000).

Land use change has primary importance among sources of environmental conflict. (White et al. 1997; Sleeter et al. 2012). Spatial distributions of land use conflicts has revealed a sign in recent years in the developing countries which has uncontrolled urban development (Farrow & Winograd 2001; Patroescu et al. 2009). Indicators of land use changes in built-up and urban fringes have varied over time (i.e., cost-benefit analysis or MCA) and international institutions have created set of indicators for examining of environmental and ecological features (EEA, 2005; EPA, 2011) or the sustainability and socio-economic indicators of the OECD (OECD 1997a; OECD 1997b).

For such evaluations, the indicators and the big spatial data that offers geographical expression to the ecological, social, cultural, and economic features of society require use of MCA that offers to decision-makers in discovering and solving various and complicated problems in many fields (Jeong et al. 2013).

The MCA represents decision-making analysis (Keeney & Raiffa 1976) that is able to numerical asses alternatives (Linkov & Moberg, 2011; Barfod et al., 2011; Convertino et al., 2013). Several studies (Jeong et al. 2013; Koschke et al., 2012; Convertino et al., 2013; Wood et al, 2012) have implemented