

Developing Cause-effect Model of Urban Resilience versus Flood in Karaj City using TOPSIS and Shannon Entropy Techniques

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Abstract : The history of urban development and the increasing complexities of urban life have long been intertwined with different natural and man-made disasters. Sometimes, these unpleasant events have destroyed the cities forever. The growth of the urban population and the increase of social and economic resources in the cities increased the importance of developing a holistic approach to dealing with unknown urban disasters. As a result, the interest in resilience has increased in most of the scientific fields, and the urban planning literature has been enriched with the studies of the social, economic, infrastructural, and physical abilities of the cities. In this regard, different conceptual frameworks and patterns have been developed focusing on dimensions of resilience and different kinds of disasters. As the most frequent and likely natural disaster in Iran is flooding, the present study aims to develop a cause-effect model of urban resilience against flood in Karaj City. In this theoretical study, desk research and documentary studies were used to find the elements and dimensions of urban resilience. In this regard, 6 dimensions and 32 elements were found for urban resilience and a questionnaire was made by considering the requirements of TOPSIS techniques (pairwise comparison). The sample of the research consisted of 10 participants who were faculty members, academicians, board members of research centers, managers of the Ministry of Road and Urban Development, board members of New Towns Development Company, experts, and practitioners of consulting companies who had scientific and research backgrounds. The gathered data in this survey were analyzed using TOPSIS and Shannon Entropy techniques. The results show that Infrastructure/Physical, Social, Organizational/ Institutional, Structural/Physical, Economic, and Environmental dimensions are the most effective factors in urban resilience against floods in Karaj, respectively. Finally, a comprehensive model and a systematic framework of factors that affect the urban resilience of Karaj against floods was developed. This cause - effect model shows how different factors are related and influence each other, based on their connected structure and preferences.

Keywords : urban resilience, TOPSIS, Shannon entropy, cause-effect model of resilience, flood

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