

SPATIAL ANALYSIS OF SOCIO-ECONOMIC VULNERABILITY OF BOJNORD CITY TO EARTHQUAKES USING SPATIAL MULTI-CRITERIA MODEL IN GIS

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A review on theoretical bases of vulnerability shows that from 1970s on, the research on “vulnerability” and “disaster” pays attention to the reasons and explanation of socio-spatial differences of the vulnerability. They haven’t contained themselves with natural forces, damages estimate and emergency response (Smith, 2000; ECHO, 1999). However, the conducted researches in Iran merely focus on either physical-technical aspect or on different influences and consequences of hazard happenings. In fact, concentration on “hazard Intensity and resulted disaster” and also prevalence of “loss ideas and physical solution” is the feature of most vulnerability measurement and analysis of earthquake in Iran (Ghadiry and Eftekhari, 2013; Ghadiry, 2008).

In order to reduce the vulnerability of cities to earthquake, It is essential to be evaluated the social dimensions of vulnerability and its spatial distribution. Therefore, the main question of this research offered as: How is spatial distribution of social vulnerability in Bojnord city? Then, by study of the theoretical and research background, research hypothesis was presented: the social vulnerability of Bojnord city has spatial differences.

Relate to the nature of hypotheses and its variables, the descriptive analytical methodology was used to test the hypotheses. According to the indicators, the needed data were gathered by library method. The concept of social vulnerability operationalized at 4 dimensions and 21 indicators and then measured by AHP model. So, at first, each indicator prepared by ArcGIS functions such as spatial analyst, buffering and raster classify. Then, the weight of all indicators was prepared by AHP model. Finally indicators combined by weighted overlay in ArcGIS.

The results showed that the socio-economic vulnerability has spatial differences and the greatest vulnerabilities are in the corners of north-east and south-west of the city (Figure 1). Thus, the hypothesis confirmed.

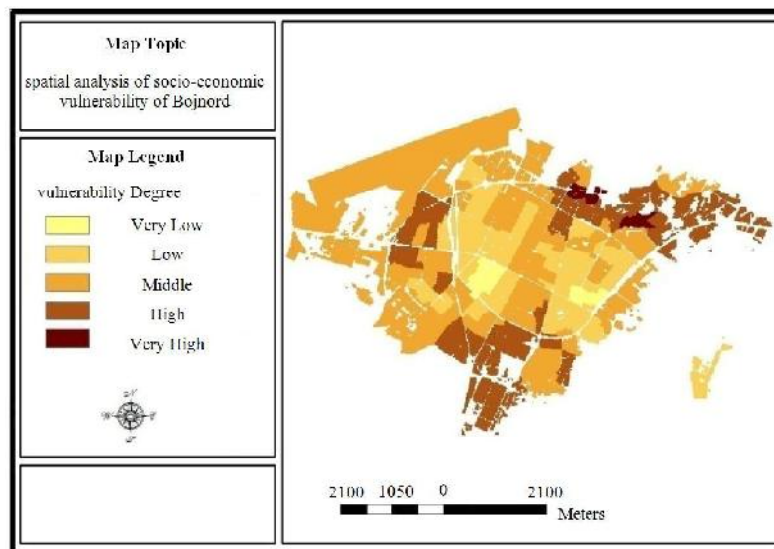


Figure 1. Composite map of spatial analysis of socio-economic vulnerability of Bojnord

The Research findings reveal that the vulnerability of households is higher in areas of residence with lower socioeconomic status. The results show the vulnerability of households with lower socio-economic status are more, so that households with lower occupational status, education, and income and social status had higher vulnerability. This indicates that the reduction of vulnerability to a large extent dependent on the employment and income situation of households and somewhat dependent on the knowledge and attitudes of households. The results show that households with low social status live in worse neighbourhoods. Vulnerability at society scale, including urban society, has socio- economical aspect, in addition to bio-physical aspect. So, ignoring socio-economical vulnerability aspects and status, and mere concentration on hazards and their effects can ruin vulnerability reduction policies due to ignoring, at least, the half of the reality.

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