

The Assessment of Urban Social Vulnerability to Earthquake (A case study: Zanjan city)

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1- Introduction

The worldwide studies show that the vulnerability of different groups of people living in risk prone areas is different in parts of the world depending on the level of life and social and economic conditions. So vulnerability is not only the result of being prone to risk rather the result of social, economic and political processes and accident is the final situation resulting from these processes. Considering the vulnerability approaches and theories, people are not vulnerable only due to their proximity to risky areas, but also their social and economic conditions cause increase and decrease in their vulnerability. Poor and low income people in urban areas live in houses with materials of low durability against earthquake and weak or vulnerable areas such as informal settlement areas, rivers boundaries, power transmission lines and slope regions, that in case of natural disasters such as earthquake have very high vulnerability compared with other urban dwellers.

According to the importance of assessment of vulnerability of cities to earthquake, the social dimension of vulnerability should be assessed, because without knowledge about the social situations, such as educational status, age and sex differences, levels of kinship, housing quality, support networks, including private and financial insurance, the number of disabled peoples and etc. to analyze vulnerability and develop appropriate strategies, it would not be possible to deal with the effects of natural disasters such as earthquake.

In this regard, the present study attempts to assess social vulnerability of Zanjan city to earthquake using the Population and Housing Census 2006 and other graphical and descriptive information and databases of Zanjan city and using GIS analytical capabilities and AHP method.

2- Theoretical Bases

Social vulnerability approaches reflect the impact of social processes in vulnerability. Due to active and dynamic aspects of factors and social structure, these approaches are distinctly different from each other. Social vulnerability approaches describes this truth that vulnerability solely under the influence of proximity to and the nature of disasters but also depends on social status of communities. Those living in different social, cultural, economic and political situations have different levels of vulnerabilities.

Vulnerability is different based on age, gender, education level and knowledge, but the difference between different communities cannot be only explained based on these features, but the importance and role of the system and the ability of community to react and overcome the factors of damage must be focused on (Ahadnejad, 2009).

According to studies on theoretical principles of urban social vulnerability against natural hazards such as earthquake, three approaches including political-economy, structuralism and sustainable development are raised and are dealt with in this paper.

3- Discussion

The results of applying AHP method on the criteria evaluated in this study show that due to the difference in the amount of indices and different social characteristics of different urban areas, these areas have different vulnerability from each other. It is clear from the maps prepared in this article that informal settlement areas have high vulnerability because of having high population and due to lack of adequate housing, low economic-social indices as well as social deprivation from necessary land use during an earthquake, , and planning and organizing these areas by urban planners and managers are essential so that in the case of natural hazards such as earthquakes there would not be high vulnerability in these areas.

The results show that about 32.6 percent of Zanjan urban areas have high social vulnerability to earthquake. Also, approximately 39.8 percent of the city areas that mainly include middle texture and part of the fabric area have moderate vulnerability and finally only 27.5 percent of Zanjan, including newly built-up area that have better social and economic characteristics compared with other areas of Zanjan, has a low vulnerability.

4- Conclusion

Social vulnerability is the result of social inequalities in urban communities. According to the results of this study, cities have different social and economical structures therefore do not have the same vulnerability to natural hazards and among them urban problematic textures and informal settlements have high social vulnerability compared with other regions due to lack of socio-economic bases. So carrying out plans of organizing and fortification to reduce vulnerability to earthquakes in this region is more serious than other regions and custodians of urban affairs should pay more attention to it.

According to the results of this paper, in order to analyze urban vulnerability to natural hazards in developing countries such as Iran its main roots such as social inequalities, lack of principled planning, rapid population growth and urbanization of these communities should be researched.

5- Suggestions

- According to the importance of urban social vulnerability discussion to natural hazards, extensive studies, especially for metropolitan cities that are always vulnerable to these hazards are required.
- Forming databases consisting of socio-economical characteristics of urban residents in GIS for more precise and extensive studies of urban areas against natural hazards to be done based on these features.
- Developing analytical models consistent with native conditions of the country to evaluate vulnerability of cities to earthquake.

Keywords: Social Vulnerability, Zanjan, AHP, Earthquake, GIS