

Vulnerability Assessment of Rural Areas' Regarding Earthquake Risk (Case Study: The Central District of Marand County)

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Extended Abstract

1. INTRODUCTION

Natural disasters including earthquakes often have devastating effects on human settlements and make heavy losses of life and property of its inhabitants. Poor infrastructures of human settlements and socio-economic disparities between rural and urban areas have caused chaos in the settlement network of the country and has increased their vulnerability in the face of natural disasters. Due to our country's position and the position of villages in the earthquake vulnerable areas, serious attention to this problem is needed.

2. THEORETICAL FRAMEWORK

Vulnerability can be described as a lack of security against environmental threats. It results from a combination of processes that shape the degree of exposure to a hazard, sensitivity to its stress and impacts, and resilience in the face of those effects. All people, ecosystems, and regions confronting environmental or socio-economic stresses are potentially vulnerable to the impacts, of environmental hazards, but the level of vulnerability varies widely. According to the conceptual framework of vulnerability, recognizes and builds upon the three major dimensions of vulnerability exposure, sensitivity, and adaptation/resilience.

The vulnerability of a particular community or livelihood system is a function of three main factors:

- Exposure—the nature and extent of changes to which a place's climate is subjected to including changes in climate variability, hereunder the magnitude and frequency of extreme events.
- Sensitivity—how systems can be either positively or negatively affected by the change in climate.
- Adaptive capacity—how much capability a society has to adapt to the changes so as to maintain, minimize loss of, or maximize a gain in welfare.

The vulnerability of settlements or communities may be described as the extent to which a

settlement system is exposed and sensitive to negative implications of change, and the degree to which the subject community is able to anticipate, resist, cope with, adapt, or recover etc. The vulnerability of settlement systems, thus, includes not only susceptibility to physical changes, but more importantly the impact that such changes may have on social, economic, and ecological subsystems and processes on which communities are dependant.

Vulnerability is caused by a complex combination of socio-economic, physical, environmental, and political root causes, dynamic pressure and unsafe conditions. Political and economic ideologies affect the allocation and distribution of resources in a society, and are therefore the root causes of vulnerability. Dynamic pressures are the immediate manifestation of the underlying patterns and refer, among others, to population density and growth, unplanned urbanization, inappropriate land use, environmental mismanagement, social injustice, and poverty.

3. METHODOLOGY

The research population of this study is 74 villages of the central district of Marand County. In this regard, TOPSIS technique and Geographic Information Systems (GIS) were used. Also, AHP method was used for weighting the layers. According to previous studies, important and effective parameters the vulnerability caused by earthquakes in rural areas that in this research was used, included settlements texture (compression – open), the suitability of road network, settlements intensity, population density, female ratio, illiteracy ratio, population growth ratio, employment rate and economic activity, distance from health centers, vulnerable groups ratio (under 15 and over 65 years), household size, access to facilities, and health centers.

4. DISCUSSION

According to the country's location and village's situation in vulnerable areas of the earthquake,

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serious attention to this problem is required. In a rural settlement, the awareness of vulnerability before the crisis is extremely important in determining the directions of future development and prevention from irreparable human and financial losses. The purpose of this study is analysis of the vulnerability of rural settlements in the central district of Marand County.

5. CONCLUSION

Calculation of village's vulnerability in this study indicated that 27.03% of the villages have medium vulnerability and 33.79% of villages have high and very high vulnerability in the study area.

Investigation of the vulnerability of rural settlements in the region, indicated the vulnerability of medium, high, and very high at more than 59 percent of the rural population in the study area. From the physical-spatial dimension, 29/33% of the villages and from the socio-economic dimension, 44% of the villages have high and very high vulnerability and this is a serious threat to the increasing risk in the study area.

Key words: Natural disasters, vulnerability, rural areas, TOPSIS technique, Marand County.

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