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GEOMORPHOLOGICAL HAZARD MAPPING OF THE ZAYANDEH ROOD BASIN, IRAN

ABSTRACT: MARANI BARZANI M. & SALLEH K.B.O, *Geomorphological mapping hazard of the Zayandeh Rood Basin, Iran*. (IT ISSN 0391 - 9838, 2016)

River basins are morphological manifestations of the earth's surface and tend to be the focus of human activities and human population concentrations since the earliest human civilizations. This paper discusses a methodology that utilizes the combined use of different types of geomorphological hazards to describe the geomorphological hazard threat in the Zayandeh Rood Basin in Iran. Two major clusters of geomorphological hazards associated with tectonic and desertification processes were identified. The tectonic hazard parameters used in the analysis are magnitude, depth, faults zone and plate boundary activity. Whilst, the desertification hazard parameters are soil characteristics, climate quality, land use type, landform type, elevation and the location the sites.

KEY WORDS: Geomorphological hazard, Geomorphological hazard mapping, tectonic hazard, desertification hazard, hazard parameters, Central Iran.

1. INTRODUCTION

Geomorphological hazards are attributed to the impact of geomorphological processes. These hazards result from the endogenic and exogenic processes that occur on the earth surface. Earthquakes and volcanoes are endogenic processes and are exogenic hazards. Desertification, soil erosion and droughts are associated with sub-surface process and are categorized as exogenic hazards. Geomorphological hazards that describe each of the earthquake & desertification hazard were mapped and an integrated assessment carried out to create a composite geomorphological hazard map.

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Slaymaker (1996) and (Alcántara (2002) states that hazards are the result of the sudden changes in the long-term behavior of process behavior from their initial conditions. Geomorphic hazards are categorized as endogenous (volcanism and tectonics) and exogenous (floods, karst collapse, snow avalanche, channel erosion, sedimentation, mass movement, tsunamis and coastal erosion), and those induced by the climate and land-use change (desertification, permafrost, degradation, soil erosion, salinization and floods).

Hazard classification map are efficient tools for spatial viewing, assessing, predicting, preventing and managing of hazards (Kamp, 2008; Matteuccia, 2009). When an area is exposed to more than one hazard a composite hazard analysis of hazards based on overlaying of individual hazard map can identify the critical center of the composite hazard. Classification of hazard maps depend on the parameters that describe the hazard. Combination methods are used to associate hazard factors through the classification method. Several methods were used to integrate hazard parameters in a composite hazard analysis and includes using weighted averages, and the algebra and fuzzy model (Azarkar 2006; Ahmadi 2006; Afif 2010; Lee, 2010). A weighted average method is an average of two quantity variables. These weightings determine the relative importance of each quantity based on averages. Weightings are the equivalents of many similar items with the same average values. Through the weighted average method, one can estimate the conditional probability of the hazard in an area. To combine information of the selected layers for hazard, the weighted sum can be used. The combination method can also be used to combine the hazard map to display a multi-hazard map in a single map.

Earthquake and desertification are types of geomorphological hazards as a result of endogenic and exogenic geomorphological processes (Alcantara, 2002). In the Zayandeh Rood Basin, geomorphological hazards are active and affect human activities. It is very important to rec-