



Zoning vulnerability of climate change in variation of amount and trend of precipitation - Case Study: Great Khorasan province

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Climatic hazards have complex nature that many of them are beyond human control. Earth's climate is constantly fluctuating and trying to balance itself. More than 75% of Iran has arid and semi-arid climate thus assessment of climate change induced threats and vulnerabilities is essential. In order to investigate the reason for the changes in amount and trend of precipitation parameter, 17 synoptic stations have been selected in the interval of the establishment time of the station until 2013. These stations are located in three regions: Northern, Razavi and Southern Khorasan. For quality control of data in Monthly, quarterly and annual total precipitation of data were tested and checked by run test. Then probable trends in each of the areas was assessed by Kendall-tau test. Total annual precipitation of each station is the important factor that increase the sensitivity of vulnerability in the area with low rainfall. Annual amount of precipitation moving from north to south has been declining, though in different fields that they have different geomorphologic characteristics controversies occur. But clearly can be observed average of precipitation decline with decreasing latitude. There were positive trends in the annual precipitation in 6 stations, negative trends in 10 stations, as well as one station, has no trend. The remarkable notice is that all stations have a positive trend were in the northern region in the case study. These stations had been in ranging from none to Moderate classification of threats and vulnerability. After the initialization parameters to classify levels of risks and vulnerability, the two measures of mean annual precipitation and the trends of this fluctuation were combined together. This classification was created in five level for stations. Accordingly Golmakan, Ghochan, Torbate heydarieh, Bojnord and Mashhad were in none threat level. Khoor of Birjand and Boshruyeh have had complete stage of the threat level and had the greatest meteorological perspective risk. Finally, after determining the degree of threats, meteorological vulnerability zoning map was produced by kriging interpolation method and utilizing geographic information systems (GIS). It showed most studied areas were in complete level of investigation.

Keywords: Vulnerability, Climate threats, GIS, Zoning, Precipitation, Crisis management.