

Impacts of Abrupt Climatic Changes on Flood Susceptibility in Northern Sindh and Southern Punjab, Pakistan

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Abstract

Among all other disasters floods are the most destructive and common natural hazards. It not only endangers people's lives, land, and wealth but also destroys a country's economy. As a result, identifying flood-susceptible areas have significant importance for flood risk management as well as early disaster management plan. The main aim of this study is to classify flood susceptible areas using a frequency ratio model. The ten (10) conditioning factors including aspect, profile curvature, Elevation, slope, Normalized Difference Vegetation Index NDVI, Normalized Difference Soil Index NDSI, distance from road, distance from river, land use/land cover LULC, and rainfall were included. Total 230 flood location points were used to create the flood inventory map. The data was split into two datasets at random, with 70 percent (161 flood points) being used for preparation and the remaining 30 percent (69 flood points) being used for validation. The flood vulnerability map was divided into five zones, very low (19.73%), low (20.37%), moderate (20.37%), high (19.88%), and very high (19.62 %). District Jacobabad has high susceptible land as compare to other districts of the study area. This region is highly sensitive and has very low adaptive capability. Pakistan's share in Greenhouse gas emissions is relatively very low, but it is the most affected and vulnerable country by the impacts of climate change. Finally, the area under the ROC curve AUC was used to develop the presentation and prediction score, which yielded satisfactory results of 77.4%. The findings of this paper would be useful to planners, decision-makers, and future development programs in Pakistan.

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