

Title: APPLICATION OF GEOINFORMATICS FOR FLOOD STUDY AT TARAPUR UNION OF GAIBANDHA

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ABSTRACT

This study has been taken to develop vulnerability maps for agriculture using Remote Sensing (RS) and Geographic Information System (GIS) regarding different return period for flood hazard vulnerability assessment in a flood prone area, Tarapur union of Sundarganj thana under Gaibandha district of Bangladesh. The study mainly focuses on the development of a vulnerability function for preparing vulnerability maps for agriculture.

For the development of vulnerability function depth-damage relation has been followed. For establishing relationship between flood depth and agricultural damage, an extensive field survey has been carried out in the study area. Satellite images and other related data are also widely analyzed for establishing the relation more fruitfully. A Landsat and a Radarsat image of the study area have been used to identify agricultural land and for identification of flooded and non-flooded area.

Although the study area is located in a floodplain locality but the terrain is not so much flat. Due to this, depth of flood level varies in different location corresponding to a fixed level rise of water level. In this regard for the development of a depth-damage function, the study area has been divided into four categories based on the elevation. In monsoon (July to September), one meter rise of water level leads 100 % damage of all the crops in the very low lying river associated land. Whereas about 2 meter rise of water level causes 100 % damages of all the crops in low land and 2.5 meter and 3 meter rise of water levels causes 100 % damages in all medium and high land crops of the study area respectively.

For the development of flood inundation and flood depth map, Digital Elevation Model (DEM) and water level data of the study area have been collected from Bangladesh Water Development Board (BWDB). Water levels are used based on flood frequency analysis for 2-, 5-, 10-, 20- and 50-year return periods.

The agricultural land of the study area has been found in between the elevation >22.9 to <25.91 meter. Vulnerability function was based upon these land areas. The magnitude of vulnerability for agriculture of Tarapur union is found to increase linearly up to three meter depth of water and then it becomes horizontal.

From the vulnerability maps it has been observed that for all the return periods, the study area is very much vulnerable. And area close to river bank is relatively more vulnerable compared to the area far away from the river bank. Flood level due to 20-and 50-year return periods damages 100 % damages of crops.