

Assessment of Agricultural Damage under Different Simulated Flood Conditions

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Abstract : The study assesses the areal extent of riverine flood in the flood-prone area of Faridpur District of Bangladesh using hydrological model and Geographic Information System (GIS). In the context of preparing the inundation map, flood frequency analysis was carried out to assess flooding for different flood magnitudes. Flood inundation maps were prepared based on DEM, and discharge at the river using Delft-3D model. LANDSAT satellite images have been used to develop a land cover map in the study area. The land cover map was used for mapping of cropland area. By incorporating the inundation maps on the land cover map, agricultural damage was assessed. Present monetary values of crop damage were collected through field survey from actual flood of the study area. Two different inundation maps were produced from the model for the year 2000 and 2016. In the year 2000, the floods began in the month of July, whereas in the case of the year 2016 is started in August. Under both cases, most of the areas were found to have been flooded in the month of September followed by flood recession. In order to prepare the land cover maps, four categories of LCs were considered viz., cropland, water body, trees, and rivers. Among the 755791 acres area of Faridpur District, the croplands were categorized to be 334,589 acres, followed by water bodies (279900 acres), trees (101930 acres) and rivers 39372 (acres). Damage assessment data revealed that 40% of the total cropland area had been affected by the flood in the year 2000, whereas only 19% area was affected by the 2016 flood. The study concluded that September is the critical month for cropland protection since the highest flood is expected at this time of the year in Faridpur. The northwestern and the southwestern part of the district was categorized as most vulnerable to flooding.

Keywords : agricultural damage, Delft-3d, flood management, land cover map

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