Flood classification of 2003 floods in Kushabadra river using remote sensing and GIS

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Floods are the major disaster affecting many countries in the world year after year. It is an inevitable natural phenomenon occurring from time to time in all rivers and natural drainage systems, which not only damages the lives, natural resources and environment, but also causes the loss of economy and health. The impact of floods has been increased due to number of factors, with rising sea levels and increased development on flood plain(Sanders and Tabuchi, 2000).Recurring flood losses have been handicapped the economic development of both developed and developing countries.

In this study an attempt has been made to develop an integrated methodology for flood mapping using satellite images and Geographic Information System and Hydrodynamic modeling for September 2003 flood phenomenon in Puri District, orissa in India.The Model was based with two sub streams named Dhonua nadi and Achutpure Branch, which were affected to inundate of this area.

Analysis from RADARSAT data by visual interpretation and digital interpretation gives quite a reliable and stable inundation extent. Multi-temporal RADARSAT images with 50 m resolution of 4th, 11th 13th and 20th September 2003 were used for digital and visual interpretation and digital analysis for generating the flood inundation map. Depending on the DN values, the flood maps have been sliced into 3 classes as "Deep", "Moderate" and "shallow'. A comparative analysis of inundation extent was done and calculated the flood extent area. The inundated area of this zone was much higher near to the left bank than to the right bank of the river due to unprotected embankment.

The MIKE 11 1- D Hydrodynamic Model was used in this study with 4 (Four) major input data sets, River network, Cross sections, Hydrographs DEM(Digital Elevation Model) and simulation process has been occurred to generate the flood extent maps.

Comparison of flood inundation maps have been made between the MIKE 11 Model output and flood extent which was detected by RADARSAT imagery.

Use of GIS will provide supplementary data in Hydrology for such analysis and will lead to easier interpretation and understanding of flood phenomena and characteristics. The use of Digital Elevation Model (DEM) can be effectively used for simulation of flood extent.

Key words: Flood, Disaster, Remote Sensing, GIS, India

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