

# INTEGRATION OF REMOTE SENSING DATA WITH A NUMERICAL MODEL TO PREPARE ACCURATE FLOOD HAZARD MAPS FOR EFFECTIVE FLOOD MANAGEMENT IN THE MEKONG DELTA

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**Abstract:** Flooding in the Mekong basin is a recurrent event and floods occur during the rainy season, from July to December. One-dimensional (1-D) hydraulic models are being widely used in the basin for flood modelling. Although the 1-D models are computationally efficient, but they may not be accurate enough to deal with large and complex river/canal systems with various hydraulic structures. In this study, the Mike-11, a quasi 2-D model was used in combination with GIS, remote sensing for preparing accurate flood maps for enabling risk-based landuse planning and infrastructure development. Satellite images were used to analyze the flood extents for calibration of the model. The calibrated model would be useful to predict floods of different return periods. Twelve ALOS/PALSAR images with the resolution of 100 m were used to extract the flood extent in 2010. Eleven images from August to December 2010 were acquired during the flood season whereas one image was acquired during the dry season (May 2009). The flood maps were created by establishing a threshold between the change of backscatter values between the flood and the dry season images. Flood maps of 26 September and 20 October 2010 were prepared by using the Mike-11 model and compared with the flood maps obtained from the satellite data of the same dates. Flood extents were reasonably close between the model simulated and satellite data derived flood maps. However, there were discrepancies in some areas due to insufficient model calibration, non-availability of high-resolution DEM etc. Flood damage data were collected from An Giang and Dong Thap provinces focusing on crops (mainly paddy) and residential areas. Paddy areas affected by the flood in 2001 were 3,638 ha and 95,955 ha in An Giang and Dong Thap provinces respectively. The estimated damages to crops were 806,018,653,138 VND and 30,561,394,735 VND respectively. The flood inundated approximately 14 km<sup>2</sup> and 37 km<sup>2</sup> of residential areas in An Giang and Dong Thap provinces respectively in 2010 and the corresponding damages to residential areas were estimated to be 2,428,611,734 VND and 5,042,630,131 VND respectively.