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Assessment of the Number of Damaged Buildings from a Flood Event Using Remote Sensing Technique

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Abstract : The heavy rainfall from 3rd to 22th January 2017 had swamped much area of Ranot district in southern Thailand. Due to heavy rainfall, the district was flooded which had a lot of effects on economy and social loss. The major objective of this study is to detect flooding extent using Sentinel-1A data and identify a number of damaged buildings over there. The data were collected in two stages as pre-flooding and during flood event. Calibration, speckle filtering, geometric correction, and histogram thresholding were performed with the data, based on intensity spectral values to classify thematic maps. The maps were used to identify flooding extent using change detection, along with the buildings digitized and collected on JOSM desktop. The numbers of damaged buildings were counted within the flooding extent with respect to building data. The total flooded areas were observed as 181.45 sq.km. These areas were mostly occurred at Ban khao, Ranot, Takhria, and Phang Yang sub-districts, respectively. The Ban khao sub-district had more occurrence than the others because this area is located at lower altitude and close to Thale Noi and Thale Luang lakes than others. The numbers of damaged buildings were high in Khlong Daen (726 features), Tha Bon (645 features), and Ranot sub-district (604 features), respectively. The final flood extent map might be very useful for the plan, prevention and management of flood occurrence area. The map of building damage can be used for the quick response, recovery and mitigation to the affected areas for different concern organization.

Keywords : flooding extent, Sentinel-1A data, JOSM desktop, damaged buildings
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