

# Novel Approach to Accurate and Rapid Flood Mapping Using Single SAR Image

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## Abstract

Flooding is the most common disaster in Asia, initiatives such as Sentinel Asia has been providing satellite imagery via WEB-GIS technologies for disaster management activities. Sentinel Asia has been providing SAR (Synthetic Aperture Radar) imagery for rapid flood mapping. The technique uses dB value difference between the pre-flood image and the flood data image to identify the flood area using a threshold. This technique is not effective in identifying the actual flood area as it identifies dried water bodies in the pre-flood image as flooded area and partially flooded paddy fields as dry land. Through our work we have introduced a novel approach using a fusion of statistical modeling of SAR image dB values and past optical data to accurately identify the flood area for rapid flood mapping. This technique was able to accurately identify the partially flooded paddy area improving the flood mapping accuracy by 20%. The use of archived optical data also enables the model to accurately identify the perennial water bodies otherwise identified as flooded area. The ability to use a single SAR image is another major advantage of this approach. Overall this approach is able to generate faster maps with better accuracy compared to the existing methods used for rapid flood mapping.