

Analysis of the effect of rapid urbanization on flooding in Naga City, Philippines using Landsat image analysis and flood modeling

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SUMMARY

Rapid urbanization lead to drastic changes in land cover as the demands for space and resources increase with exponential population growth. In many cases, these land cover changes result to drastic environmental consequences such as flooding. In 2010, the province of Camarines Sur with 19.2% of its area at risk was identified as the top 20 province most susceptible to flooding in the Philippines. The capital of the province, Naga City is situated within the catchment area of Bicol River Basin. The study conducted by Worldwide fund for Nature (WWF) and Bank of the Philippines (BPI) Foundation shows high vulnerability of the city to such disaster. Aside from its geographic location, the city has also experienced a rise on its population with 52% increase in a 30 year period from 1990 to 2010. This rise in population can be associated with higher vulnerability to flooding hazard. This paper analyzed the relationship of land cover changes to increased surface runoff that directly cause increased flood incidences in the city. The researchers utilized Landsat MSS and ETM+ images to track 30-year land cover change (1984-2014) in Bicol River Basin. Flood models were then created with latest available LiDAR DEM and discharge data in a 100-year RIDF. Critical areas affected by land cover change and increased flooding were then identified for disaster risk mitigation and land cover rehabilitation.

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