

## Combined Analysis of Land use Change and Natural Flow Path in Flood Analysis

**Authors :** Nowbuth Manta Devi, Rasmally Mohammed Hussein

**Abstract :** Flood is one of the most devastating climate impacts that many countries are facing. Many different causes have been associated with the intensity of floods being recorded over time. Unplanned development, low carrying capacity of drains, clogged drains, construction in flood plains or increasing intensity of rainfall events. While a combination of these causes can certainly aggravate the flood conditions, in many cases, increasing drainage capacity has not reduced flood risk to the level that was expected. The present study analyzed the extent to which land use is contributing to aggravating impacts of flooding in a city. Satellite images have been analyzed over a period of 20 years at intervals of 5 years. Both unsupervised and supervised classification methods have been used with the image processing module of ArcGIS. The unsupervised classification was first compared to the basemap available in ArcGIS to get a first overview of the results. These results also aided in guiding data collection on-site for the supervised classification. The island of Mauritius is small, and there are large variations in land use over small areas, both within the built areas and in agricultural zones involving food crops. Larger plots of agricultural land under sugar cane plantations are relatively more easily identified. However, the growth stage and health of plants vary and this had to be verified during ground truthing. The results show that although there have been changes in land use as expected over a span of 20 years, this was not significant enough to cause a major increase in flood risk levels. A digital elevation model was analyzed for further understanding. It could not be noted that overtime, development tampered with natural flow paths in addition to increasing the impermeable areas. This situation results in backwater flows, hence increasing flood risks.

**Keywords :** climate change, flood, natural flow paths, small islands

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