GIS Model for Flood Risk Mapping

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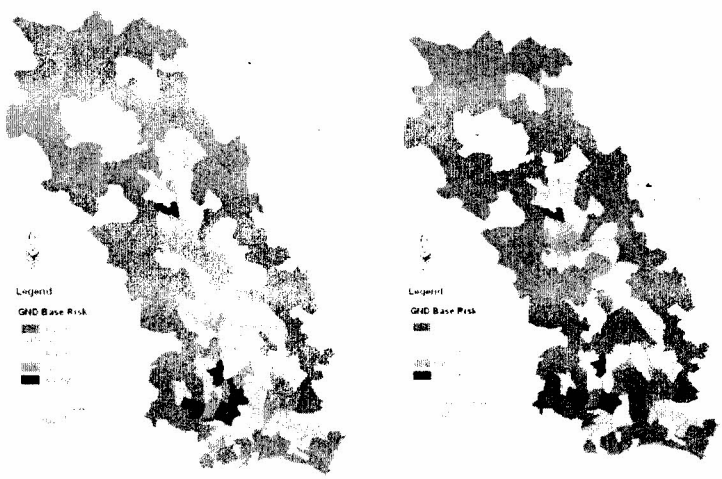
Flood risk mapping is an important measure in mitigating impacts due to floods. A flood risk map over an area will enable inhabitants to take precautionary actions that will mitigate negative impacts due to floods. Among many methods used in the development of flood risk maps, use of GIS technology has received a wide interest due to its versatile capabilities. This paper presents the use of a GIS technology based model for the preparation of a flood risk map at Grama Niladari Division (GND) level for Nilwala river basin in Southern Sri Lanka.

Flood risk mainly depends on flood hazard and vulnerability. Inundation area and inundation depth are two criteria that determine flood hazard while factors such as population density, building types, road network, etc., determine vulnerability. Though GIS technology provides facilities to calculate flood risk at GND level, the process could be very tedious and time consuming, especially if the process is to be repeated. The model builder, which is a part of ArcGIS geo-processing framework can be used to automate GIS processes by linking data input, ArcGIS tools/functions, and data output and makes the task easier. A GIS model was built for mapping flood risk of the Nilwala river basin at different flood frequencies. GND based flood risk maps for two different floods frequencies are presented in Figure 1.



(a) 100 year flood (b) 10 year flood

Figure 1. GND based flood risk maps for 100 year and 10 year floods

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