Flood hazard mapping and damage assessment in lower basin of Kelani river

Manjula Ranagalage [1] Lasantha Manawadu [2]

1. *Lecturer (Probationary), Department of Social Sciences, Rajarata University of Sri Lanka*

2. *Senior Lecturer, Department of Geography, University of Colombo*

Abstract

A flood is defined as a body of water that rises to overflow into land settlements which are not normally under water. When there is heavy rainfall in the catchment areas it is natural that flood situation will arise. Floods invariably create problems of a serious nature. Hence it is considered a natural disaster. Flood was identified as most common and damage natural disaster in Sri Lanka. It has proved in history and obvious as the country's topography and location. The water resources map of the country identified 103 river basins of which about 10 rivers are considered as major. Among these major rivers, Kalu, Kelani, Gin, Nilwala and Mahaweli are vulnerable to floods. Flood Hazard Mapping is a vital important for appropriate land use planning in flood-prone areas. It creates easily-read, rapidly-accessible charts and maps which facilitates the administrators and planners to identify areas of risk. It will help to implement a proper damage assessment in the hazard area. Identification of deferent levels of inundation areas is vitally important in the flood management process.

Floods in Kelani River area is important due to its outfall being near the capital city of Colombo. Colombo and Gampaha districts which are frequently and considerably affected by flood events. The experts warn that if the flood level of Kelani River reaches 13 feet from msl, the floods would inundate areas up to Thimbirigasyaya. Therefore preparation of flood hazard mapping and damage assessment will help to manage the flood in the area.

Objectives of the study are preparation of flood hazard maps for deferent elevation ranges in the lower basin of Kelani River and demarcate and calculate the inundation area and damage assessment in different elevation ranges.

Contour data, Land use and land cover, river networks, building layer, administrative boundaries, roads and high resolution satellite images were used for the development of the model and prepare flood hazard maps and damage assessment. Using Geographical Information System (GIS) developed a Digital Elevation Model (DEM). Cell base analysis in GIS demarcates hazard area in different flood ranges and raster overlay function identifies flood vulnerable area.