

## **Mapping of flood hazards in relation to agriculture in Nilwala Upper Basin**

D.L.W.S. Pushpakumara<sup>1</sup>

Champa M. Navaratne<sup>1</sup>

<sup>1</sup>Department of Agricultural Engineering,

Chandana P.Gunasena<sup>2</sup>

Department of Geography,

University of Ruhuna

**Keywords: Flood hazard mapping, GIS, flood frequency analysis**

Watershed management is very important for management of hazards. Flood hazard mapping has particularly been realized as one of foremost tasks to be accomplished in support of disaster management and sustainable development.

The study intended to determine the effect of hydrological behavior of the Nilwala upper catchment corresponding to the flood, to prepare maps for the flood inundation and the effect of damages to agriculture with reference to the major historical floods and, to identify flood management and flood-disaster mitigation strategies. Long-term historical time series data on stream flow at Bopagoda, and rainfall at Mawarala, Panilkanda, Aninkanda and Arpthop were analyzed to discern changes in hydrologic effects at Akuressa and Aturaliya Divisional Secretariat Divisions, which are frequently and considerably affected by floods. Damages and flood level data were collected by a field survey. Flood frequency analysis was used to predict the flood events. Changes in rainfall and runoff pattern and flow regime during 30 years were studied. ArcView GIS software was used for GIS analysis and mapping.

The rainfall varies from 2500mm to 4000mm with an average annual rainfall of 3386.8 mm. An increasing trend of annual rainfall is shown while runoff and runoff to rainfall ratio are decreasing due to decreasing the base flow runoff. However, in short term, there is a linear relationship between rainfall and runoff. Frequency analysis resulted 682.2, 1053.0, 1543.2, 1914.0 discharges in cumsec (m<sup>3</sup> per second) for 5 year, 10 year, 25 year and 50 year return periods respectively. The return period of flash flood may occur by 25 to 30 years. The flood has mainly affected the paddy cultivation in the area. Future mitigation measures should be focused on the routing high intensity storm runoff and adjust the cultivation practices according to rainfall pattern.