

## **Use of a hydrodynamic model to predict Kalu Ganga floods**

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Flooding is one of the most frequent and devastating natural hazards in the Kalutara and Ratnapura districts of Sri Lanka. These floods are due to Kalu Ganga, which flows through these two districts. Floods in these areas have caused impacts on society that go beyond economical cost and facilities, including impacts such as family and community disruptions, dislocation, injuries and unemployment. For example, during the recent major flood in the year 2003, about 52,000 families were evacuated. It is therefore, very vital in these areas to control or make the public aware in advance of such floods to minimize negative impacts due to floods.

Controlling floods using structures, such as flood control reservoirs, could be very expensive. Besides they can create many negative environmental impacts. By warning people at risk in advance of

possible floods based on a flood forecasting mechanism the damage due to floods could be minimized.

Floods along a river could be simulated based on a hydrodynamic model, which enables forecasting of floods at downstream locations. This paper presents the use of the hydrodynamic model HEC-RAS in the prediction of floods along the Kalu Ganga from Ratnapura to Kalutara. The model requires river geometry and friction as the basic data in addition to hydrological data. The model was calibrated for the Kalu Ganga based on rating curves at several sections along the river and verified based on a historical flood event.

The model predicts the time a flood would take to travel from Ratnapura to any location downstream up to Kalutara. Its prediction includes the magnitude of the flood at the location of interest. The model also provides the inundation area along the river.

Key words: Flood forecasting, hydrodynamic model