

**SIMULATION OF COASTAL FLOOD AND RIVER FLOOD IN NILWALA RIVER BASIN**

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Ocean wave and tide fluctuations significantly impact the duration of flooding in downstream floodplains. However, studies on the combined effect of coastal and river floods are lacking in the Sri Lankan context. To fill this gap, a case study based on numerical simulation of the river and coastal floods is carried out in the Niwala River. This aimed to identify a one-dimensional river flood model to couple both flood waves and coastal waves and to simulate the effect on kinematic, diffusion, and dynamic behaviour of the one-dimensional shallow water equation. The one-dimensional non-linear shallow water equation is solved by the finite difference method. The model results are verified by a real flood that occurred at Nilwala River in May 2017. Hourly flood discharge at Pitabaddara from May 24<sup>th</sup> to May 28<sup>th</sup> 2017, and hourly water level change at sea outfall are the upstream and downstream boundary conditions for the model, respectively. Digitized riverbed elevation, river width, cross-sectional river area, and hydraulic radius were fed to the model. The downstream flood can be accurately simulated by the dynamic equation, but computational time is approximately five times higher than the kinematic equation. However, upstream flooding can be simulated with kinematic equations, and computational time is comparatively less. Floods in other river basins can also be simulated from this model. The accuracy of the analysis can be increased by using more detailed topographic data in future studies.

**Keywords:** Coastal flood, Nilwala river, River flood, 1D shallow water equation