



Development of a Rainfall Runoff Model for Upper Gin River Basin

K.L.A. Rangana^a, N.D.P. Ransara^b and G.H.A.C. Silva^c

*Department of Civil and Environmental Engineering, Faculty of Engineering,
University of Ruhuna.*

^a*aparnaliyanage91@gmail.com*

^b*ndpransara@yahoo.com*

^c*amila@cee.ruh.ac.lk*

Abstract

Flooding is one of the major natural disasters all around the globe that cause a high damage to the infrastructure, agriculture and human lives. In recent years the intensity and frequency of floods have been increasing arguably as a result of climate change. Such damages can be minimized if reliable information about flooding events is readily available for relevant authorities and land owners. Hydrodynamic flood models play an important role in producing inundation maps which then can be used in flood risk assessment and management. In developed countries, there can be seen many applications of flood modelling where as in Sri Lanka flood modelling is still a developing area. Advanced determining methods of flooding scenarios consist of construction of a physically based 2D hydrodynamic model. The model is then calibrated and validated using historical flood data. In the process of preparation of the flood model, a reliable Rainfall Runoff model should be developed. The accuracy of the flood model largely depends on the accuracy of the Rainfall Runoff model since the Rainfall Runoff model addresses the catchment characteristics of the area. Gin river is one of the main sources of water supply in southern region of Sri Lanka having a catchment area of 932 km². The upper basin area of the Gin river had experienced severe floods in years 2003 and 2008 where in 2003 flood 17 lives were lost. With the availability of a reliable flood model, better planning and managing can be done to minimize the damages from floods. This paper presents the development of the validated Rainfall Runoff model which is a prerequisite to the development of 2D flood model. A Sacramento model integrated with Muskingum routing method is used in development of the Rainfall Runoff model.

Keywords: *Flood modelling, SOBEK, Rainfall-Runoff, Sacramento, Muskingum routing.*