

Evaluation of Flooding in Sg Gita Catchment, Kuching

D.Y.S. Mah^{a,*}, C.P. Hii^b, C.Y. Ong^b and Y. Pui^b

^a*Hydro-Environmental Engineering Research & Development (HERD) Cluster, Department of Civil Engineering, Faculty of Engineering, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak*

^b*Jurutera Adda Consulting Engineers, Bangunan USC, No 683, Lorong Song 1A, Off Jalan Song, 93350 Kuching, Sarawak*

Abstract

This paper outlines a methodology of flow routing with inclusion of downstream river water level applied to a Sg Gita urbanized catchment beside Sg Sarawak in Kuching city, Sarawak, Malaysia. Evaluations are done by demonstrating the modelling of flooding scenarios using InfoWorks River Simulation (RS) that stresses on different aspects specific to Sg Gita's conditions, namely (1) impacts of high and low river water levels, (2) solely urban flooding and (3) the combination of the two. The outcomes indicate that the dynamics of downstream river water level influences the performance of the urban drainage that flowed into the river. Backwater is overriding the flows of urban drains. Therefore, the mentioned methodology is found superior than conventional methodology with only flow routing to represent the flow mechanism of urban catchment bounded by a downstream river.

Keywords: backwater, InfoWorks RS, river water level, stormwater, urban drainage

1. Introduction

Sg Gita catchment is located immediate upstream of Satok Bridge (seen on the left of Figure 1). The area is one of the highly flood prone area in Kuching city beside Sg Maong catchment at the opposite bank [1],[2]. Its oldest settlement, Kpg Gita flanks a stretch of the northern bank of Sg Sarawak. As such, it suffered repeating flooding as reported in the major flood events in 2003, 2004 and 2009 [3]; as well as the recent 2013, 2015 and 2016.

2. Rationale for flood investigation

Before any flood mitigation measures could be prescribed to Kpg Gita, the cause of flooding at the area should be thoroughly scrutinized. This has become the intention of this paper to reconstruct a historical flood event to provide insights to the occurrence of flood. Evidenced in Figure 1, Sg Gita catchment has been heavily populated. Therefore, land drainage, in this case, the urban stormwater drainage is significant [4]; at the same time, due to the closeness to Sg Sarawak, the hydrology and hydraulics of the river also play a role.

* Corresponding author. Tel.: +6082-583207; fax: +6082-583410
E-mail address: ysmah@unimas.my

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