

Modelling Approaches for Minimally Gauged Sg Similajau, Bintulu

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Abstract

Minimally gauged river basins are common in Sarawak. Many river basins are lacking in hydrological monitoring mechanism mostly due to the vast land mass and complex river network, hence causing isolation of certain locations. This paper is describing the approaches to model Sg Similajau of Bintulu, Sarawak with little information to support sound analysis. A river model is developed to reconstruct missing flows of the river. In order to have reliable results, a short-term monitoring program is strongly suggested to collect data pertaining to river processes in the field. Pre-processing processes are demonstrated to obtain inflow data for upstream boundaries, tide/King Tide data for downstream boundary and a weir at Samalaju Water Intake for middle boundary. Particularly the weir, its presence convinces the verification of the river model. Post-processing on the impacts of the weir in flow patterns, in this case the water head produced by the weir and with such a head to flush out saltwater brought about by tides are demonstrated as ideal tool to test the model.

Keywords: broad crested weir, HEC-HMS, InfoWorks RS, river flow, salt transport.

1. Introduction

Sg Similajau covers a basin area of $\sim 636.5\text{km}^2$ (see Figure 1). In terms of hydrological monitoring, only two stations are available. The only rainfall station in the basin, namely Kuala Similajau station is located 3km from the estuary. The only water level station, namely Sg Similajau station is located 28km from the estuary, a distance out of tidal influence. No rating curve is provided by the Sarawak Department of Irrigation and Drainage (DID). With only two monitoring stations that each with distinct measuring parameter, the river basin is classified as minimally gauged [1].

Previously, the river basin is scarcely populated and the major land use is agriculture land. Therefore, hydrological monitoring network is kept at minimal. With Samalaju Town being identified as an industrial park under the Sarawak Corridor of Renewable Energy (SCORE) initiative [2], physical development is underway. As such, hydrological analysis of the river basin is gaining importance to guide the planning of water resources for any intended growth [3]. For instances, water is demanded for industrial uses such as in the aluminum and downstream palm oil productions; water is required for daily living of workers/human population attended to the industries and so on.

This paper is therefore meant as a lesson learnt to solve the problem of minimally gauged Sg Similajau, in which critical hydrological data is lacking to support sound hydrological analysis [4],

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