

## ABSTRACT

Maluku is an island with sloping and hilly topography where parts of its alluvial fans along the shores are inhabited by residents. They live in the prone area due to few ideal place for settled. Therefore, it need mitigation work to reduce casualties especially fatalities such as increasing community resilience to disaster by providing early warning systems and hazard maps. The research was conducted in Nasiri Village, Huamual District, Seram Bagian Barat Regency, Maluku Province. The purpose of this research are flash floods reconstruction, SIMLAR v1.0 software assessment, making flash flood hazard maps and estimating flood time arrival.

The method used in the simulation of flash flood in this study is a two-dimension (2D) numerical modelling using SIMLAR v1.0 software. Generated 10-meter resolution DEM from data contour of detail engineering design (DED) used for both reconstruction of flash flood and the creation of hazard maps. Nakayasu Synthetic Unit Hydrograph (SUH) was used as unit hydrograph to make flood hydrograph from daily rainfall data records which is distributed in hours using Ambon model rainfall distribution. Sensitivity analysis limited to n Manning roughness coefficient, slope of inflow point ( $S_0$ ), time step ( $\Delta t$ ), and movable bed material thickness and flow depth of several known flow depth points from previous flood event were used in parameter calibration processes.

The results from sensitivity analysis showed that the model is sensitive to n Manning roughness coefficient and the thickness of movable bed material. In the parameter calibration process, the value of n Manning and movable bed material respectively  $0.05 \text{ s/m}^{1/3}$  and 3 meters provided good accuracy in the reconstruction of flash flood event with a value of root mean square error (RMSE) 0.213 meters although its value is not the smallest. Moreover, hazard maps generated from SIMLAR v1.0 software is able to provide a clear boundary of the danger area but the use of SIMLAR v1.0 to estimated flood time arrival is unrealistic.

**Keywords:** flash flood, hazard maps, 2D numerical model, Nakayasu SUH, SIMLAR.