

ABSTRACT

The management of water resources in Indonesia has increased over time. This increase is evident in the number of water structures such as reservoirs, dams, drainage channels, and flood control structures. Despite the improvement in management, natural disasters such as floods are sometimes unavoidable. Flood events cause many losses, one of which is in the agricultural sector. The Batanghari watershed, which has a total area of 5,478,829 hectares, is divided into five sub-watersheds, namely Batanghari Hulu, Batang Tebo, Batang Tabir, Batang Merangin-Tembesi and Batanghari Hilir, all of which have relatively high water resource potential. The potential of natural resources owned by the Batanghari watershed, if not properly managed, will have an impact on the surrounding, one of which is the damage that occurs around the watershed. This study aims to produce Synthetic Unit Hydrograph modeling, namely the value of the peak discharge amount using several return times. The research uses secondary data as input to perform hydrological analysis and produce hydrograph models. This research uses Nakayasu Synthetic Unit hydrograph modeling. The stages of this research began with the collection of rainfall data (10 years) and river discharge. The next step is to calculate the regional rainfall using the isohyet method, then frequency analysis is performed on the rainfall data using several methods, including normal, Gumbel, log person type III, and log normal methods, then frequency distribution analysis tests are performed using two methods, namely chi-squared and smirnov-kolmogorov. The value obtained from the distribution analysis is then input into Nakayasu modeling, which produces peak discharge values using multiple return times. The results showed that after the hydrological analysis stage, the rainfall value of the Gumbel method represents the rainfall data to be used. The peak discharge value of Nakayasu modeling with a return period of 2, 5, 10, 25, 50, and 100 year ranges from 16,000 to 32,000. This modeling can be compared with other synthetic hydrograph modeling using different parameters.

Key word: Watershed, Hydrological Analysis, Hydrograph