

# **ANALYSIS OF FLOOD EVENT IN BATANG MAHAT, LIMA PULUH KOTA REGENCY, WEST SUMATRA**

**THESIS**

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Andalas University*



**MASTER STUDY PROGRAM OF CIVIL ENGINEERING  
DEPARTMENT OF CIVIL ENGINEERING  
FACULTY OF ENGINEERING – ANDALAS UNIVERSITY  
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## ABSTRACT

*Batang Mahat in Lima Puluh Kota Regency is an area that is prone to Flood. The flooding phenomenon in Batang Mahat almost occurs every year. Significant floods events recorded to have occurred in 1961, 1968, 1972, 1978, 1984, 1991, 1998, 2005, 2017, 2019 and 2020. The biggest flood event that occurred in Batang Mahat was in march 2017. This research created the flood inundation map and analysed the causes of flooding in Batang Mahat using HEC-GeoRAS 10.8 software along with ArcGIS 10.8.1 and HEC-RAS 6.2. A high-resolution DTM is required for the analysis in HEC-GeoRAS. This research used Log Person type III and Nakayasu Synthetic Unit Hydrograph for the Hydrology analysis. The simulation was done at the area of 9.26 km<sup>2</sup> in Batang Mahat, starting from Batu Kisok to the upstream part for six return periods as 2-year, 5-year, 10-year, 25-year, 50-year, and 100-year. The result shows an inundation of floods that occurred in Batang Mahat even at the discharge of the Q5-year return period. The flood in 2017 indicated a flood that occurred with a discharge of a Q50-year return period (2003.07 m<sup>3</sup>/s) and inundated 2.47 km<sup>2</sup> out of 9.26 km<sup>2</sup> area in total. The result implies the flood that occurred in Batang Mahat caused by Channel capacity is not enough to carry the flood water discharge, narrowing of the river channel at Batu Kisok, and the effect of the land use change. As a result, it can be concluded that the flooding phenomenon will always be a problem around the Mahat watershed. Therefore, the flood incident in Batang Mahat, especially in the Pangkalan Koto Bharu district, was an event that could be considered serious and urgently needed to be addressed.*

**Keywords:** Flood, Inundation Map, Batang Mahat, HEC-GeoRAS, ArcGIS, HEC-RAS.

