

KAJIAN SISTEM PERINGATAN DINI BANJIR DI DAERAH ALIRAN SUNGAI GARANG

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ABSTRACT

Rapid development has caused the downstream area of Garang River basin, which cover northern part of Semarang city, developed into a dense area of residential, offices, education facilities and trading centers. West Floodway was part of flood disaster mitigation, but several flood events still caused losses. Therefore, a flood early warning system is needed in order to minimize losses due to flooding by providing faster river condition informations and adequate time for flood control.

Flood early warning system in this study is focused on hydrologic analysis factors, which are critical rainfall characteristic and warning time affected by flood travel time. Modeling of rainfall into discharge was done by *HEC-HMS* software, while downstream discharge modeling was using *HEC-RAS* software to obtain critical limit of river capacity and flood potential locations.

The simulation results show the 20-year flood discharge may cause disastrous flooding in downstream areas of Garang river basin. Critical flood discharge, that is around $550 \text{ m}^3/\text{s}$, can occur due to cumulative rainfall depth of 94 mm or greater, which took place within 2,86 hours or less. During this detection time, early monitoring can be carried out in several readiness stages based on the cumulative rainfall within certain periode of time, in order to increase response time.

Key words: *flood early warning system, critical rainfall depth, HEC-HMS, HEC-RAS*