

STUDI PEMBERDAYAAN SISTEM PERINGATAN DINI BANJIR KALI WELANG SEBAGAI UPAYA PENGURANGAN RESIKO BENCANA DI KOTA PASURUAN

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ABSTRACT

Welang river watershed of 507.36 km² cross three regions (Malang regency, Pasuruan regency and Pasuruan town). Flood occurring in January 30, 2008 due to overflow was the greatest flood in Pasuruan town. To reduce impact induced by Welang River flood, Balai PSAWS Gembong-Pekalen implemented flood early warning system by placing water surface level observation station in two locations: Selowongko Dam (sta. 24.940) and Kraton Bridge (sta. 650).

Effort to use and improve performance of Welang River flood early warning system is important to provide fast and accurate information. This research was done by literary study and collecting secondary data consisting of daily rainfall data, flow rate data, and data of Welang River geometry along 24.95 km. Hydrology analysis and simulation was done to get parameter and characteristic of Welang River watershed with software HEC-HMS version 3.3. This research did existing river capacity simulation and flood routing of river course from control point to point predicted causing flood to get travel time and water surface level causing flood with software HEC-RAS version 4.0.

Results indicated that placing water surface level control point at sta. 24.950 was not effective because there was lateral inflow at downstream part. To anticipate it, water surface level observation station was determined in two location: bridge in Pakijangan village (sta.17.050) and Welang River Dam (sta. 6.450-sta. 6.500). Determination of water surface level limit for control point 1 was <1.4 m, "normal", 1.4-1.6 m "ready" (green), 1.6-2.1 m "alert" (yellow), and >2.1 m "watchful" (red). Determination of water surface level limit for control point 2 was <1.6m "normal", 1.6-1.8 m "ready" (green), 1.8-2.2 m "alert" (yellow), and >2.2 m "watchful" (red). Travel time of 10 years return period of flood (Q₁₀) from control point 1 (sta. 17.050) to flood control point (sta. 1.050) was 138 minutes and that from control point 2 (sta.6.450-sta.6.500) to flood control point (sta.1.050) was 94 minutes. This research shows Standard Operating Procedure that adapted with needs and characteristics of local community so hopely can increase the awareness and preparedness of community in face flood disaster.

Keywords: flood early warning system, travel time, ready status