

## **ABSTRAK**

### **FLOOD ANALYSIS OF WAY BESAI RIVER USING HEC – RAS MATHEMATICAL MODEL**

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River flood control projects include two important analyses, hydrological analysis and hydraulics analysis. In the hydrological analysis, design flood calculation is one of the main objectives in the river flood control projects. The calculation is based on the flow data of the river or through the rain - discharge conversion using empirical equations. On the other hand, the analysis of hydraulics is also important to design the river capacity in order avoid flood.

Hydraulics analysis carried out in this research is for Way Besai River using HEC-RAS which is a continuation of hydrological analysis. In hydrological analysis, on a condition where there is no measurement field data, bankfull capacity of the river is used as a calibration material for Q2. The weakness of design flow calculation by using rainfall data is that we should always assume that the rainfall occurs in the entire watershed. As a consequence the result of the design flow is sometimes too large or over-estimated. The use of several methods of hourly rainfall distribution which is usually used for security purposes for large dams should be different from the ones for flood control projects to avoid over design in hydraulic structures.

In hydraulics analysis using HEC-RAS, the difference principle between steady flow and unsteady flow mode lies in the type of flow input. Steady flow mode is using a constant flow of data as the flow input. While unsteady flow mode is using hydrograph flow data as the flow input. In HEC-RAS, the use of steady flow and unsteady flow modes also depend on the user's experience.

Hydrological analysis and hydraulics analysis in Indonesia are still based on approaches which supported by logical reasons. Therefore project work experience is a very important asset that will affect the accuracy of the analysis.

*Keyword: River, Flood, Hydrology, Hydraulic, HEC-RAS*