ANALISIS KETELITIAN RUMUS EMPIRIS INTENSITAS-DURASI-FREKUENSI HUJAN UNTUK HITUNGAN BANJIR RANCANGAN
(Studi Kasus di Lereng Gunung Merapi)

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ABSTRACT

Rainfall data quality in Indonesia for the calculation of design floods are generally inadequate because most are only available daily rainfall data. Empirical formulas to calculate rainfall intensity by using daily ranfall data that commonly used in Indonesia are Mononobe and Haspers formulas. The Mononobe formula contains a constant that its validity need to be considered in connection with the characteristics of rainfall variability in different regions. In order to obtain an accurate design flood, the constant value of Mononobe formula need to be corrected.

Accuracy analysis based on intensity-duration-frequency (IDF) curve is obtained from the calculation of rainfall intensity by analytical method based on hourly rainfall data and the Mononobe general formula calculation based on daily rainfall data are compared to a constant value in the Mononobe corrected formula. By using the calculation of analytical rainfall intensity as a reference, then analyze the accuracy of the IDF to find the size of the deviation between the calculated rainfall of Mononobe general formula, Mononobe corrected formula and Haspers formula in the calculated of design flood of Rational method. By knowing the relative percentage deviation design flood based on rainfall intensity, it will be known whether the design flood that has been counted overestimated or underestimated.

The results of comparative analysis of the IDF curves at all studied stations on the slopes of Merapi can be seen the under estimated likelihood on Rational method design flood discharge calculation based on rainfall intensity of Mononobe formula. In order to obtain more accurate results then the constant value m = 0.667 should be corrected to m = 0.83. Used Mononobe corrected formula with m = 0.83 for design flood discharge calculation will be obtained more accurate results at 2 and 5 years return period and at two hours or more duration, while the used of Haspers formula would be more accurate at all return periods with two hours or more duration.

Keywords:
IDF curve analysis, design flood, Mononobe constant