ANALISIS KARAKTERISTIK SPASIAL DAN TEMPORAL HUJAN EKSTRIM DI WILAYAH LERENG GUNUNG MERAPI

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ABSTRACT

Rainfall has certain pattern of temporal and spatial characteristics that influenced by the topographic and climatology variations of an area. The characteristics of rainfall are the intensity, duration, depth, and frequency. The combination of high intensity and specific duration of extreme rainfall can be one of significant factors, which trigger the occurrence of lahar flow. This condition caused by the movement of deposit sediment on river system. Lahar flow has potential of disaster because of its high speed and ability to effect massive damage. Accurate information about the characteristics of extreme rainfall on the slopes of Mt. Merapi can be used for the analysis related to sediment disaster mitigation and the warning system of lahar flow hazard.

In case of limited data of short duration recorded rainfall, the intensity-duration relationship can be derived through empirical approach using the formula of Sherman, Kimijima, Haspers, and Mononobe.Furthermore, spatial characteristics analysis of extreme rainfall in the research area can also be done by spatial interpolate which use the method of Inverse Distance Weighted (IDW) with ArcGIS software. Result of the spatial interpolation will illustrate the distribution pattern of rainfall intensity in a particular coverage area.

Result of analysisby using recorded hourly rainfall on the slopes of Mt. Merapi with accuracy indicator value of the Root Mean Square Error (RMSE), shows that 10 of 14 rainfall stations have a tendency of characteristics compatibility with Sherman formula. The temporal and spatial characteristics analysis of rainfall by using selected data according to the rainfall with isolated event for duration of 1 hour on January 1981 – 2010, shows that the characteristics of the distribution pattern of rainfall is relative to the centralized or clustered. The maximum hourly rainfall depth at the center of a rainfall coverage area is 10 mm up to 61 mm with radius of influence area is 250 meters to 5 kilometers. The results of analysis also clearly explain that the center of rainfall coverage area is located in the West and Southwest of Mt. Merapi slopes.

Keywords: Extreme rainfall, rainfall intensity, temporal and spatial characteristics