



INTISARI

Banjir bandang merupakan salah satu bencana hidrometeorologi yang sering terjadi di Indonesia dan menimbulkan dampak kerusakan besar di wilayah dengan topografi curam (>35%). Beberapa faktor utama penyebabnya adalah jumlah/intensitas hujan, pola distribusi hujan dan durasi hujan. Penelitian ini dilakukan untuk memahami karakteristik hujan yang memicu terjadinya banjir bandang di lima wilayah Indonesia, yaitu DAS Sempor di D.I. Yogyakarta, DAS Cimanuk Hulu di Garut, DAS Masamba di Sulawesi Selatan, DAS Lematang Sumatera Selatan, dan DAS Sumber Agung di Malang. Analisis dilakukan menggunakan data curah hujan satelit GPM-IMERG dengan interval 30 menit melalui kajian pola distribusi hujan, rata-rata waktu lama hujan, serta persentase waktu puncak hujan saat banjir bandang. Hasil penelitian menunjukkan kelima wilayah memiliki rata-rata lama hujan antara 180–300 menit dengan pola distribusi yang berpuncak tunggal hingga ganda. Pola ini menegaskan bahwa banjir dipicu oleh konsentrasi curah hujan tinggi, baik berdurasi singkat maupun panjang. Analisis waktu puncak hujan menunjukkan variasi kerentanan hidrologis. DAS Sumber Agung memiliki puncak di awal durasi sebesar 37,5%, yang menyebabkan saat tercapai puncak intensitas yang besar dan tiba-tiba, air hujan tidak sempat terinfiltrasi secara optimal ke dalam tanah sehingga memicu limpasan tiba-tiba dan memperpendek *warning time*. DAS Masamba memiliki puncak di akhir sebesar 78,57%, sedangkan Cimanuk Hulu sebesar 61,54% dan Lematang sebesar 50% memiliki puncak di pertengahan. Pemahaman terhadap pola waktu puncak ini penting sebagai dasar pengembangan sistem peringatan dini berbasis karakteristik hujan lokal.

Kata kunci: Distribusi Hujan, GPM-IMERG , Hujan Satelit, Mitigasi Bencana.



ABSTRACT

Flash floods are a common hydrometeorological disaster in Indonesia, causing significant damage in areas with steep topography. The main contributing factors are rainfall amount/intensity, rainfall distribution patterns, and rainfall duration. This study was conducted to understand the characteristics of rainfall that trigger flash floods in five regions in Indonesia: the Sempor Watershed in Yogyakarta Special Region, the Cimanuk Hulu Watershed in Garut, the Masamba Watershed in South Sulawesi, the Lematang Watershed in South Sumatra, and the Sumber Agung Watershed in Malang. The analysis used GPM-IMERG satellite rainfall data at 30-minute intervals, examining rainfall distribution patterns, average rainfall duration, and the percentage of peak rainfall during flash floods. The results showed that the five regions had an average rainfall duration of between 180 and 300 minutes, with a distribution pattern ranging from single to multiple peaks. This pattern confirms that flooding is triggered by high concentrations of rainfall, both short and long duration. Analysis of the peak rainfall times revealed variations in hydrological vulnerability. The Sumber Agung watershed has a peak at the beginning of its duration of 37,5%, which causes the sudden, large peak intensity to prevent rainwater from optimally infiltrating the soil, triggering sudden runoff and shortening the warning time. The Masamba watershed has a peak at the end of 78,57%, while the Upper Cimanuk is 61,54% and the Lematang is 50% with a peak in the middle. Understanding these peak timing patterns is important as a basis for developing an early warning system based on local rainfall characteristics.

Keywords : *Rainfall Distribution, GPM-IMERG, Satellite Rainfall, Disaster Mitigation.*