INTISARI

PERUBAHAN MORFOLOGI DAN ENDAPAN AWAN PANAS GUNUNG ILE LEWOTOLOK BERDASARKAN DATA SATELIT MODERATE PERIODE JANUARI 2020 – JUNI 2021

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Gunung Ile Lewotolok adalah gunung berapi strato berketinggian 1.423 mdpl yang terletak di Kabupaten Lembata, Provinsi Nusa Tenggara Timur. Ile Lewotolok mengalamai erupsi pada 29 November 2020, pukul 09:45 WITA. Letusan ini mengeluarkan kolom abu setinggi 4.000 meter. Erupsi tersebut menyebabkan perubahan morfologi gunung, seperti terbentuknya kubah lava, aliran lava, dan awan panas guguran. Penelitian berfokus pada pemetaan deformasi permukaan dan analisis evolusi aliran awan panas guguran.

Penelitian ini menggunakan data SAR (*Synthetic Aperture Radar)* satelit Sentinel-1 untuk memantau gunung api yang sering tertutup awan dan vegetasi. Prinsip kerja SAR melibatkan pemancaran gelombang elektromagnetik dan pemantulannya (*backscatter)* dari objek untuk membentuk suatu citra. Kemudian dibandingan dua citra SAR pada waktu yang berbeda untuk memetakan perubahan permukaan. Hasil perbandingan kemudian didelineasi dan divalidasi dengan citra Sentinel-2 dan data aktivitas vulkanik gunung sehingga didapatkan peta zona bahaya awan panas Gunung Ile Lewotolok.

Berdasarkan hasil analisis citra SAR Sentinel-1 bulan Januari 2020 – Juni 2021 terdapat perubahan morfologi puncak Gunung Ile Lewotolok sebelum erupsi berupa pertumbuhan kubah lava, dan setelah erupsi terjadi perubahan pada puncak dan lereng akibat awan panas guguran. Jarak luncur maksimum awan panas guguran mencapai 1,8 km, dengan luas area terdampak kurang lebih 1,4 km^2. Jarak luncur awan panas guguran hasil pemantauan Sentinel-1 tersebut sesuai dengan zona KRB III tahun 2010 dengan radius kurang lebih 2 km.

Kata kunci: Gunung Ile Lewotolok, satelit, Sentinel-1, *SAR*, awan panas

ABSTRACT

CHANGES IN MORPHOLOGY AND PYROCLASTIC FLOW OF MOUNTAIN ILE LEWOTOLOK BASED ON MODERATE SATELLITE DATA FOR THE PERIOD OF JANUARY 2020 - JUNE 2021

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Mount Ile Lewotolok is a stratovolcano located in Lembata Regency, East Nusa Tenggara, with an elevation of 1.423 meters above sea level (masl). It erupted on November 29, 2020 at 9:45 a.m. WITA. The eruption produced 4.000 meters of volcanic plume. The eruption caused morphological changes to the mountain, such as the formation of a lava dome, lava flow, and pyroclastic flow. This study focused on mapping surface deformation and analyzing the evolution of pyroclastic flow.

This study used SAR (Synthetic Aperture Radar) data from the Sentinel-1 satellite to monitor the volcano, which is often obscured by clouds and vegetation. The principle of SAR involves the emission of electromagnetic waves and the reflection (backscatter) from an object to an image. Then, two SAR images from different times are compared to map surface changes. The results of the comparison are then delineated and validated with Sentinel-2 images and volcano activity data to obtain a map of the pyroclastic flow hazard zone for Ile Lewotolok Volcano.

Based on the analysis of Sentinel-1 SAR images from January 2020 to June 2021, there were morphological changes to the crater of Ile Lewotolok Volcano before the eruption in the growth of a lava dome. After the eruption, there were changes to the crater and slope due to pyroclastic flow. The maximum distance of the pyroclastic flow reached 1.8 km, with an affected area of approximately 1.4 km^2. The distance of the pyroclastic flow from the Sentinel-1 monitoring is consistent with the KRB III zone in 2010 with a radius of approximately 2 km.

Keywords: Ile Lewotolok Volcano, Sentinel-1, satelite, SAR, pyroclastic flow.