ABSTRAK

Penelitian ini bertujuan menganalisis tingkat kesiapan fasilitas kesehatan di wilayah rawan erupsi Gunung Raung, Kabupaten Banyuwangi, dengan mengintegrasikan Sistem Informasi Geografis (SIG) dan algoritma K-Means Clustering. Data spasial meliputi batas wilayah, peta zonasi Kawasan Rawan Bencana (KRB), serta koordinat fasilitas kesehatan, sedangkan data atribut mencakup jumlah tenaga medis, ketersediaan IGD, kapasitas tempat tidur, dan jarak ke pusat erupsi. Analisis dilakukan dalam dua tahap, yaitu pemetaan lokasi menggunakan QGIS dan pengelompokan fasilitas ke dalam tiga kategori kesiapan menggunakan K-Means yang ditentukan melalui metode Elbow. Hasil penelitian menunjukkan sebagian besar fasilitas termasuk dalam kategori kesiapan sedang, dua fasilitas berkategori tinggi, dan dua lainnya berkategori rendah. Visualisasi spasial yang dihasilkan mampu menunjukkan distribusi kesiapan berdasarkan jarak dan kapasitas, serta menjadi acuan strategis untuk mitigasi bencana berbasis wilayah. Temuan ini diharapkan membantu pemerintah daerah dan instansi terkait dalam merencanakan peningkatan kapasitas, memperkuat jaringan evakuasi, dan mengoptimalkan respons darurat di wilayah terdampak erupsi Gunung Raung.

Kata kunci: Sistem Informasi Geografis, Kesiapan fasilitas kesehatan, K-Means Clustering, Gunung Raung

ABSTRACT

This study aims to analyze the preparedness level of health facilities in the disaster-prone areas of Mount Raung eruption, Banyuwangi Regency, by integrating Geographic Information Systems (GIS) and the K-Means Clustering algorithm. Spatial data include administrative boundaries, disaster-prone area (KRB) zoning maps, and health facility coordinates, while attribute data comprise the number of medical personnel, emergency department availability, bed capacity, and distance to the eruption center. The analysis was conducted in two stages: mapping facility locations using QGIS and classifying them into three preparedness categories using K-Means, with the optimal cluster number determined through the Elbow Method. The results indicate that most facilities fall into the medium preparedness category, with two facilities classified as high preparedness and two as low preparedness. The spatial visualization effectively illustrates the distribution of preparedness based on distance and capacity, serving as a strategic reference for area-based disaster mitigation. These findings are expected to assist local governments and relevant agencies in capacity enhancement, strengthening evacuation networks, and optimizing emergency responses in Mount Raung's affected areas.

Keywords: Geographic Information System, Health facility preparedness, K-Means Clustering, Mount Raung