

INTISARI

Gunung Api Sinabung sebagai salah satu gunung api aktif di Indonesia pertama kali tercatat erupsi pada tahun 2010. Gunung tersebut masih tercatat aktif dan kerap mengalami erupsi hingga kini. BNPB (Badan Nasional Penanggulangan Bencana) memiliki sistem informasi berisi hasil kajian risiko, kerentanan, bahaya, dan kapasitas bencana di Indonesia. PVMBG (Pusat Vulkanologi dan Mitigasi Bencana Geologi) juga telah menyusun sistem dinamis status kebencanaan geologi di Indonesia. Namun, sistem informasi tersebut belum menyediakan informasi mengenai dampak erupsi Gunung Api Sinabung dilihat dari data bahaya dan kerentanannya maupun menunjukkan visualisasi dampaknya dalam 3D. Kegiatan aplikatif ini melakukan analisis dampak erupsi dan menyajikan hasilnya dalam *dashboard* yang terdiri dari grafik dan *webmap* 3D.

Analisis dampak dilakukan berdasarkan data bahaya berupa sebaran awan panas dan Kawasan Rawan Bencana, dengan data keterpaparan meliputi bangunan, jalan, tutupan lahan, dan populasi terdampak, serta data agregasi sebagai batas kecamatan. Analisis dilakukan dengan *plugin* InaSAFE. Analisis ini menghitung jumlah objek terpapar dan bantuan yang dibutuhkan berdasarkan peraturan pemerintah maupun standar internasional. Hasil analisis lalu divisualisasikan dengan *webmap* interaktif menggunakan Mapbox Studio dan *dashboard* dengan Tableau Public.

Analisis yang dilakukan menghasilkan angka dampak di sekitar Gunung Api Sinabung berdasarkan masing-masing data bahaya dan data keterpaparan. *Webmap* berisi visualisasi geometris kawasan terdampak, sedangkan *dashboard* berisi grafik objek terdampak erupsi Gunung Api Sinabung yang interaktif sehingga pengguna bisa melakukan *filter* data. Visualisasi tersebut ditampilkan dalam *web* yang dapat diakses pada alamat <https://sinabungimpact.000webhostapp.com/>. Dari hasil evaluasi usability menunjukkan bahwa *web* berada di tingkat 82,21% untuk keseluruhan indikator *effective*, *efficient*, *easy to learn*, *error tolerant*, dan *engaging*. Pihak BPBD (Badan Penanggulangan Bencana Daerah) Kabupaten Karo juga merasa bahwa *webmap* ini sangat berguna untuk keperluan mitigasi.

Kata kunci: Gunung Api Sinabung, analisis dampak, peta 3D, *dashboard*.

ABSTRACT

Mount Sinabung as one of the active volcanoes in Indonesia erupted for the first time in 2010. The volcano is still active and frequently erupting until today. The BNPB (National Disaster Mitigation Agency) has an information system presenting the result of disaster risk, vulnerability, hazard, and capacity studies in Indonesia. The PVMBG (Volcanology and Geological Disaster Mitigation Center) has also developed a dynamic system of the geological disaster status in Indonesia. However, the information system has not yet provided information about the impacts of the eruptions of Mount Sinabung based on the hazard and vulnerability data as well as showed the visualization of the impacts in a 3D presentation. This activity was carried out to analyze the impacts of the eruptions and to present the results in dashboards consisting of charts and 3D webmaps.

The impact analysis was conducted based on the hazard data, namely the spread of the hot clouds and the disaster-prone areas with the exposure data of the affected buildings, roads, land cover, and population, as well as the aggregation data as district boundaries. The analysis was done using the InaSAFE plugin. This analysis calculated the number of the objects exposed and the aids needed based on the respective government regulations and international standards. The results of the analysis were then visualized using interactive webmaps with Mapbox Studio and dashboards with Tableau Public.

The analysis resulted in the impact figures around Mount Sinabung based on the respective hazard and exposure data. The webmap contains the geometric visualizations of the affected area. The dashboard contains the interactive graphics of the objects affected by the eruptions of Mount Sinabung, so users can filter the data. The visualization is presented on a web, which can be accessed at <https://sinabungimpact.000webhostapp.com/>. The results of the usability evaluation show that the web is at the level of 82.21% for the overall effective, efficient, easy to learn, error tolerant, and engaging indicators. The Karo Regency BPBD (Disaster Mitigation Agency) also considers this webmap is very useful for mitigation purposes.

Keywords: Sinabung Volcano, Impact Analysis, 3D Map, dashboard.