Remote Sensing Imagery and GIS for Monitoring the Pyroclastic Material of Mount Sinabung

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Abstract. The purpose of this study is to determine the extent of changes in land cover around the Mount Sinabung area after the 2009-2019 eruption by monitoring through remote sensing imagery and GIS. The method used in the research is descriptive quantitative. Data collection was made using document study techniques by collecting Landsat images, which are among the most widely used satellite remote sensing data, with their spectral, spatial and temporal resolution making them useful input for mapping and planning projects (Sadidy et al. 1981). Changes in land cover that occurred around the Mount Sinabung area were dominated by pyroclastic material following the eruption. In addition, changes also occurred due to the abandonment of potential land; for example, local residents working in the plantation sector were forced to leave, so the land was eventually taken over by shrubs. The direction of the dominant pyroclastic material slides was towards the east-south and southeast of Mount Sinabung, areas dominated by the plantation sector. The impacts of the eruption of the mountain were direct and indirect. In 2010, total land cover changes due to pyroclastic material affected an area of 26.27 Ha; in 2014 475.82 Ha were affected; 1339.75 Ha in 2017; and 1196.11 Ha in 2019.

Keywords: Remote Sensing, Land Cover, Pyroclastic Material, Landsat

1. Introduction

Indonesia has the most active volcanoes in the world, with around 30% located in the country. The tectonic setting of Indonesia, which is generated by the interactions between the Eurasia plate in the north, the India-Australian plate in the south, and the Pacific plate in the east, is the reason for
The data collected in the study showed that the new treatment method was effective in reducing symptoms. The results indicated a significant improvement in patient satisfaction compared to the traditional method. Moreover, the new method was found to be more cost-effective, with lower medication costs and fewer side effects. The study also highlighted the importance of regular follow-up and monitoring, which can help in early detection and timely intervention.

In conclusion, the new treatment method appears to be a promising approach for managing the condition. Further research is needed to validate these findings and to explore potential long-term effects. The implications of these results suggest that healthcare providers should consider incorporating this new method into their treatment protocols.