

ABSTRAK

ANALISIS PERSEBARAN LITOLOGI BATUAN GUNUNG API PURBA BERDASARKAN METODE GRAVITASI DI KABUPATEN WONOGIRI, JAWA TENGAH

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Di Indonesia, gunung api dan hasil kegiatannya yang berupa batuan gunung api tersebar melimpah baik di darat maupun di laut. Salah satunya yaitu Gunungapi purba Gajahmungkur di Pegunungan Selatan, Kabupaten Wonogiri dimana Gunungapi purba Gajahmungkur dibangun oleh batuan gunung api produk fase pembangunan dan penghancuran selama kurun waktu Oligosen Akhir – awal Miosen Tengah. Namun, sejauh ini penelitian mengenai gunung api hanya berdasarkan geologi saja, penelitian mengenai kondisi bawah permukaan untuk mengetahui litologi batuan berupa intrusi sebagai penciri fasies sentral vulkanisme Gunungapi purba pada Daerah Wonogiri menggunakan metode geofisika belum banyak dilakukan. Metode geofisika yang dapat digunakan untuk mengidentifikasi kondisi bawah permukaan Gunungapi purba adalah Metode Gravitasi. Penelitian dilakukan analisis persebaran litologi batuan gunung api purba pada Kabupaten Wonogiri, Jawa Tengah berdasarkan metode gravitasi sehingga dapat diketahui fasies sentral Gunungapi purba. Dari hasil penelitian didapatkan persebaran nilai anomali tinggi peta residual yang dapat diduga oleh adanya bagian tubuh gunungapi purba yang menjadi aktivitas magmatisme di masa lampau. Peta anomali residual memiliki nilai persebaran anomali rendah dengan nilai $-11.486 \text{ mGal} - (-7.007) \text{ mGal}$, anomali sedang dengan nilai $-5.583 \text{ mGal} - 4.074 \text{ mGal}$, anomali tinggi dengan nilai 5.594 mGal hingga 13.053 mGal yang diduga sebagai adanya intrusi pada daerah penelitian. Pemodelan 2,5D dimana terdapat pendugaan adanya pusat gunungapi purba sebagai fasies sentral dari gunungapi purba tersebut, litologi batuan intrusi, *cryptodome* aliran lava, dan aglomerat. Intrusi dan batuan pada formasi mandalika yang memiliki nilai densitas masing-masing $2.09-3.17 \text{ gr/cm}^3$ dan $2.4 - 2.8 \text{ gr/cm}^3$. Didukung adanya struktur berupa sesar berpola radier memberikan gambaran tepi pusat tubuh gunungapi purba.

Kata Kunci: Metode Gravitasi, Gunungapi Purba, Fasies sentral, Intrusi.

ABSTRACT

ANALYSIS OF THE LITHOLOGICAL DISTRIBUTION OF ANCIENT VOLCANO ROCKS BASED ON THE GRAVITY METHOD IN WONOGIRI DISTRICT, CENTRAL JAVA

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In Indonesia, volcanic mountains and their resulting volcanic rock are abundant both on land and underwater. One of these is the ancient volcano Gajahmungkur in the Southern Mountains of Wonogiri Regency. Gajahmungkur volcano was constructed from volcanic rock products during the development and destruction phases from the Late Oligocene to the early Middle Miocene. However, research on volcanoes in this region has so far been limited to geological studies, with little investigation into subsurface conditions to identify rock lithology, such as intrusive features that characterize the central facies of ancient volcanism in the Wonogiri area using geophysical methods. One geophysical method that can be employed to identify subsurface conditions of the ancient Gajahmungkur volcano is the Gravimetric Method. Research was conducted to analyze the distribution of ancient volcanic rock lithology in Wonogiri Regency, Central Java, based on gravimetric methods, aiming to ascertain the central facies of the ancient Gajahmungkur volcano. The research revealed a distribution of high anomaly values in the residual map, indicating the presence of ancient volcanic bodies that were active during past magmatic activities. The residual anomaly map showed low anomaly values ranging from -11.486 mGal to -7.007 mGal, moderate anomalies from -5.583 mGal to 4.074 mGal, and high anomalies from 5.594 mGal to 13.053 mGal, suspected to be intrusions within the study area. A 2.5D modeling approach provided estimations of the central volcano center as the central facies of the ancient volcano, including lithologies of intrusive rocks, cryptodome lava flows, and agglomerates. Intrusions and rocks in the mandalika formation exhibited respective density values of 2.09-3.17 g/cm³ and 2.4-2.8 g/cm³. Additionally, evidence of radial fault structures suggests the edges of the central body of the ancient volcano.

Keywords: Gravity Method, Ancient Volcanoes, Central Zone, Intrusion.