

## INTISARI

### IDENTIFIKASI STRUKTUR GEOLOGI PADA ZONA PEGUNUNGAN SELATAN JAWA BAGIAN BARAT BERDASARKAN DATA GRAVITASI

Alfian Romadhoni

11/316738/PA/13865

Interaksi konvergen antara lempeng Indo-Australia dengan lempeng Eurasia menyebabkan terbentuknya sesar-sesar lokal di kerak. Beberapa sesar tersebut terdapat di zona Pegunungan Selatan Jawa bagian Barat dan menjadi sebuah potensi ancaman bencana di masa yang akan datang. Gempabumi yang terjadi pada 27 Mei 2006 pukul 05.55 WIB selama 55 detik telah memporak-porandakan wilayah Daerah Istimewa Yogyakarta dan sekitarnya. Berdasarkan laporan BAPPENAS (2006), gempabumi 27 Mei 2006 menyebabkan 5,700 orang meninggal, 40,000 orang mengalami luka-luka, lebih dari 1,000,000 orang kehilangan tempat tinggal, dan kerugian material ditaksir tak kurang dari 20 triliun rupiah.

Penelitian menggunakan metode gravitasi dilakukan untuk mendapatkan informasi tambahan terkait keberadaan struktur sesar yang belum terpetakan keberadaannya. Pengambilan data dilakukan pada bulan Agustus hingga November 2015, dengan luas area  $15 \times 25 \text{ km}^2$ , dan total titik pengukuran sebanyak 332 titik. Data mentah diolah hingga didapatkan nilai anomali Bouguer lengkap di topografi. Anomali Bouguer lengkap di topografi kemudian diproyeksikan ke suatu bidang datar menggunakan metode ekuivalen titik massa. Anomali Bouguer lengkap di bidang datar kemudian ditapis menggunakan metode rerata bergerak sehingga didapat anomali regional. Anomali regional selanjutnya dianalisis menggunakan analisis *second vertical derivative* untuk menentukan batas dan jenis struktur.

Berdasarkan analisis *second vertical derivative*, pada daerah penelitian terdapat delapan sesar yang seluruhnya diduga memiliki *dip* yang mendekati  $90^\circ$ . Enam sesar berdasarkan analisis SVD berkorelasi dengan sesar yang dipetakan oleh peneliti terdahulu.

**Kata kunci :** metode gravitasi, Pegunungan Selatan Jawa, sesar, gempabumi, SVD

## ABSTRACT

### *GEOLOGICAL STRUCTURE IDENTIFICATION AT THE WESTERN PART OF JAVA SOUTHERN MOUNTAIN ZONE FROM GRAVITATIONAL DATA*

Alfian Romadhoni

11/316738/PA/13865

Convergent interaction between Indo-Australia and Eurasian plate has caused the generation of local faults on the crust. These faults are also located at the western part of Java Southern Mountain and become a earthquake hazard in the future. Earthquake on May 27<sup>th</sup> 2006, 05.55 am WIB for 55 seconds had destroyed Yogyakarta and its surrounding areas. Data from BAPPENAS report in 2006, the earthquake caused 168000 people killed, 40000 injured, more than a million people lost their houses, and the financial lost was more than 20 quintillion Rupiahs.

This research is using gravitational method to get the additional information for the existence of structural fault which has not been investigated by previous studies. The data acquisition was done from August until November 2015 within area of 15x25 km<sup>2</sup> and total measurement points of 332. Raw data is processed to get the value of complete Bouguer anomaly in topography. Then the complete Bouguer anomaly in topography is projected to a surface using point mass equivalent method. Then it is filtered by moving average method to get regional anomaly. After that, regional anomaly is analyzed using Second Vertical Derivative (SVD) analysis to define the structural types and boundaries.

Based on SVD analysis, there are eight faults at the study site. All of them is expected to have nearly 90° dip. Beside, among those eight faults there are six faults which have correlation with the fault investigated by previous studies.

**Keywords :** earthquake, fault, gravity method, Java Southern Mountain, SVD