BOUGUER GRAVITY FIELD OVER BANDARAWELA, ITS CORRELATION WITH GEOLOGY

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Bouguer gravity anomaly maps reveal density variations in the Earth that are usually associated with geological discontinuities such as igneous intrusions, sedimentary basins and brittle faults. According to the basement Geology of Sri Lanka, Contains 90% of Precambrian metamorphic rocks. In this study, investigated the Bouguer gravity anomaly over Bandarawela area with geographical coordinates ranging from 6° 47′ 0″ N to 6° 53′ 0″ N and from 80° 58′ 0″ E to 81° 02′ 0″ E, which consists of approximately 70 Km^2. The study area mainly consists of metasediments and falls. Here present the resultant Bouguer gravity anomaly and correlation with underlying geology. Gravity survey was conducted using CG6 relative gravity meter. The gravity survey was conducted under designed loops and gravity values were obtained. The gravity values were computed utilizing raw gravimeter readings. Oasis Montaj Software was used for data reductions; computes all the necessary corrections to the ideal earth model gravity. In addition, it made the conversion from gravimeter readings to observed gravity with the earth tide and instrument drift corrections. Bouguer anomaly map was created by ArcMap software. The reproduced geology map of the area using the geology map published by the Geological Survey and Mines Bureau was correlated with the produced gravity anomaly map. The gravity anomaly map shows a minimum value -154.83 mGal, and maximum value –6.98 mGal. The Bouguer anomaly shows a distinct gravity high in the SW part of the study area. It shows a sharp linear gravity variation in one end and a gradual variation in the other end with the surrounding rock mass. The Bouguer gravity variation divides the underlying rocks into three distinguishable gravity regions; gravity anomaly high: -59.744 mGal to –6.985 mGal., medium: –106.705 mGal to –59.744 mGal, low: –154.825 mGal to –106.705 mGal. The underlying rocks consist of lithologies such as charnockitic gneiss, garnet-sillimanite-biotite gneiss graphite, khondaite, marble and quartzite. Those rocks are folded by refolded parallel synforms and antiforms which are imprinted by several shear zones. The gravity high is underlying by a metasedimentary sequence dominated by Garnet-sillimanite-biotite gneiss graphite, khondalite and garnetiferous quatzofeldspathic gneiss. The gravity low is underlying by a metasedimentary sequence dominated by khondalite, calc gneiss and marble while the gravity medium is underlying by a metasedimentary sequence dominated by charnockitic gneiss, walawe gneisses and garnetiferous quatzofeldspathic gneiss.The distribution of Bouguer anomaly does not correlated with the fold structures in the area. In addition, the shear zones indicated in the geology may is unlikely due to brittle faults. It is evident that a set of sequence of metamorphic rocks altogether define density variations. Such information is important in understanding gravity variation in this kind of Precambrian metamorphic terrains.

Keywords: *Bouguer anomaly, Density, Geology, Gravity*