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Identifying geothermal potential sites in Jaboi Field, Sabang using satellite data

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This study integrates various datasets to identify and map geothermal potential in Jaboi field, Sabang. Three datasets were used in this study: satellite imageries, geophysical resistivity data and ground temperature measurement. Landsat 8 and PALSAR DEM were used in this study. Land Surface Temperature (LST) and land cover were obtained from Landsat 8, while lineament and surface drainage were obtained from PALSAR DEM. Various information were overlaid on a single map and analyzed to observe features of interest i.e. LST, hot spring location, fault lines, lineaments and surface drainage. In addition, geophysical resistivity survey, VES 1-D method with Wenner array, was carried out with a total of 51 points scattered across the study area. The technique images resistivity values of different depth at one point, in this case at 250 m, 500 m, 750 m and 1000 m. Lastly, ground temperature measurement was acquired using needle probe temperature device with a total of 114 points distributed evenly around the survey area. The device is equipped with Arduino Uno as its microcontroller board and 5 pieces of temperature sensors mounted on a 2 meters iron rod. Additional information was used from geological map that was acquired from the Geological Research and Development Centre. All datasets were integrated mapping 4 areas which were considered to have geothermal potential. However, these areas vary in term of the clustering of the features of interest, such as high surface temperature, lineament and drainage density, fault existence, hot spring existence and the low resistivity subsurface. With all these criteria taken into consideration, ranking for potential area were made to decide which area has higher potential.

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