

**UTILIZATION OF NON-ELECTRIC GEOTHERMAL HEAT FOR DRYING
COFFEE BEANS BASED ON THEIR CHARACTERISTICS IN GEDONG
SONGO TEMPLE, TEMPLE VILLAGE, BANDUNGAN DISTRICT,
SEMARANG REGENCY, PROVINCE OF CENTRAL JAVA**

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ABSTRACT

The research area has geothermal manifestations in the form of hot springs with most of the population doing agriculture, including coffee farmers. Coffee beans to be consumed require a drying process. Drying using hot springs will produce no emissions and there is no worry about the weather. The research area has high rainfall. The research was conducted at Gedong Songo Temple, Candi Village, Bandungan District, Semarang Regency, Central Java Province. The purpose of this study was to determine the characteristics and potential of springs for drying coffee beans in Candi Village.

This type of research uses a combination of qualitative and quantitative types. The methods used in this research are surveys and field mapping, laboratory tests, analysis and experiments. Laboratory tests in the form of water geochemical tests and rock incision tests (petrography). The analytical method is to determine the characteristics and proportions of hot springs. Analysis of the characteristics of hot springs with the geochemical analysis method of water using triangular diagrams Cl-HCO₃-SO₄ and petrographic incisions. Analysis of the potential of hot springs is predicting the reservoir temperature using the Na/K geothermometer method, knowing the fluid balance of geothermal water using the Na-K-Mg diagram method, knowing the quantity (discharge) of the springs and the quality of the hot springs.

The results of the research on the characteristics of geothermal springs have a sulfate (SO₄) type which indicates an upflow zone, based on a thin slice of rock undergoing alteration. The potential of hot springs is based on the physical quality of hot springs, which has a temperature of 63 °C, a slight sulfuric smell, tasteless, and yellowish in color, with a TDS of 939 mg/L. The spring discharge is 0.325 l/s. Fluid equilibrium is in the immature water zone. Estimated temperature is 354 °C, including high enthalpy geothermal systems (>225 °C). So that the hot springs in the research area can be used directly or indirectly. Directions for the development of the use of hot springs in the form of a coffee bean drying device design. The experimental results show that the design of the coffee bean drying machine has a capacity of 100 kg with a processing time of 3 hours. Based on the technique, the design of the dryer consists of a pond, a coffee bean drying plate and an outlet through the greenhouse.

Keywords: Geothermometer, Manifestation, Hot Springs, Drying, Potency, Coffee Beans, Drying