

**ANALYSIS OF THE OPERATIONAL PERFORMANCE OF THE
MICROHYDRO POWER PLANT (MHPP) IN SUMBERPOH VILLAGE,
MARON DISTRICT, PROBOLINGGO REGENCY**

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ABSTRACT

The Sumberpoh Village Micro Hydropower Plant (MHPP) utilizes the flow of the Sebaung River as a renewable source of electrical energy. Following the replacement of the generator specifications, an evaluation of the plant's performance was required to obtain data that accurately reflect its current operating conditions. This study aimed to evaluate the performance of the MHPP based on water power potential, generator electrical output, energy conversion efficiency, and power utilization within the distribution system. A quantitative approach was employed through direct field measurements using a current meter, an automatic level waterpass, and a clamp meter, with a total of 14 measurement sessions. The results indicated a water discharge of 0.2131 m³/s and an effective head of 5.78 m, producing a hydraulic power of 12.1 kW and a theoretical electrical power potential of 5.1 kW. The actual electrical power generated was 3.81 kW, with an overall system efficiency of 74.75%, indicating that the energy conversion process was operating effectively. However, the 40kW synchronous generator was still operating under underloaded conditions because the consumer load was only 1.30 kW. In addition, the output frequency of 47 Hz indicated that the generator had not yet reached a stable synchronous speed. Therefore, optimization of the hydraulic system and increased utilization of the generating capacity through load expansion and distribution network development are recommended.

Keywords: *Electrical Power, Generator, Micro Hydropower Plant (MHPP), System Efficiency, Water Discharge.*

