

# **DESIGN AND CONSTRUCTION OF MICRO HYDRO POWER PLANTS AS ALTERNATIVE POWER SUPPLY FOR AQUARIUM PUMPS**

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## **ABSTRACT**

*In this modern era, the need for electrical energy continues to increase along with the development of technology and human population. Conventional energy sources such as fossil fuels are increasingly depleted and have a negative impact on the environment. Therefore, alternative energy sources that are environmentally friendly and sustainable are needed. One potential solution is the utilization of water energy through micro hydro power plants (PLTMH). This technology utilizes water flow as an energy source to generate electricity and has advantages such as being environmentally friendly and low operational costs. PLTMH can be used to meet small-scale electricity needs, including aquarium pumps, which are important for water circulation and oxygenation in aquariums. This study involved the design and testing of a PLTMH system that uses a DC generator to generate electricity from the flow of water in an aquarium filter. The power generated is stored in a battery and used to power the aquarium pump through an inverter when a power outage occurs. The results of this study in the first test, it was found that the system experienced a significant decrease in performance, with an initial voltage of 12.84V which gradually decreased to 11.15V, indicating a decrease in battery capacity. The decrease in current from 0.00984A to 0.00722A, and the decrease in power from 0.12635W to 0.0805W, indicate a decrease in the efficiency of the system in providing energy. The second test showed a relatively stable voltage between 11.49V to 11.59V, although the current and power tended to fluctuate. The third test showed an increase in current and power when using electricity from PLN, but there was a decrease when switching to batteries due to power outages. The falling water design proved to be more efficient in generating power compared to the flowing water design, with a higher power between 124.08 mW to 134.439 mW, making it a more optimal choice for systems that require higher power output.*

**Keywords:** *Micro Hydro Power Plant, Renewable Energy, Alternative Power Supply, Aquarium Pump, Energy Efficiency*