ABSTRAK

Energi fosil masih mendominasi konsumsi di Indonesia, namun keterbatasan cadangan dan dampak negatifnya bagi lingkungan mendorong perlunya pengembangan energi terbarukan. Terutama energi air yang memiliki potensi besar di Indonesia, dengan potensi diperkirakan sebesar 75,67 GW. Salah satu lokasi yang berpotensi dikembangkan sebagai Pembangkit Listrik Tenaga Mikrohidro (PLTMH) berbasis *screw turbine* adalah irigasi tambak Dipasena Kabupaten Tulang Bawang. Penelitian ini bertujuan untuk mengetahui potensi energi air, potensi energi yang dapat dibangkitkan, dan menganalisa rancangan PLTMH berbasis *screw turbine* pada saluran irigasi tambak Dipasena. Metode penelitian meliputi pengukuran luas penampang secara langsung, pengukuran kecepatan aliran dengan metode benda apung, pengukuran *head* dengan metode *waterpass*, dan pengolahan data dengan perhitungan serta perancangan *screw turbine* dengan perangkat lunak SolidWorks. Hasil penelitian menunjukkan potensi energi air di lokasi penelitian memiliki debit 1,926 m^3/s, *head* 1,13 m, dan daya hidrolis 21350,28 W. Potensi daya yang dapat dibangkitkan turbin 16021,71 W, dengan efisiensi turbin 75%, dan kecepatan putaran 3267,88 rpm. Hasil perancangan menunjukkan diameter turbin 0,475 m, diameter poros turbin 0,142 m, panjang turbin 2,26 m, sudut ulir 22°, sudut turbin 30°, *pitch* turbin 0,475 m, dan jumlah ulir 4,763 buah.

Kata kunci : Energi terbarukan, PLTMH, *Screw Turbine*, SolidWorks

ABSTRACT

Fossil energy still dominates energy consumption in Indonesia, however limited reserves and its negative environmental impacts necessitate the development of renewable energy sources. Among these, hydropower has significant potential in Indonesia, with an estimated potential of 75.67 GW. One location that has the potential to be developed as a micro-hydropower plant (MHP) based on a screw turbine is the Dipasena aquaculture irrigation system in Tulang Bawang Regency. This study aims to determine the water energy potential, the potential power that can be generated, and to analyze the design of a screw turbine-based MHP in the Dipasena pond irrigation channel. The research methods include direct measurement of the cross-sectional area, flow velocity measurement using the float method, head measurement using a waterpass, and data processing through calculations and screw turbine design using SolidWorks software. The results show that the water energy potential at the study site has a discharge of 1,926 m³/s, a head of 1,13 m, and a hydraulic power of 21350,28 W. The potential power generated by the turbine is 16021,71 W with a turbine efficiency of 75% and a rotational speed of 3267,88 rpm. The design results show a turbine diameter of 0.475 m, a shaft diameter of 0,142 m, a turbine length of 2,26 m, a screw angle of 22°, a turbine angle of 30°, a pitch of 0,475 m, and 4,763 turns.

Keywords : *MHP, Renewable energy, screw turbine,* Solidworks