

Research Project

Redesign and Modeling of a Water Wheel for Decentralized Electrification in Rural Areas in Developing Countries

Background

Despite the continuously increasing access to electricity in rural Himalayan regions, millions of its inhabitants still live without electrical energy, and many more have a very unreliable supply connection. Simultaneously, the geographic region has enormous hydropower potential thanks to its mountainous topography, but only a fraction of this potential has been taken advantage of. The design is simple, cost-effective, and robust, and all individual components of the system are manufactured. The concept basis is a classical overshot waterwheel with a horizontal shaft, ideal for low heads and small volume flows. The modularity of the concept makes it adaptable to different operating conditions, resulting in a broad spectrum of possible power outputs.

This research internship aims to improve the design of the water wheel and provide a tool for modeling the expected power output from simple inputs, such as head height and water flow. The primary objective is to design a complete CAD design of the water wheel and contribute new ideas to the concept. Furthermore, this work seeks to provide a simple calculation tool for the correct sizing of the wheel.

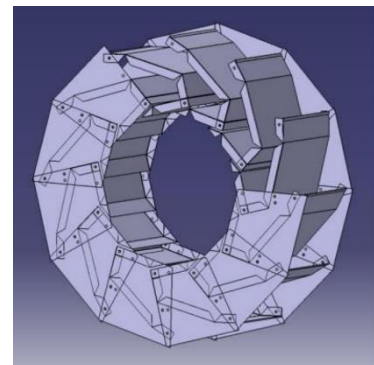


Requirements

- Problem oriented and practical thinking
- Strong interest in technology for developing countries
- CAD design experience and hands on experience

Expected work

- Complete CAD model of the design.
- Implementation of a model of the water wheel.
- Willingness to build and setup a prototype.



Contact

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