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## Science, Technology, Research and Innovation for Development (STRIDE)



### Design, Fabrication, and Evaluation of a Water-Driven S-Turbine Pump

**GRANTEE:** Iloilo Science and Technology University (ISATU)

**PRINCIPAL INVESTIGATOR:** Engr. Salvador Seniorio

**GRANT PERIOD:** September 16, 2016 to September 15, 2017

**CONTRACT AMOUNT:** Php 857,850 (approximately USD18,250)

#### Harnessing the power of water

The Philippines, with 18 major river basins, 421 major rivers, and thousands of creeks and tributaries, is noted for its hydropower potential. This water resource has a huge market potential with the installation of an S-turbine/pump system. Thousands of potential end-users await installation of the S-turbine, particularly in remote and unutilized farmlands with a shortage in water supply.

Hydropower is environment friendly and does not produce hazardous gas emissions or pollutants. It also reduces the cost of agricultural production and power generation because it is renewable, free, and abundant with minimal cost for operations and maintenance. The main drawback is the initial investment in turbine importation, construction, or installation of hydropower plants due to sophisticated turbine designs, fabrication, and operations.



*Engr. Salvador Seniorio explains how the laser cutter is used for fabrication with actual demonstration by a member of the research team*

To address this concern, a team of researchers from ISATU has started the development of less costly yet equally efficient S-turbine with support from USAID STRIDE. The reduction in cost for fabrication is made possible through the adoption and combination of optimum operating principles of the different types of turbines to come up with a new design.

The S-turbine/pump is a hydraulic machine with a corresponding flowrate that pumps water into turbines to generate electricity for hydropower applications.

## Potential application and benefits

With sufficient grant funding, the research work will proceed with the fabrication, installation, testing, and evaluation of a pilot model water-driven S-turbine/pump system to be showcased in a village with the following results.

- Development of a new type of hydraulic turbine that will simply use water power to generate ample electricity in areas where there are available water rapids or streams;
- Reduction in the dependence on fossil fuels for potable water supply and irrigation projects to help address food security; and
- Electrification of homes.

Upon the success of the undertaking, target markets identified as immediate clients are electric and farmer cooperatives, local government units, non-governmental organizations, and communities in remote places.

The project also aims to develop the capacity of the university faculty, staff, and even students in production drawings using computer-aided design (CAD) software to be able to develop simplified fabrication techniques for the complex turbine design.



*Engr. Salvador Senorio and STRIDE representatives talk to farmers of Barangay Cabancanan, Alimodian where the S-Trubine/pump will be installed*