De La Salle University - Dasmariñas

"Evaluation of the Utilization of Utod Falls of Barangay Tua for Power Generation"

This Undergraduate Thesis is Presented
to the Faculty of Mechanical Engineering Department
College of Engineering, Architecture and Technology
De La Salle University –Dasmariñas
Dasmariñas, City

In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science in Mechanical Engineering

Derain, Jhojo T.
Santos, Christopher Lawrence S.
Sugahara, Toshi John B.

23rd APRIL, 2015

ABSTRACT

This research study was conducted to demonstrate the potentials of Utod Falls for Micro Hydro Power Generation and further assess its economic potentials to present how the Site should be best utilized. To do this, the researchers assembled a Micro Hydro Power Generator Prototype using the Gearless Turbine designed by Engr. Wilfredo G. Vidal,PME. The Prototype demonstrated the power generation potentials and capacity of the Utod Falls to the Barangay officials of Brgy. Tua Magallanes, Cavite through the rotation of the turbine. The visibility of the turbine rotation has given the Barangay officials the knowledge about generating electricity by diverting the water current into a PVC pipe which is connected to the turbine. Through series of tests which was done at the small portion of the Downstream of the Utod Falls, the researchers were able to assess the power and economic potential of the Utod Falls and its Downstream for Micro Hydro Power Generation. There were two options considered in evaluating the power and economic potential of Utod Falls, Option 1 uses the Downstream of the Utod Falls for Micro Hydro Power Generation by installing a 2 meter dam while Option 2 uses both the Utod Falls and its Downstream for Micro Hydro Power Generation by installing a Dam on both Upstream and Downstream of the Utod Falls. The Utod Falls has the capacity to generate 19.62 KW of electricity while its Downstream has the capability of producing 4.91 KW. So, by further summarizing, Option 1 can only generate 4.91 KW while Option 2 has the capacity to generate 24.53 KW. Financial viability analysis of the two options shows that option 2 would yield a higher rate of income compared to option 1. Option 1 will yield a rate of income of 14.69% while Option 2 has a rate of income of 20%. Although, having both the Falls and the Downstream for Micro Hydro Power Generation would require more investment, it would harness more power that could provide more electricity to the community, which is good aside from its profitability. In conclusion, Option 2 was the best option since it will yield a greater amount of electricity to be used through certain factors such as Livelihood, Agriculture, Streetlights, etc. without compromising the profit of the investment.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES