

**UNIVERSITI TEKNOLOGI MARA CAWANGAN  
TERENGGANU**



**MEC300**

**Feasibility Study of Small Hydro-Turbine Usage on Free  
Flow Water Drainage for Landscape Lighting**

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## **ABSTRACT**

Sustainability and energy prices make the use of energy obtained from renewable sources on an urban scale and for isolated local facilities necessary for municipal authorities. Moreover, when the demand of energy is at night, as for street lighting installations, the use of accumulative systems is necessary, which means a major drawback due to a short lifetime expectancy and high cost. The objective for this project is to design a mini hydro-turbine station using free-flowing water from drainage for landscape lighting as renewable energy sources that can produce energy throughout the day, especially during the night, at the same time at which it is consumed. As for this project, it will be using the method the water flows as supply network which the water recovery turbines within these installations as an alternative to photovoltaic generators and light up LEDs. As the result, an analysis of functionality was be carried out in term of the brightness of LEDs and the generators provided enough electricity to light LEDs as it also economically decreases the cost for standard generators as the relationship between water flow rate and voltage is fundamental to the project's viability which the generated voltage is directly influenced by the water flow rate, with higher rates leading to increased turbine rotational speed and, consequently, a higher voltage output.

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