CHAPTER 1

INTRODUCTION

1.1 Project Background

Micro-Hydro Generator Systems (MHGS) convert the energy of moving water into electricity. Generator systems convert from mechanical to electrical energy. This project is to develop a Micro-Hydro generator system using battery based system to generate power. The battery based system that we will use is Lead-acid deep cycle batteries. This battery can be charge and discharge system. The prime mover of this project is water that means source of water pressure from a present water tank, pipes and to turn a turbine then the turbine spins an alternator and electricity is produces to charge the battery. Then an alternator converts the mechanical energy from the turbine into electrical energy. Many other components may be in a system, but it all begins with the energy already within the moving water. Other renewable energy source, such as solar and wind, can be used to produce electrical power. The choice of energy source depends

on several factors, including availability, economic and energy and power requirements. Micro hydro power is almost always more cost-effective than any other form of renewable power. Micro hydro designates projects with power output of less than 100 kW. This project is also using a Programmable Interface Controller (PIC) and power electronic components in designing hardware. In the end of the project, the proposed micro hydro-generator will work properly as designed and will produce output power as high as 1kW or more and can be used for lighting, bulk, and battery charger and electronics devices.

1.2 Problem Statements

Hydro generator system in market is huge and high cost and no micro hydro generator in the market.

1.3 Objectives of Project

The objectives of this project are:

i. To produce electricity using renewable source of energy.
ii. To implement the use of Programmable Intelligent Circuit (PIC) and Power Electronics switch in designing hardware.
iii. To provide clean, environmentally friendly electricity in rural communities.

1.4 Scope of project

The scope of this project is:

i. To develop of Micro-Hydro Generator System using automotive alternator.
ii. Using PIC 16F877 microcontroller as a control circuit.
iii. Produce output power at least 500W

1.5 Literature Review

Micro hydro power was once the world's prominent source of mechanical power for manufacturing. Micro hydro is making a comeback for electricity generation in homes. This system of the Micro hydro can be divide by two is Battery base systems and AC- Direct System.[1].

The battery base system is power can be supplied by a micro hydro system in two ways. In a battery-based system, power is generated at a level equal to the average demand and stored in batteries. Batteries can supply power as needed at levels much higher than that generated and during times of low demand the excess can be stored. If enough energy is available from the water, an AC-direct system can generate power as alternating current (AC). This system typically requires a much higher power level than the battery-based system. The input voltage to the batteries in a battery-based system commonly ranges from 12 to 48 Volts DC. If the transmission distance is not great then 12 Volts is often high enough. A 24 Volt system is used if the power level or transmission distance is greater. If all of the loads are inverter-powered the battery voltage is independent of the inverter output voltage and voltages of 48 or 120 may be used to overcome long transmission distances. Although batteries and inverters can be