Renewable Energy for Rural Electrification in Developing Countries (Mozambique)

Supervisor:

Abstract

Rural areas continue to be home to majority of the population in Africa. The importance of providing modern energy to rural areas cannot, therefore, be overemphasized.

Mozambique occupies a territory located on the south-eastern coast of Africa, between the latitudes 10° and 27° south and longitudes 30° and 41° east.

Presently the major energy resource in Mozambique is fuel wood biomass. More than 80% of the energy consumed in the country comes from fuel wood biomass

The energy from the main grid covers only about 7% of the Mozambican population [**Mozambique Energy Sector Strategy, World Bank Report, Department of Energy, Maputo, 1995**]. People outside the grid are mainly those living in rural and in peri urban areas. According to the Power Utility "Electricidade de Moçambique" (EDM) the main grid coverage may not attain the 20% of the population in the next 30 years.

For the majority of rural households in the region, biomass fuels continue to be the dominant fuel of choice. In this document it suggests possible options that could have greater impact on rural clean energy development, these options could be Solar energy photovoltaic, and thermal, wind for pumping water or electricity generate , micro hydropower also for water pumping and electricity generate and biofuels options. These energy options are receiving adequate attention from policy makers and are improving the rural life.

These Renewable Energies can supply reliable, relatively cost-effective electricity for basic needs in developing countries. They can be used to improve the lives of people in many ways, including supplying clean electricity to light homes, hospitals, schools, small shops, and other infrastructures, pumping water, etc. Using the natural resource of wind, sunlight, rivers and Jatropha plants the lives of many people can be improved.

The paper aims to give the present status of major renewable energy technologies developing Mozambique in order to improve the rural electrification.

1. Introduction

Electricity plays a critical role in the development of the world; it has the potential to improve the standard living.

Deployment of RE has been increasing rapidly in recent years. Under most conditions, increasing the share of RE in the energy mix will require policies to stimulate changes in the energy system. Government policy, the declining cost of many RE technologies, changes in the prices of fossil fuels and other factors have supported the continuing increase in the use of RE.

Current estimates indicate that approximately 1.6 Billion of the world's population have no access to electricity and even by 2030 there will be some 1.4 billion people without electricity unless there are dramatic changes in electrification [IEA, World energy outlook 2006: International Energy Agency. ISBN: 92-64-10989-7].
Most of the people without access to electricity live in rural areas of the developing countries.
The challenge is to improve access to modern energy services using renewable energies as wind, solar and hydro power which are appropriated to accommodate the special needs of rural areas in terms of decentralized electricity generation.

1.1 Objectives:

1.1.1 Main objective

The main objective is to study and analyze different options to accommodate the rural electrification in development countries specifically in Mozambique.

1.1.2. Specific Objectives

- ✓ Analyse the actual situation of the electrification in Mozambique;
- ✓ Analyse of different options to consider in terms of energy supplies;
- ✓ Study of the interrelated problems of energy and the environment;
- ✓ Analyze the socio-economic and environmental issues linked with the use of renewable energy supply systems, including policy issues and gender matters;
- ✓ Adoption of an energy model;
- ✓ Implementation of Hybrid system as a option for rural electrification in Mozambique;

1.2. METHODOLOGY

The methodology that will be used to this these

1.2.1. Literature Review

The thesis will be basically supported by research to improve the understanding of the rural electrification based on renewable energy technologies.

1.2.2. Data Collection

Collection of local data will be based on several site visits in rural areas of Mozambique as well as visits in some institutions or organizations that are direct involved in the process of rural electrification of the country for process study and understanding.

1.2.3 Stakeholders surveys

This will require development of a suitable questionnaire for information collection where feasible interviews with key policymakers will be encouraged.