

**EXPLORING THE ROLE OF THE CLEAN  
DEVELOPMENT MECHANISM IN PROMOTING  
ACCESS TO CLEAN RENEWABLE ENERGY  
IN UGANDA**

**By**



**BBOSA HENRY**

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## DECLARATION

I, Bbosa Henry, Registration number BU/GS15/MCC/20 hereby declare that the work presented in this dissertation is original and has not been submitted for award of a degree or published at any university.

Signature: .....

Date: .....

30/9/2018

Bbosa Henry

(Student)

This dissertation has been produced under my supervision and submitted with my approval.

Signature: .....

Date: .....

30/09/2018

Dr. Alice Nakiyemba

Dean, Faculty of Natural Resources and Environmental Sciences

Senior Lecturer, Department of Natural Resources,

Busitema University

(Supervisor)



Signature: .....

Date: .....

29/9/2018

Eng. Dr. Adam M. Sebbit

Senior Lecturer, Department of Mechanical Engineering,

Makerere University Kampala

(Supervisor)

## DEDICATION

This work is dedicated to my dear parents Dr. Kamwaka Edward and Mrs. Nalongo Alex Luyiga. To my brothers: William Kiyangi, Ally Winston, Kyobe Cartwright, Andrew Kibuuka, Sisters: Ritah Nalugwa Sarah Nakiyingi, Alice Nassuna Nalugya Besmeth, Nakibuuka Juliet, , Nalwanga Lydia, and Samalie Kiwanuka. To the families of Festus Bamutye-Kampala, Nyanama Okuraja Charles Esimu-Serere District; Chebet Maikut-Kapchorwa District; Christopher Senteza Kalyango-Gayaza, Bulamu, and to you my dearest Paula and Alice Bbosa.

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## Acronyms

CDM	Clean Development Mechanism
CERs	Certified Emission Reductions
ERA	Electricity Regulatory Authority
GHG	Greenhouse Gas
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
LPG	Liquefied Petroleum Gas
MEMD	Ministry of Energy and Mineral Development
MFPEd	Ministry of Finance, Economic Planning and Development
MW	Megawatts
NAMA	Nationally Appropriate Mitigation Action
NDC	Nationally Determined Contributions
NDP	National Development Plan
NFA	National Forestry Authority
PFCC	Parliamentary Forum on Climate Change
PoA	Programme of Activities
SE4All	Sustainable Energy for All
UBOS	Uganda Bureau of Statistics
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organisation

## **Definition of Key Terms**

### **Energy**

Energy is referred to in the study as the scalar physical property that enables physical systems to perform work through the operations that the given systems are designed to undertake. Energy exists in several forms such as heat, kinetic or mechanical energy, light, potential energy, magnetic energy and electrical energy.

### **Clean energy**

Clean energy is understood in the study as energy that is generated from sources and through processes that do not create or that create fewer and lesser polluting impacts to the environment.

### **Renewable energy**

This is used to mean energy that is collected from resources which are naturally replenished on a human timescale, such as sunlight, wind, rain, tides, waves, and geothermal heat.

### **Energy access**

This is the ability of households and other public and private entities to reliably and affordably obtain a basic level of electricity and a relatively clean, safe means of cooking. It describes the ease with which households and other entities can get the energy that is technically available, adequate, reliable, convenient, safe and affordable.

### **Clean Development Mechanism**

The Clean Development Mechanism is a carbon trading system which was established by the Kyoto Protocol as a tool for enabling developed countries to fund activities that cut greenhouse gas emissions in developing countries. It is designed to offer industrialized countries an efficient market mechanism to achieve some of their emissions reduction obligations at a lower cost by installing green technology in developing countries. CDM is known to be the world's main carbon credit scheme.

### **Emissions**

Emissions consist of the gases and particles which are put into the atmosphere or emitted by various sources.

## **Greenhouse Gases**

Greenhouse gases are gaseous compounds in the atmosphere that are capable of absorbing infrared radiation, thereby trapping and holding heat in the atmosphere. Because they increase the heat in the atmosphere, greenhouse gases are known to be a cause of the greenhouse effect, which ultimately causes global warming. The primary greenhouse gases in Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.

## **Emissions reduction**

Emissions reduction is the deliberate endeavor to undertake measures for cutting or lowering the amounts of greenhouse gases emitted into the atmosphere from human activities.

## **Market-based approaches/tools**

These are approaches and tools for emissions reduction that use principles of markets and trading to control emission of greenhouse gases into the atmosphere by providing economic incentives for achieving reductions in the emissions of pollutants. They are government-mandated cap and trade schemes which are based on flexible environmental regulation that allows organizations to decide how best to meet policy targets. Cap and trade approaches and tools are based on credits that pay for or offset GHG reductions and are majorly meant to provide the private sector with the flexibility required to reduce emissions while stimulating technological innovation and economic growth.

## **CDM project**

CDM projects consist of emissions reduction projects which generate Certified Emission Reduction units (CERs) which may be traded in emissions trading schemes. They include projects which generate clean and renewable energy such as wind farm projects and hydro power projects; projects which reduce emissions by using fossil fuel alternatives such as biogas projects, landfill gas to electricity projects and projects which avoid emissions through better treatment of waste such as composting projects and the sequestration of carbon through forestry sinks.

## **CDM Programme of Activities**

This is a programmatic modality of project development under the Clean Development Mechanism (CDM) through which replicable emission reducing projects with low and physically spread Greenhouse Gas reductions are bundled together and entered as an aggregate group of emissions reduction activities into the CDM framework. Programmes of Activities include projects that distribute compact fluorescent lamps, efficient cook-stoves, building refurbishment or solar water heaters; small hydro power plants; composting, among others.

## ABSTRACT

Access to and utilization of clean renewable energy remains low in Uganda where the impacts of climate change are expected to exacerbate energy insecurity-related problems. Thus, the country joined the rest of the world in attempting to use market-based approaches and tools such as the Clean Development Mechanism to motivate and incentivize the development of clean renewable energy. This cross-sectional descriptive study undertook to explore the actual impact that the CDM framework has had on energy development in the country. The data, which were collected through questionnaire-based interviews, revealed the impact of CDM as being positive in spurring the development of projects that sought to address energy insecurity in Uganda and a range of challenges and risks that are inherent in the use of CDM and other market-based approaches in the country, as well as the interventions that need to be undertaken to make these approaches more effective for the country.

# CHAPTER ONE

## INTRODUCTION AND BACKGROUND

### 1.0 Introduction

This report presents a research that was conducted to assess the role and impact that CDM has had in the development of clean and renewable energy in Uganda as a means for promoting the reduction of greenhouse gas emissions, addressing energy security challenges that the country is facing and generating other environmental, economic, social development benefits and resilience outcomes in the face of climate change.

Uganda has put in place energy policies which aim to promote the use of modern, clean and energy efficient technologies to provide renewable sources of energy. However, despite possessing a huge overall renewable energy power generation potential estimated to be about 5,300 MW (ERA, 2013; energypedia, 2017), the production, distribution, access to and use of this form of energy is still minimal as wind, solar and geothermal energy remain underdeveloped. The country's energy matrix therefore continues to be dominated by biomass-based energy sources, which contribute about 95% to the total primary energy consumption, with electricity and petroleum products contributing 4% and 1 % respectively (UBOS, 2016). More than 90% of the population depends on non-sustainable charcoal and firewood as the primary source of cooking fuel. Developing and harnessing of the country's renewable energy potential is still demanding if the country's energy needs are to be met. This requires a huge investment in funding for the country to achieve her policy goal of increasing the use of modern renewable energy sources from the current 4% to 61% by 2030 (MEMD, 2011).

The Clean Development Mechanism (CDM), which is a flexible mechanism of the Kyoto Protocol, is one of the tools that were conceived to address the kind of the challenge of huge deficits that most developing countries face in funding emissions reduction and sustainability, by providing an incentive for actors to invest in projects that reduce greenhouse gases and contribute to the sustainable development. The CDM incentivizes investment in low-carbon development projects by availing project developers the opportunity to obtain carbon finance through rewards in form of Certified Emission Reductions (CERs) which are issued for projects that reduce or avoid greenhouse gas emissions and contribute to sustainable development. Uganda has been known to possess enormous potential to exploit opportunities under the CDM in the areas of energy, transport, forestry, agriculture and waste management among other areas.

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