CONSTRUCTION OF A SOLAR CONCENTRATOR FOR USE IN NAGONGERA SUBCOUNTY- TORORO DISTRICT.

BY

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BU/UP/2019/3214

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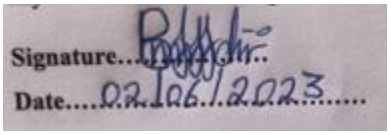
A PROJECT REPORT SUBMITED TO THE DEPARTMENT OF PHYSICS AT THE FACULTY OF SCIENCE AND EDUCATION IN PARTIAL FULFILMENT OF THE REQUREMENTS FOR THE AWARD OF A BACHELORS DEGREE IN SCIENCE AND EDUCATION AT BUSITEMA UNIVERSITY.

JANUARY, 2023

DECLARATION

I **Lutaaya Badru** hereby declare that this project report is my original work with exception from quotations and literature review. I strongly affirm that this project has never been submitted to any institution of higher learning for any academic award.



LUTAAYA BADRU

APPROVAL

This project report on design and construction of a parabolic solar cooker by Lutaaya Badru has been produced under my supervision and approval and is worthy for examination.

Signature ..... **date**.....02/06/2023.....

DR. ANGELA KARORO

DEDICATION

I dedicate this book to my beloved parents Mr. Muganga Badru and Mrs. Nagudi Miriam for the grateful work they have done for me. Its my pleasure to thank them for the so much efforts and support they gave me to see my success. May the Almighty Allah shower them with his bounties abundantly.

ACKNOWLEDGEMENT

First and foremost, my sincere appreciation is gratitude to the almighty Allah for the precious gift of life, wisdom and His endless mercy to me right from the beginning of my life up to date and to my parents who have been there for me unconditionally.

Next is sincerely appreciating my supervisor and the entire Physics department who have endeavored to mentor and guide me very well and academically support me through out.

Furthermore, Mr. Luyimbaazi Drake the deputy head teacher of Standard High School-Bulumagi who has financially supported me in this project work, Mrs. Nakijoba Lydia who has also supported me in many ways during my course of study.

I also appreciate the management of Busitema university Nagongera campus, the department of physics Nagongera campus and my fellow physics colleagues of my class whom we have battled with so as to make ourselves achieve academically, may the good lord bless them for me.

Finally, I acknowledge Mrs. Hamba Zaina for the care, love and assistance she rendered to me during my course and in this project work and may the almighty Allah give her what she desires to have in her life.

ABSTRUCT

The primary aim of this study is to construct a solar concentrator and introduce it to Nagongera subcounty to be used by the natives of this area located in Tororo district of Uganda.

This research project aims at curbing the problem of environmental destruction in terms of cutting down trees so as to get firewood and burning them to get charcoal. However, this region has abundant sunshine compared to other regions of the country whereby if a solar concentrator is introduced to these people, they can easily do their cooking safely minus harming the environment.

The innovation will help also cub a problem of girl child trafficking as they walk long distances to look for firewood and also early teenage pregnancies as a result of teenagers having lots of leisurely times in the bushes looking for firewood which pushes them to be practicing the sexual act at an earlier age and moreover unprotected one.

The healthy advantageous part of this innovation of a solar concentrator is that it helps mothers who play a big part in cooking to stop taking in a lot of smoke from firewood which in turn affects their lungs resulting into lung cancer. This will be warmly welcomed and it will sustainably help save lives of people in Nagongera subcounty.

The project isn't expensive at all because the concentration of a solar concentrator requires the cheap environmentally available materials thus this enables almost every family to afford one and moreover the lifespan of this solar concentrator is long for as long as care is given to it while handling and keeping it. Because the economic status of people living in Nagongera subcounty is not that so high, this innovation will pave way for them to adjust sustainably to a healthier and more cost friendly device for cooking.

For the successful construction of a solar concentrator and its introduction to the Nagongera subcounty for use by the natives of this region will at the end be a sustainable development venture for this community and the country at large.

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CHAPTER ONE: INTRODUCTION

1.0 Introduction

This project is designed with a practical representation which is aimed at making an efficient and effective parabolic solar cooker and also energy storage mechanism for the apparatus.

There are basically three main types of solar cookers which are the box, panel and parabolic solar cookers. The parabolic reflector solar cooker is one of the most efficient ways to harness sunlight. Its unique parabolic shape concentrates all the sunlight at one focal point.

Today, solar cookers are globally used and continue to grow in popularity, people are moving away from other fuel sources such as wood, coal (natural gas) because of their harmful by products and un availability. Solar cookers also remove a large burden on many poverty-stricken areas by giving them a constant means of water purification so long as the sun is up. Every day, people find new ways to harness sunlight as a clean and powerful source of energy.

In this chapter, we shall find the background of the study, the statement of the problem, aim, purpose, objectives, the significance, scope and limitations of the study.

1.1 Background

In Torrid countries, food had dried or partly sodden by illuminations from sunlight according to Augustin Mouchot, a pioneering solar energy researcher who first described solar cookers briefly. Surprisingly, in the year 1860, French emperor Napoleon III had requested Mouchot to manifest cooking devices for the French colonizing corps in Africa. He invented some devices and those cooking devices had worked based on the principle of solar thermal energy.

A recent statistic shows that within2088, the world will run out of fossil fuels and now cooking purposes in urban areas people normally use gas, electricity or fossil fuels. Due to this situation, deforestation is growing in large numbers. Moreover, fossil fuels are rapidly used now days and in the long run, future generations have to face several problems like environmental pollutions, scarcity of energy resources as well as natural disasters. At present, refugee camps have to face a lot of problems hence the use of renewable energy instead of traditional resources is the best alternative solution for cooking purposes for rural households and refugee camps as well.

Solar thermal technologies maybe used in the field of cooking. The CSP (Concentrated Solar Power) is such a type of mechanism that converts solar radiation into thermal energy. Normally, reflector materials had been used to concentrate solar radiation and converted it into heat energy in an efficient way. It also concentrates heat energy on small surface which is called the focal point. Finally, from the heat of focal point can easily cook food or boil water for those unprivileged communities. (Ahmed etal, 2020)

1.2 statement of the problem

The Nagongera subcounty natives depend largely on cooking using firewood and charcoal that is in most cases expensive and inadequate for the big population of this region. The boys and girls of this region always go to the bushes in search for firewood

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