

**BUSITEMA  
UNIVERSITY**  
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**FACULTY OF ENGINEERING**

**DEPARTMENT OF AGRICULTURAL MECHANIZATION AND  
IRRIGATION ENGINEERING**

**DESIGN AND SIMULATION OF AN AUTOMATED  
POULTRY FEEDER**

**BY**

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**BU/UG/2011/46**

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*A final year Project submitted to the Department of Agricultural Mechanization and Irrigation Engineering in the faculty of Engineering in partial fulfillment of the requirements for the award of the degree of Agricultural Mechanization and Irrigation Engineering of Busitema University.*

**MAY 2015**

## ABSTRACT

The agricultural sector in Uganda has been proven to be crucial to sustain the ever growing population of the country. However, the traditional methods of practicing agriculture can no longer cope with the ever increasing demand of food in the country hence mechanization becomes the best way to increase production and reduce limitations to optimal performance of the sector.

Poultry farming is one of the greatest contributing activities in the agricultural sectors having mostly labour and monitoring requirements as the major challenges in management which hinders timely production and leads to a drop in yield.

The building of this project therefore focused on the design and simulation of an automated poultry feeder to refill the feeding troughs whenever feed is consumed by the birds, without human supervision.

The feeder is designed to operate on entirely mechanical means without any use of electricity so it can be afforded by even people in rural areas without electricity. It is to be different and better than the existing feeders and to achieve this data is gathered through extensive discussions and consultations with farmers and other resourceful individuals in the field. Also technical consultations and discussions with my supervisors are a key in this project development.


The feeder is designed to use basic easy to get materials like wood hence its selling price on the market wouldn't be a lot which enable all classes of farmers to afford it

The construction the feeder could not be done because of the several precision built components of the feeder like in the gate mechanism which require custom built parts that are difficult and expensive to manufacture

By the end of this project a detailed design of an affordable automated poultry feeder is presented and simulated. With detailed description in dimensions, material selection, operating parameters and pictorial representations of the design

## DECLARATION

I **MUTUMBA RAYMONDS** sincerely declare that all the written material contained in this report is an account of my own efforts except where cited and has never been submitted to any university or institution for an academic award.

Signature.....

Date.....20<sup>th</sup> of 2015



## APPROVAL

This project is submitted in to the department of Agricultural Mechanization and Irrigation Engineering, the faculty of Engineering at Busitema University as a partial fulfillment of the requirements for the award of a Bachelor's Degree in Agricultural Mechanization and Irrigation Engineering

Report approved by:

.....  
.....

**Mr. KavumaCris**

And

.....  
.....

**Mr. Okiring Patrick**

## **DEDICATION**

This project is dedicated to my mother Ms. Nakimera Prossy kiragga for her relentless support and love for me and my dreams throughout my entire life.

## **ACKNOWLEDGEMENT**

First of all I thank God for his blessing and unending mercies throughout my education and my life in general.

Then I thank my loving family for standing by me, supporting me and always believing in me more than anything.

I now appreciate Busitema University staff for the skills and knowledge they have added to me during my four years in the. Greatly appreciate my supervisors Mr. KavumaCris and Mr. Okiring Patrick for working hand in hand with me to accomplish my project.

Lastly I thank all my friends for the support and encouragement trough my time in busitema. May God bless you richly.

## LIST OF ACRONYMS

NAADS	National Agricultural Advisory Services
DOF	Degree of freedom
B.C	Benefit_ cost ratio
CAD	Computer Aided Design
GDP	Gross Domestic Product
UBOS	Uganda Bureau of Standards
IAEA	International Atomic Energy Agency
PW	Present Worth
AW	Annual Worth
WHO	World Health organization

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## **CHAPTER I: INTRODUCTION**

### **1.1 Background**

Four thousand years is a fair old time for chickens to have been domesticated. They originate from the Red Jungle Fowl (*Gallus gallus*, a small pheasant of Asia) and have provided us with eggs, fresh meat and feathers plus some traditional medicines. Domestic ducks are all descended from the lascivious ubiquitous mallard (*Anas platyrhynchos*) and domestic geese from the tame and confiding greylag (*Anser anser*) which provided meat, eggs and excellent fletching for arrow flights from the moulted wing feathers when the bow was a common weapon. Turkeys originated in Central and North America and the various colours come from the different subspecies ranging from Mexico up to New England. Chicken is one of the most common and widespread species, with a population of more than 24 billion in 2003 (Perrins, 2003).

Humans first domesticated chickens of Indian origin for the purpose of cockfighting in Asia, Africa, and Europe where very little attention was given to egg or meat production.

The earliest firm evidence for chickens in east Africa are illustrations from several sites in New Kingdom Egypt. Chickens arrived in western African at Iron Age sites such as Jenne-Jeno in Mali, Kirikongo in Burkina Faso and Daboya in Ghana by the mid-first millennium AD.

Today, more than 50 billion chickens are reared annually as a source of food, for both their meat and their eggs. The vast majority of poultry are raised using intensive farming techniques.

In Uganda, poultry is mostly centered in rural areas and the majority is on small scale with: high disease and parasite rates, low investments with costly management and monitoring being some of the greatest limitations to rapid growth to the industry.

### **1.2 Problem statement:**

Most poultry farmers in Uganda today use manual feeders that require one to constantly refill the feeding troughs throughout the day. However, there are high labour costs associated with this method, high management and monitoring costs. Also, constant exposure of humans with birds makes birds susceptible to disease and parasite carried from outside especially pullets.



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