



FACULTY OF ENGINEERING

**DEPARTMENT OF AGRICULTURAL MECHANIZATION AND IRRIGATION
ENGINEERING**

FINAL YEAR PROJECT REPORT

TITLED:

OPTIMIZATION OF MOTORIZED GROUNDNUT SHELLING MACHINE

BY

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A final year project report submitted to the Department of Agricultural Mechanization and Irrigation Engineering as a partial fulfillment of the requirement for the award of a Bachelor of Science degree in Agricultural mechanization and irrigation engineering

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ABSTRACT

Groundnut (*Arachis hypogaea*) is a species in the legume family. The botanical name *Arachis* means a legume and *hypogaea* means below ground, referring to the formation of pods in the soil. Groundnuts are used as food which has high content of carbohydrate and proteins and used industrially in making cakes and other products. Groundnut seeds as a by-product of its processing have a high edible oil content. Therefore, the commercial value of groundnut lies in its processing.

Processing of groundnut is still a minor activity in Uganda due to lack of appropriate technology and funds inspite of its high economic potential in the country.

Groundnut shelling can be done manually or mechanically. The available manual shelling method is associated with low shelling capacity of 0.5kg/hr per person, laborious, time consuming and costly. Shelling of groundnut pod with the help of mechanical power can be a probable solution of this problem. Different groundnut shelling machines have been designed and are available in the market. Some of them still have problems of low shelling efficiency (54%), mechanical seed damage (45%), some are large in size, costly (2.72 million) and not suitable for domestic applications. These still possess many challenges to farmers and processing industries where mass production is required. This project involves the process of designing the different parts of this shelling machine to improve on efficiency, reduce on mechanical damage, machine size while considering forces and ergonomic factor for people to use. The sheller will be made of Mild Steel (MS), angle bar, MS flat bar, MS rod, MS sheet and MS sieve. Serenut varieties will be used for the experiment since its more commonly grown. The result of my study will encourage the farmers and industries to take up this new technology to shell the groundnut.

Key words: Design and construction (fabrication), groundnut shelling, air blower, locally available materials.

DECLARATION

I OPEND ROBERT, hereby declare to the best of my knowledge, that this project proposal is an outcome of my original work and that it has not been presented to any institution of learning for an academic award.

OPEND ROBERT. (BU/UG/2018/2579)

Date:/...../.....

Signature:

APPROVAL

This final year project proposal will be submitted to the Faculty of Engineering of Busitema University for examination with approval of my supervisors.

Main Supervisor

MR. OBETI GRISM LAWRENCE

Date: /..... /.....

Signature:

Co-Supervisor:

Date: /..... /.....

Signature:

DEDICATION

This proposal is dedicated to my beloved family members in appreciation for their selfless care and parental support provided to me since childhood, and for the mentorship of hard work and determination delivered to me, which attributes I have cherished with firmness and which have transformed me to this level.

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I extend sincere gratitude to my parents **Mr. Okoth John Martin, Ms. Awor Sarah and my wife Ms. Aboth Christine** for the continued support they have rendered to my academic journey.

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ACRONNMS

UBOS – Uganda Buereau of Standards

AAS – annual Agricultural Statistics

MAAIF – Ministry of Agriculture, Animal Industry and Fisheries

NARL – National Agricultural Research Laboratories-Kawanda

NARO – National Agricultural Research Organization

PMA - Plan for Modernization of Agriculture

PPD – Post-Harvest Physiological Deterioration

SSA - Sub-Saharan Africa

Kgs – Kilograms

Kgs/h – kilograms per hour

mm – millimeters

KW – Kilo watts

g – grams

(ICRISAT) -International Crops Research Institute for the Semi-Arid Tropics

Kg/m³ – kilogram per cubic meter

TABLE OF CONTENTS

ABSTRACT	i
DECLARATION	ii
APPROVAL	iii
DEDICATION	iv
ACKNOWLEDGMENT	v
ACRONNMS	vi
LIST OF TABLES	ix
1 INTRODUCTION	1
1.1 Background.....	1
1.2 Problem statement.....	3
1.3 Significancy of study.....	4
1.4 Objectives.....	4
1.5 Scope of study.....	4
1.6 Expected Results.....	5
1.7 Justification.....	5
2 LITERATURE REVIEW	6
2.1 Groundnut trends in Uganda.....	6
Challenges faced by groundnut producers in Uganda(Okello et al., 2016).	8
Groundnut pre-harvest operations.....	9
2.1.1 Harvesting.....	9
2.1.2 Threshing.....	9
2.1.3 Drying.....	10
2.1.4 Post-harvest storage.....	10
Groundnut shelling technology.....	11
2.1.5 Challenges/ constraints faced during processing.	12
2.1.6 Institutional support and coordination along the groundnut value chain (Mugisha, 2014). 13	
Review of different existing groundnut shelling machines and methods.	13
2.1.7 Manual operated groundnut Shelling machines (GS100).....	15
2.1.8 Manual tire type.....	15
2.1.9 Manually operated groundnut sheller designed and fabricated by Wafula Simon Peter ..	16
2.1.10 Improved motorized sheller designed by Igira Ezedekel in 2018.....	16
Challenges facing the existing shelling machines.....	17

3	METHODOLOGY	19
	Design considerations.....	19
	Machine Description.....	20
	Procedural operation mode of the machine.	21
	Conceptual drawings of proposed groundnut shelling machine.....	22
	Design analysis of each machine components	23
	3.1.1 SPECIFIC OBJECTIVE I	23
	3.1.2 SPECIFIC OBJECTIVE II	31
	3.1.3 SPECIFIC OBJECTIVE III	32
4	RESULTS AND DISCUSSION	33
	4.1 DESIGN CALCULATIONS FOR MACHINE COMPONENT	33
	Design of the shelling sieve.....	35
	Design of the frame	45
	4.2 FABRICATION AND ASSEMBLY OF MACHINE COMPONENTS.	47
	4.3 PERFORMANCE EVALUATION OF THE MACHINE.....	50
	4.4 PERRFORMANCE (ECONOMIC) EVALUATIONOF THE MACHINE.....	52
5	. CONCLUSION AND RECOMMENDATIONS	55
	CONCLUSION.....	55
	RECOMMENDATIONS	55
	REFERENCES	56
	APPENNDICE	58

LIST OF FIGURES

Fig. 2. 1 Manual harvesting and Machine harvesting	9
Fig. 2. 2 Shows manual threshing	10
Fig. 2. 3 Shows farmers shelling groundnuts by hand	12
Fig. 2. 4 Agrimal groundnut sheller.....	15
Fig. 2. 5 Galvanized manual shelling machine	15
Fig. 2. 6 manual tire type	16
Fig. 2. 7 Manually operated groundnut sheller	16
Fig. 2. 8 Improved motorized sheller.....	17
Fig. 2. 9 Conceptual drawings	22

LIST OF TABLES

Table 1: Total area and total production of groundnuts by sub-region.	2
Table 2: Export Values for Uganda groundnuts.....	3
Table 3: Groundnut production trends of Uganda	7
Table 4: Groundnut Varieties grown in Uganda.....	8
Table 5: Belt classification (Dimensions of standard V-belts	Error! Bookmark not defined.
Table 6: Material Selection	29
Table 7: Tools, Equipment and Machines to be used	30