



**BUSITEMA
UNIVERSITY**
Pursuing Excellence

**FACULTY OF ENGINEERING DEPARTMENT OF
AGRICULTURAL MECHANIZATION AND IRRIGATION
ENGINEERING**

**DESIGN AND CONSTRUCTION OF A MANUALLY OPERATED
SIMSIM THRESHER**

BY

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ABSRRACT

Simsim is a small white nutritious oil seed with ready markets. It is produced by smallholder farmers. With the recent surge in global demand, simsim farmers in Uganda have turned increasingly to growing simsim as a cash crop. The major characteristics considered by simsim buyers and sellers are the seed color aroma and cleanliness. Besides problems of volume, small-scale production presents challenges of quality control, including adulteration with soil during threshing, which makes it difficult to meet the stringent standards required to access premium markets.

Threshing manually by the rudimental traditional method of beating on the ground is tedious, time consuming, labor intensive and results in simsim adulteration with soil. The adulteration with the soil leads to contamination by microorganism in the soils and affects the color and cleanliness of the seeds. The main objective of this project is to design and construct a manually operated simsim thresher, and test the capacity and efficiency of the proto-type. This project primarily focused on small holders producers of simsim and was limited to design, construction and on-station testing of the simsim thresher.

The following considerations was be made in material selection in order to optimize the fabrication of the thresher; quality (mechanical strength), suitability to working condition, availability, manufacturability and cost. Other parameters like weight and size of seeds, length of sheaves and moisture content of the simsim was also be considered.

The fully constructed prototype was be tested for output and evaluated economically and the 77.2kg of simsim was threshed per hour.

DECLARATION

I Okao Jimmy do hereby declare that this research project report is my own original work and that it has not been published and/or submitted for any academic award to any higher institution of learning. All the work contained in this report is as a result of my research except where cited.



OKAO JIMMY

Date: 4/JUNE/2015.....



APPROVAL

This project report has been submitted for examination with approval from the following supervisors:

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Main supervisor

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9/6/2015

DEDICATION

I dedicate this project report to my beloved parents Mr. and Mrs. John Alfred Ogal for the selfless care and support provided to me ever since childhood. I thank you for the spirit of hard work, courage and determination you have instilled in me throughout my school days till today.

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ACCRONYMS

ADA	Austrian Development Agency
BMF	Federal Ministry of Finance
FAO	Food and Agriculture Organization
GLOBALGAP	Global Good Agricultural Practices
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IPGRI	International Plant and Genetic Resources Institute
ITC	International Trade Centre
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
NARO	National Agricultural Research Organization
NaSAARI	National Semi Arid Resources Research Institute
NGO	Non-Governmental Organization
NOGAMU	National Organic Agricultural Movement of Uganda
SWOT	Strengths, Weaknesses, Opportunities, Threats
UBOS	Uganda Bureau of Statistics
UOSPA	Uganda Oil Seeds Processors Association

CHAPTER I: INTRODUCTION

1.1. Background

Simsim has been cultivated since antiquity. It is grown mainly in the tropics; simsim production is dominated by smallholders in developing countries. Simsim production in Uganda between 2004 and 2008 averaged 158,600 tonnes/year (FAO, 2010). Uganda is the world's fifth biggest producer of simsim after India (666,020), China (627,333), Myanmar (511,800) and Sudan (333,600) tonnes/year (FAO, 2010). Until 2002, the production of simsim in Uganda stagnated because of insecurity in the Northern region which is the main Centre of production. Recently, with peace and improved security in the main producing region, simsim production has grown both in volume and in value. Between 2002 and 2008 simsim production in Uganda grew by 66 % (from 106,000 to 173,000 tonnes) while the area planted to simsim increased by 38 % (from 211,000 to 286,000 Ha).

Valued for its small white nutritious seeds, simsim (*Sesamum indicum* L.) is locally known as simsim in East Africa. The crop is grown in Northern and some parts of Eastern and Western Uganda (Ashri, 2007). It is a high value crop with ready domestic, regional and international markets. Simsim is produced by smallholder farmers who grow it both for home consumption and as a cash crop. With the recent surge in global demand for simsim and simsim oil, farmers in Uganda have turned increasingly to growing simsim as a cash crop, earning it the nickname 'white gold' in Northern Uganda.

Growing sample households sells 78 % of the total volume of simsim produced. Farmers in Lango region sell the highest proportion (88 %) of harvest, followed by Teso (79 %) and Acholi (62 %). Thus, in all three regions simsim is grown primarily as a cash crop. The high proportion of sales suggests that simsim has the potential to raise farm income.

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