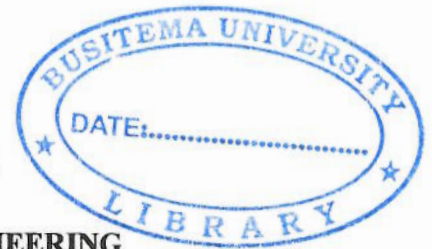




**BUSITEMA
UNIVERSITY**
Pursuing Excellence



FACULTY OF ENGINEERING

DEPARTMENT OF CHEMICAL AND PROCESS ENGINEERING

FINAL YEAR PROJECT REPORT

**DESIGN AND CONSTRUCTION OF A RED CHILI IMPACT PULVERISER
MACHINE**

BY

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BU/UP/2014/188

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*A final year project report submitted to the Faculty of Engineering of Busitema University
in a partial fulfillment of the requirements for the award of a Bachelor's Degree in Agro-
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DEDICATION

This report is dedicated to my late dear mother and father who by God's plan have not been in position to fully witness their son as he achieves all that they had wanted me to archive but am still proud of you and the platform you left behind for me to really utilize and move on as per your plans for me, to my brothers **Muwonge Fred, Serwano Wycliffe, Bukenya Charles, Katoora Frank** and sisters **Nabuuso Jane, Nakamoga Irene, Nabatanzi Cissy, Nakiddu Irene, Rebecca** thanks for the support that you've shown and given to me for am proud of you and promise to principally remain focused on the objectives that you expect me to archive and may the almighty God avail your heartily desires.

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DECLARATION

I **Kamoga Ivan** do declare to the best of my knowledge that the information in this report is as a result of my own efforts and has not been submitted to any university or institution of higher learning for the award of a bachelor of science in **Agro-processing Engineering**.

Registration number..... Bu/UP/2014/188

Signature [Handwritten Signature]

Date..... 23rd/05/18



APPROVAL

I **KAMOGA IVAN** do approve that this report contains original work done and skills gained during my **fourth-year** project development research at **BUSITEMA UNIVERSITY**.

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ABSTRACT

The red chili impact pulveriser machine was designed and constructed from locally available materials for pulverizing (grinding) spice particles such as chili pepper into small size enough to pass through the holes of the cylindrical sieve positioned beneath the hammer assembly. The grinding process is achieved by the use of a hammer in beating the material fed into fine particles; the fineness aimed depends on the detachable screen with aperture sizes ranging from 87 μ m to 2 mm. Based on the power ratings and output shaft speed of the existing grinding machines in industries, it was found that the main shaft speed of 2416.67 rpm transmitted by a belt drive from a three-horse-power electric motor is suitable to pulverize chili effectively. The machine was designed to be power-operated and portable with overall dimensions of 1000 x 200 x 700 mm. The economic evaluation of the machine revealed that the material worth of Ugx1,390,000 was used for its construction.

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CHAPTER ONE: INTRODUCTION

1.0 Introduction

This chapter gives a brief background on chili production export and demand patterns in the past years.

1.1 Background

Fresh chili and hot pepper exports to Europe have been increasing over the last years although the market is still small and mainly consists of consumers from “ethnic minorities”. There are literally dozens of different types of hot peppers, varying in color, appearance, taste, and, more importantly, “hotness” (*Amortherica, 2001*). Demand for individual types has been traditionally tied to the ethnicity of the consumer. For example, Asians in the UK prefer green cayenne types of hot chili and red scotch bonnet types of hot pepper, whilst Dutch Surinamese consumers prefer yellow hot peppers. Germany imports mostly “Turkish” types demanded by the large Turkish immigrant community.

Uganda exports Scotch Bonnet peppers mostly to the United Kingdom and Holland and green chili to the UK (*Amortherica, 2001*). Imports from Uganda are highest during the winter season because hot peppers are produced in Dutch Greenhouses and, to a lesser extent, in Mediterranean countries during the summer months.

The African Bird’s Eye Chili variety is one of the most pungent varieties of chili in the world and produced mainly in Malawi but also in Zimbabwe, South Africa, Ghana and Uganda (*CARE, 2012*). In 2010, Uganda exported peppers and chili to the world market worth US\$ 496,000; including African Bird’s Eye Chili. Exports to the European Union in particular constituted 82.86 percent or US\$ 411,000 (*CARE, 2012*).

(*Shika Agblor and Doug Waterer, June 2001*) noted that in the mature red market, peppers that have not fully ripened and have traces of green color are often unacceptable for marketing and freshly harvested peppers must be stored between 7 to 10°C and 95% relative humidity. The typical storage life of peppers under these conditions is 3-5 weeks. Storage life is limited by moisture loss. Peppers are sensitive to chilling injury when exposed to temperatures below 7°C. Symptoms of chilling injury include pitting and water-soaked tissue. Physiological disorders in peppers include

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