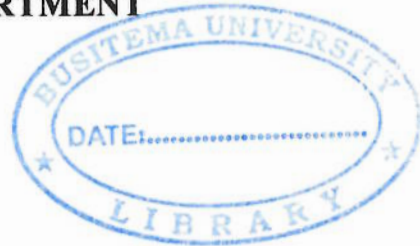




**BUSITEMA  
UNIVERSITY**  
*Pursuing Excellence*

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



**DESIGN AND CONSTRUCTION OF A MANUALLY  
OPERATED SORGHUM PLANTER**

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## **ABSTRACT**


The proposed study covers the design and construction of a sorghum planter, testing of the machine that was designed and the economic evaluation of the prototype. The varieties that were considered in this study were Epuripur and Serena. Chapter one presents the background the study which highlights the problem of the study and the importance of solving the problem through the design and construction of a manually operated sorghum planter which solved exposure of seeds to birds and harsh climate by planting seeds at a considerate depth. It deposits seeds at recommended inter and intra row spacing which solves the problem of poor spacing thus increasing production. Chapter one also presents the objectives and scope of the study as well as the likely benefits of the study to the smallholder farmers and the country at large.

An intensive literature review relating to sorghum varieties, planting methods, plant population and spacing. The advantages and disadvantages of the existing designs of sorghum planters are also clearly outlined in this chapter.

The methods that were used to undertake the study are presented in the methodology of chapter three. The methodology includes the procedures for design of the different components of a sorghum planter, construction of the prototype of the designed multi-grain cleaner, testing of the prototype and economic evaluation of the prototype so as to ascertain its affordability by the smallholder farmers. The results that were got in the study are presented in the results and discussions of chapter four. The results and discussions include the results for the design of the different components of a sorghum planter, construction of the prototype, testing of the prototype and economic evaluation of the prototype so as to ascertain its affordability by the smallholder farmers. Chapter five includes the recommendations and the conclusion of the designed planter.

**DECLARATION**


I WAFULA JULIUS hereby declare that each piece of information presented in this project is my own work and that to the best of my knowledge has never been submitted by any other person to any institution of learning for an academic award of any kind.

Signature: .......... Date: 21/05/2014



**APPROVAL**

I hereby do present this project report for approval as supervised for the process for which it's being written

Sign.  ..... Date. 25/06/2014

Mr. Owaa Sultan

Main supervisor

Sign. .... Date. ....

Mr. Mugisha Moses

Co-supervisor

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## **LIST OF ACRONYMS**

**FAO** Food and Agricultural Organisation.

**Kg** kilogram

**Ha** hectare

**Cm** centimeter

**Min** minute

**Rev** revolution

## CHAPTER ONE

### 1.0 INTRODUCTION.

#### 1.1 Back ground

Sorghum (*Sorghum bicolor*) is the third most important staple cereal food crop in Uganda occupying 265,000 ha of arable land. The crop is grown mainly in the south western highland and in the lowland areas of East and Northern regions of Uganda. Although the area planted to sorghum remains stable, the production has decreased from 467,000 metric tonnes in 1975 to 430,000 tonnes in 2002 (FAO, 2002). Yield from local cultivators is as low as 650 kg/ha as compared with improved varieties which under good management yield up to 3000 kg/ha. Sorghum yields tend to remain low because the crop is mostly adapted to and is grown in drier, drought prone regions in Uganda; consequently it is known as a food security crop. Sorghum includes a large number of widely cultivated grasses known under a variety of common and scientific names other names like Guinea corn, Kaffir corn, Great millet, Milo. Sorghum can tolerate a wide range of climatic and soil conditions that is that growing in drier areas is resistant to drought has, reduced leaf areas with a protective leaf coating which reduced transpiration rate. It is also resistant to both floods and diseases. The growth period of sorghum is 100-180 days depending on the variety.

*Epuripur* sorghum variety was found to possess excellent brewing qualities. It was released in 1995 by Serere Agricultural and Animal Production Research Institute. Its development was through pure line selection from a cross 2kx 17/B/1 made in the 1970s well as *Serena* was found to give high yields hence enhancing high food production.

Sorghum achieves dominance as food crop in extremities of the country that is Karamoja parts of Teso, alcoholic and Ankole, Kigezi highlands and these two areas account for half of the crop, the other half is grown in finger millet areas as insurance against drought and beer making. According to **Brian G Sims et al, 2006**, for as long as seeds are not planted in rows, all weeding must be done manually (usually with hand hoes. However, if crops are sown in rows properly spaced, draught animals and tractor can be used to pull a cultivator along the inter-row space. There will still be the need for some manual weeding within the row, but the total time taken for weeding will be very much shorter. In addition improper spacing between crops that is promoted

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