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## **FACULTY OF ENGINEERING**

**DEPARTMENT OF AGRICULTURAL MECHANIZATION AND IRRIGATION  
ENGINEERING**

**DESIGN AND CONSTRUCTION OF A PEDAL POWERED RICE THRESHER**

**BY**



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## ABSTRACT

This project report comprises of information on rice threshing and gives an account mainly on the design and construction of a pedal powered rice thresher; it's arranged in five chapters as summarized below;

Chapter one presents background to rice production and consumption with specific emphasis on Uganda's progress in rice production and value addition activities in the rice value chain. The problem considered in this study is presented in the problem statement including the justification; objectives and scope of the study are also presented.

Chapter two discusses the details of the various aspects involved in rice production with emphasis on the aspect of threshing; different threshing techniques and the operation of the existing rice threshers are presented

Chapter three encompasses the methods and procedures followed in the design, fabrication and testing of the thresher to meet the desired objectives and the assumptions that were taken into account for design purposes, the procedures used to fabricate and construct the designed prototype.

Chapter four contains the results and major findings that were obtained and concluded upon testing the machine. The designed and constructed machine threshed paddy rice with an efficiency of 89%, there were no losses involved in the form of breakages and the efficient threshability of the rice highly depends on the speed of pedaling.

The final chapter five contains the conclusion, challenges that were faced during the construction of the rice thresher and the recommendations to be incorporated to improve the prototype.

**DECLARATION**

I, OKWANGA Reagan Yoweri hereby declare that this project report is my own work and further more affirm that the work reported is original and no part or whole has been submitted to any institution for any purpose.

Signature: .....  ..... Date..... 29<sup>th</sup>. may. 2015 .....



**APPROVAL**

This project report was compiled and submitted to the department of Agricultural Mechanization and Irrigation Engineering under the following supervision.

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### ACRYNMS

GDP	Gross Domestic Product
NAADS	National Agricultural Advisory Services
NERICA	New Rice for Africa
NUSAF	Northern Uganda Social Action Funds
TE	Threshing Efficiency
ADPs	Agricultural Development Projects
FAO	Food and Agricultural Organization
MAAIF	Ministry of Agriculture Animal Industry and Fisheries

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## CHAPTER ONE: INTRODUCTION

### 1.1 Background

Rice (*Oryza sativa*, L) is one of the most important staple food crops in Uganda which is consumed in both rural and urban areas. Rice is ranked the fourth most widely consumed cereal after maize, beans, millet and sorghum in many parts of Uganda (Adewumi.J.K.2007). Rice grain is used as food and it could be prepared in various forms. Industrially, starch could be made from broken rice which is used in laundry, cosmetics and textile industries. The straw can be used as livestock feed, for thatching of houses and for making mats and hats. The husk can be used as fuel.

In Uganda, 80-90% of the population depend on farming as source of income and agriculture is the most important economic activity accounting for 43% of the GDP, (FAO and AGAL, 2005)). Rice production in Uganda is done mainly by the small scale peasant farmers in with less than 2 hectares under rice virtually all the agro-ecological zones of eastern Uganda such as smallholder farmer-managed rice schemes at Doho and the number of farmers deriving their livelihood from rice farming has grown from 4,000 to over 96,000 farmers in 2010 (MAAIF, 2012). Because change in diet of an average Ugandan family is in favour of rice, its demand is increasing substantially. The country's total annual rice production is now estimated to be 140,000 metric tons of milled rice, representing about 70 percent of the current national rice demand estimated at 190,000 – 200,000 metric tons (MAAIF, 2012)

Several efforts have been made, and are still being made, by the government to bridge the domestic supply – demand gap. Some of these efforts include provision of subsidized rice production inputs, establishment of favorable government policies and programs such as ADPs, NAADS and NUSAF, the upland rice project in which upland rice was introduced in Uganda as one of the, release of improved rice varieties such as upland NERICA rice in Uganda in 2002(Uganda climate change vulnerability assessment report – ANNEXES A – G August, 2013). All this was done as government's strategies to achieve its overarching development goals of poverty and food insecurity reduction due to the increase in demand and consumption of rice among the urban populations, the current higher rate of returns on investment in rice production

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