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

**PROJECT**

**DESIGN AND FABRICATION OF AMECHANIZED IRISH POTATO PEELER**

**BY**

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**REGSTRATION NUMBER: BU/UG/2009/11**

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## DECLARATION

I MUGERWA DENIS declare to the best of my knowledge that the piece of this report project is as a result of my research and effort and it has never been presented or submitted to any institution or university for an academic award.

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**APPROVAL**

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## ABSTRACT

Irish potatoes are widely grown in various districts in Uganda including: Kabale, Kisoro, Rukungiri, Mbarara, Kasese, Kabarole, Masaka, Mubende, Mbale, Kapchorwa and Nebbi districts. Peeling of potatoes is done when potatoes are required for consumption or processing into products like chips and crisps. In Uganda, potato peeling is often done manually using a hand knife; manual peeling using a hand knife is a highly tedious, labour intensive and time consuming process that is also accompanied by high quantitative and qualitative losses. There are a number of different mechanical peelers on the market which are manual or hand operated and others are automatic or electric but these are expensive and cannot be afforded by most people in Uganda.

The main objective of this project was to design and fabricate a low cost mechanized potato peeler to be used to peel Irish potatoes. The mechanized potato peeler designed and fabricated in this project consisted of the machine frame, the peeling drum with brushes inside for peeling, and the power unit. Design and selection of the various components of the potato peeler were carried out by analyzing forces acting on the components, sizing of the components, and selection of proper materials to be used to fabricate the components. The selected materials were those which would withstand the applied forces in order to avoid failure of the components during operation of the potato peeler. The designed and fabricated components of the potato peeler were assembled together to make the prototype. The rate of peeling efficiency of the prototype was tested to determine the amount of potatoes the machine can peel within a specific period of time. The cost evaluation of the designed and fabricated potato peeler was carried to determine the cost incurred during fabrication so as to find out if the machine is more economical and affordable compared to the available potato peelers on market.

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## CHAPTER ONE

### 1.0 Background

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 Gross Domestic Product (GDP), (FAO, AGAL, (2005)). In Uganda potatoes are grown in many households as food crop for food security and as cash crop for income generation. Potato is a high yielding crop, has a short growing period and also potatoes can be stored for a long time under good storage conditions. Potatoes are mainly grown in the cool highland areas of Uganda, at about 1500 –3000m altitude. Currently the major Irish potato growing districts of Uganda include; Kabale, Kisoro, Rukungiri, Mbarara, Kasese, Kabarole, Masaka, Mubende, Mbale, Kapchorwa and Nebbi (<http://www.foodnet.cgiar.org/market/Uganda/Reports/Irishpotato.pdf>). Irish potato varieties grown in Uganda include; Rutuku, Victoria, Kisoro, NAKPOT 1, NAKPOT 2, NAKPOT 3, Kruzer and Sangema. Victoria is the most commercially grown variety because it yields high produce, matures earlier and it's tolerant to bacterial wilt. In the districts where Potatoes are grown, it's both a staple food and main source of income. Kabale and Kisoro districts are considered to be the major producers of Irish potatoes in Uganda and they produce the best quality potatoes mainly referred to as Victoria for chips and Rutuku for crisps. Potato production in Uganda is entirely for the domestic market. Due to increased demand of potatoes, particularly in the urban areas, potato production in Uganda is increasing and it's spreading into central Uganda. There are approximately 200,000 households across the country producing potatoes on plots of less than one hectare.

Processing of potatoes is gaining potential and the local market is available and growing due to increase in rate of urbanization and growth of fast food restaurants and takeaways where potatoes are mainly consumed. According to Ferris et al (2000), nearly 50% of urban potato consumption is processed and it is projected that by 2015 approximately 250,000 metric tonnes of Irish potato will be consumed as processed products such as chips and crisps. For potatoes to be eaten in any form they need to be peeled; therefore, peeling is one of the most important steps in potato processing and optimum yield greatly relies on the efficiency and effectiveness of the method of peeling. The quality and quantity of processed potatoes are influenced by the quality of the peeling stage; low

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