



**BUSITEMA  
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*Pursuing Excellence*

**FACULTY OF ENGINEERING  
DEPARTMENT OF COMPUTER ENGINEERING**

**AUTOMATIC BIRDS DETER SYSTEM**

BY

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## **DECLARATION**

I, SOYEKWO ELIUT, BU/UG/2013/1608 do hereby declare that this Project Report is original and has not been submitted for any other degree award to any other University before.

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## **LIST OF ACRONYMS**

ABD-SYSTEM	Automatic Birds Deter System
DSIP	development Strategy and Investment Plan
JICA	Japan International Cooperation Agency
PEAP	Poverty Eradication Action Plan
MAAIF	Ministry of Agriculture Animal Industry and Fisheries

## ABSTRACT

In the developing countries like Uganda it's very true that people still rely in Agricultures as a great and the most source of income to service most of their house hold income. Agriculture is the back born of Uganda and Government recognized the role of the Agricultural sector in poverty eradication and is therefore implementing a *Poverty Eradication Action Plan* (PEAP), as the key national development agenda for a few decades to come (MFPED, 2000). Rice production is a major intervention identified in the Ministry of Agriculture Animal Industry and Fisheries (MAAIF) development Strategy and Investment Plan (DSIP) [1] for food security and poverty reduction in Uganda. The Uganda National Rice Development strategy (NRDS) lays out Uganda's strategy for promotion of rice production [2] with the aim of increasing household food security and reduce household poverty through increased production of high quality rice. The use of children by parents to look after plantations during schooldays spoils their education hence affecting their future, and spraying birds as a solution using chemicals is not favoring both human life and the environment in Uganda today. However, the main objective of this project was to design and develop an automated bird deter system that was to generate predator scaring voices when birds are detected. As farmers and big farming companies are every day battling with local tiresome methods of keeping crop plantations from being destroyed from birds. The ministry of agriculture and wildlife in Uganda are still in conflict when it comes to farmers using brittle methods of scaring away birds and till date children in rural areas still miss school during seasons of keeping birds in gardens, this really justifies that there was a need to design a system that can sort out all the above challenges in order to scare away birds in an easy way and cheap in a long run without killing the birds. **ABD-SYSTEM** generates predator sounds after detecting the voices and birds movements.

In most cases when birds hear their predator in a particular area they always change their flying zone. Several sound speakers were used in a way that the speakers do not output the predator sounds at the same time. The automatic birds deter system is the system that farmers use it to both detect and scare away the birds that destroys the cereal crops automatically by capturing their high pitch sounds and their movements during the fly overs. The system out puts the predator sounds. However much many systems are on use, this system can give 85% on how to capture the presence of a birds that destroys cereals in gardens. The strong parameters chosen are biologically defined to be the strongest values and behaviors that can allow one prove and identify the target species in an ecosystem.

This system still give chance for more research to be done on how to scare birds away from the cereal and other plantations. Finally this project really gave me a great experience as far as research is concerned and hard ware coding, however, the idea development in Africa should still target the local applications and with the context view point of this project, it is targeting the traditional problem and this to my understanding defines the core of engineering as a traditional course.

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## CHAPTER ONE

### INTRUDUCTION

#### 1.1 BACKGROUND

Agriculture is the back born of Uganda and Government recognized the role of the Agricultural sector in poverty eradication and is therefore implementing a *Poverty Eradication Action Plan (PEAP)*, as the key national development agenda for a few decades to come (MFPED, 2000). Rice production is a major intervention identified in the Ministry of Agriculture Animal Industry and Fisheries (MAAIF) development Strategy and Investment Plan (DSIP) 2009/10 -2013/14 for food security and poverty reduction in Uganda.

The Uganda National Rice Development strategy (NRDS) lays out Uganda's strategy for promotion of rice production between 2009/10 - 2017/18 with the aim of increasing household food security and reduce household poverty through increased production of high quality rice.

Basing on the farming activity in Kween and Kapchorwa district at the lower belts (Ngenge swamp area recently proposed to be irrigated by NGO called Japan International Cooperation Agency (JICA) located in eastern Uganda and the major crops being rice and sorghum, I personally participated in the year 2011 to 2013 in keeping of rice plantations from being destroyed by pests most especially the birds.

scaring birds away using local methods through human labor is too hectic, tiresome and expensive, the most challenge is that farmers deny their own children from going to school and use them to look after birds from destroying rice plantations. This is not only in Kween in particular but the problem is all over the country most especially areas that plant rice and other related crops like wheat and sorghum.

For three months, farmers in Kapchorwa and Kween districts under the Kapchorwa Commercial Farmers Association (KACOFA) have been counting losses after an invasion of red-billed Quelea birds.

“The main characteristic is that they come in big numbers,” said Mr. George Toskin, an official from the organization. “These birds have left many famers indeed counting loses after investing in cultivation, planting and hiring land and labor.”

The most affected areas are Magunga and Mututano villages, Ngenge Sub-county in Kween, where over 1,095 acres of sorghum has been completely destroyed [daily monitor Wednesday July, 10, 2013] [1]

“We have various measures, including using tractors, motorcycles, drums and bells to scare-away these birds but all our efforts have not yielded any fruit. And on top of that, we employed about 120 people to do the same job but were overwhelmed by the birds in millions. So this season, we call it a bad season,” Kissa explained [daily monitor Wednesday July, 10, 2013] KACOFA had anticipated earning about Shs1bn after having invested in Shs600million but all became a great loss.

However, some farmers sprayed birds which became too dangerous to both the environment and eco system as well were **Uganda wildlife authority** raised a concern, so the conflict till date is between the wildlife authority and the ministry of Agriculture.

## **1.2 PROBLEM STATEMENT**

The use of children by parents to look after plantations during schooldays spoils their education hence affecting their future, and spraying birds as a solution using chemicals is not favoring both human life and the environment in Uganda today. This led to a need for development of “**Automatic Birds deter system**” which scare away birds without killing them.

## **1.3 OBJECTIVE**

### **1.3.1 Main objective**

Was to design and develop an automated bird deter system that was to generate predator scaring voices when birds are detected.

### **1.3.2 Specific objectives**

- Was to review the existing literature on birds deter and detection systems.
- To identify and analyze the requirements needed to accomplish the development of the system.
- Was to design the system in accordance with properly analyzed user requirements and functional requirements.
- Was to ensure birds were detected by the system.
- Was to test and validate the modules in the system to developed.

## **1.4 Justification**

As farmers and big farming companies are every day battling with local tiresome methods of keeping crop plantations from being destroyed from birds.

The ministry of agriculture and wildlife in Uganda are still in conflict when it comes to farmers using brittle methods of scaring away birds and till date children in rural areas still miss school during seasons of keeping birds in gardens, this really justifies that there was a need to design a system that can sort out all the above challenges in order to scare away birds in an easy way and cheap in a long run without killing the birds.

### **1.4.1 Significance**

Instead of a farmer having a large farm employing a number of people to keep the same plantation is too costly in a long run since this is done season after season and year after a year, the farmer rather installs the system in particular selected positions in the garden. However, the use of falcon voices was more efficient since falcon is an enemy to many birds that destroy cereal crops.

The **Automatic birds deter system [ABD -SYSTEM]** both detect and scare away the birds at the same time in the garden and cheaper in the long run and less hectic since it is to be bought once and installed, changes are always done after a long period of time unlike the local methods.

### **1.5.1 TIME SCOPE:**

The review of literature and existing systems, application design, implementation, and testing and validation took five months from October 2016 to April 2017.

### **1.5.2 GEOGRAPHICAL SCOPE:**

The system works for all cereal crop gardens regardless of the land topography, the cereal crops include rice, wheat, sorghum and other cereal crop plantations that can be destroyed by birds.

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