

# Agriculture Protection from Animals Using Smart Scarecrow System

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**Abstract-** Subsistence farmers of our country repeatedly encroaching wild habitats so interaction between farmer and wildlife increases resulting into the conflicts. We studied how the pattern of raiding changes according to different seasons, farm land and crop types. A smart scarecrow system is constructed to minimize crop raiding and man animal conflict from wild animals and birds. The scaring system works in three parts: time delay, servo control with flash light and automatic sound system. Depending upon seasonal cropping pattern sound of the system get automatically adjusted using mp3 module. In our study we take samples from different farms combined and observed how object detection vary at day and night in three seasons which gives monthly efficiency of the system. It is more convenient and cost effective than traditional scaring strategies like trapping, hunting and wood fencing. No manpower is required for scaring. The present system is made up of metal body so it can work in worst climate conditions.

**Keywords –** Servo Motor, Arduino Nano, DF Player Module, Speaker, Torch, Smart Scare Crow.

## I. INTRODUCTION

One of the great dilemmas of our era is the increasing conflict between wildlife- farmers and crop raiding. It has been around since beginning of agriculture. Recently Tamil Nadu reported a total of 7,562 incidents of crop-raiding by wild animals in the last three years. There are many different situations and reasons where wildlife-farmer come into conflict. Some of the reasons for that is in search of water, livestock predation, increase in human populations, increase in agriculture and reduction in forest land, the availability of palatable and nutritious foods near farm edges.

For that farmer utilize strategies and traditional methods that are often cruel and ineffective. While arbitrary killing, trapping or poisoning of suspect may provide short-term satisfaction but it fails to address long-term needs. So, we must seek to understand sociological, economic and cultural aspects to find solution. Researchers suggest managing pastures to reduce competition for forage between wildlife and domestic livestock. In addition, shifting from farming system with perennial crop may reduce losses. But this cannot be the proper solution for the problem. In general, crop damage by monkey and wild-boar is more serious in northern part especially in lower altitude areas.

So, farmers usually adopt some crop protection strategies guarded their crop by spending night out in field, wood fencing whereas wealthier farmers used imported barbed wire, trapping, hunting are popular. Use of plastic flags, brightly coloured objects, scents and fireworks works

sometimes but again that are marginally successful. Some make system consists of sound clips for different animals and red lamp connected to stick which is not durable. There are smartphone-controlled systems but here was no provision of movement. For birds unmanned aerial system (UAS) is used to deter birds. To detect birds, background subtraction algorithms have been used. For security and detection some use sensor cloud-based architecture implemented using IOT. Many systems developed which detects the intruders, monitors any malicious activity and then reports it to the owner of the system but these are unable to fear the wild animals and primates.

There is by no means an easy solution to this problem. Wild-animals now a days are smart enough they learn to overcome obstacles such as fences and scarecrow. So, there is need of automation system in agriculture field which can avoid man animal conflict and crop raiding. So, one of the technological solutions for this problem is smart scarecrow system which uses high intensity light, arm movement to fear the animal as well as birds. The common form of scarecrow is a humanoid structure dressed and placed in open field to discourage the birds and animals from disturbing and feeding on recently cast seeds and growing crops.

This system consist servo motors present here performs the motion operation of scarecrow arm and firecracker sound buzzer is used to demotivate the animal as well as birds and for the night time high intensity lights placed on head is used to keep animals away from farm field. Advancement is needed in this sector too.

## II. PROBLEM STATEMENT

Hungry birds have always been a problem for farmers. Sometimes the birds could eat so much corn or wheat that a farmer and his family would not have enough food to last through the winter. So, for more than 3000 years, farmers have been making scarecrows. Due to physical damage of paddy fields as a result of hungry birds feeding on them, farmers are facing a considerable loss in their paddy yield harvest in terms of quantity, quality, and monetary gains they expected to acquire from their harvests because the current traditional techniques employed by these farmers such as the use of static scarecrows are only effective for very small fields.

Large commercial rice farmers also faced extensive labor requirements for bird scaring which is very expensive and sometimes it may not be available when needed. The lethal methods used for bird control such as treatment of paddy fields with avicides (chemical substances lethal to certain bird species) are not environmentally friendly since they can also be dangerous to human beings.

## III. OBJECTIVES

### 1. Main Objective

To design and construct a modern bird and animal repellent prototype that is automatic and plays sounds/signals of distress to scare away animals and birds.

### 2. Specific Objectives

- To design a rotating system
- To design a portable device.
- To identify the current techniques used to chase away or control bird and animals
- To design a sound producing system and a motion detection device.

## IV. SIGNIFICANCE

This project scares off birds and animals from fields hence reducing on the physical damage the birds would cause to the crops. And thus, increasing on the quantity and quality of the harvest as well as increasing the monetary gains to the farmers. The device saves the large-scale commercial farmers on money they would spend annually on the labour of the bird scarers. And also, it is environmentally friendly compared to the lethal technique used by some farmers such as treatment of field with avicides hence making it a more desirable technique of bird rice damage control.

## V. BLOCK DIAGRAM

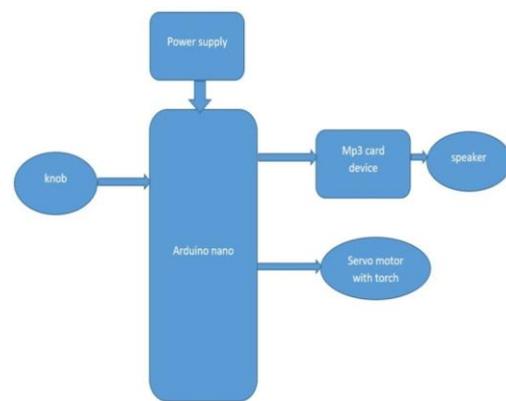


Fig. 1 Block diagram of project

## VI. CIRCUIT DIAGRAM

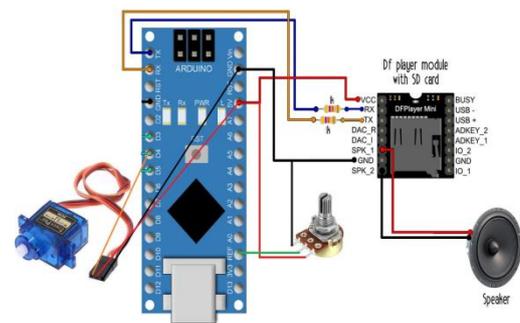


Fig. 2 Circuit diagram of project

## VII. COMPONENTS USED

1. Arduino Nano
2. 10k Pot
3. Servo Sg90
4. DFPlayer Mini MP3 Player Module
5. SD Card
6. Speaker
7. 5VDC Regulated Power Supply
8. Torch

## VIII. SOFTWARE USED

- [1] Arduino IDE Ver. 1.6.5

## IX. CONCLUSION

The automatic scarecrow is a very loud and dynamic device with the strong potential to scare off avian pests from the gardens and farms. The device has the potential to work all by itself. The system can also be used to chase away birds from airports, roofs of residential and

commercial buildings, learning institutions, and offices that cause sound or noise pollution when they are in large flocks, or cause a problem of sanitation where they drop their excreta.

#### REFERENCES

- [1] Sillero-Zubiri, Claudio, and David Switzer. "Crop raiding primates: searching for alternative, humane ways to resolve conflict with farmers in Africa." Wildlife Conservation Research Unit, Oxford University, Oxford (2001).
- [2] Sonam W. Wang, Paul D. Curtis, James P. Lassoie. "Farmers Perceptions of crop Damage by Wildlife in Jigme Singye Wangchuck National Park, Bhutan." Wildlife society bulletin Volume 34, Issue-2, June 2006.
- [3] Jeff Beringer, Kurt C. VerCauteran and Joshua J. Millspaugh. "Evaluation of animal-activated scarecrow and monofilament fence for reducing deer use of soybean fields." USDA National Wildlife Research Centre, 10-17-2003.
- [4] Ksenija Sabic. "Human-Wildlife Conflicts in the Nanda Devi Biosphere Reserve, Uttarakhand, India." April 2011.
- [5] Kyung Mog Lee. "Study on a Smart Phone Application Controlling Harmful Animals Scaring System Applicable to Farm Protection". WCECS 2016, October 19- 21, 2016, San Francisco, USA