Agricultural Field Protection from Wild Animal

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ABSTRACT: ***In several areas, surveillance plays a significant role, whether at home, hospitals, schools, public places, farmland, etc. It allows us to track a certain area and avoid theft and also gives proof of evidence. In the case of farmland or agricultural land surveillance, it is very critical that unauthorized people are prevented from entering the region and that the area is protected from animals. In everyone's daily lives, technology plays a central role. In several industries, there has been a rise in demand for the Internet of Things (IoT), which has received considerable research interest from both academia and industry. The implementation of IoT has led to smart farming, precision agriculture, just to name a few, in the agriculture sector alone. This paper introduces the development of an Internet of Things crop protection framework for the prevention of animal intrusions in the field of crops. To avoid possible damage to agriculture from wild animal attacks a repelling and monitoring system is provided.***

KEYWORD: Animal, Agricultural land, Farmer, Surveillance, Sensor, Safety precautions, Ecosystem.

INTRODUCTION

In the world, agriculture is dependent on the economy of many countries. Despite economic growth, the backbone of the economy is agriculture. The main stability of the economy is agriculture. It contributes to the domestic gross product. Agriculture meets people's food needs and provides a variety of raw materials for industry. Yet there would be a huge loss of crops due to animal interference on agricultural land. Crops are going to be completely ruined. There would be a substantial amount of loss of farmers [1].

One of the major threats to reducing crop yields is crop damage caused by animal attacks. Crop raiding is one of the most conflicted human wildlife relationships due to the extension of cultivated land into previous wildlife habitats. The use of electrified welded mesh fences, chemicals or organic substances and gas cannons are the latest methods used to tackle this problem. The use of balloons, shot/gas guns, string & stone, etc. is other typical methods applied by farmers. Sometimes, such solutions are cruel and unsuccessful. They often require a significant amount of installation and maintenance costs and some of the approaches impact both humans and animals with environmental emissions.

Chemical products used to avoid these animal attacks, on the other hand, have an application cost per hectare and their efficacy depends on the weather, because rain can cause a dilution effect. Technology assistance at various stages of agricultural processes will significantly enhance the crop yield. Sensor networks demonstrate a major improvement over conventional invasive control approaches. This paper provides a solution based on an animal-friendly ultrasound generator that does not cause physical or biological injury to animals or noises that are audible to humans.

LITERATURE REVIEW

Animal attacks in India are common news nowadays. These attacks kill villagers and also destroy their crops because of the inaccessibility of any detection device. These villagers are left powerless to their fate due to a lack of adequate safety measures. A proper detection system may therefore help to save their lives and also to protect crops. The villagers' crops are also ruined because of constant animal interference.

The rising rate of decline in forests and invasive agricultural land is leading to an increase in animal invasion of fields, leading to a dramatic shift in the perception of farmers towards them [2].

METHODS	METHODOLOGY USED	MERITS	DEMERITS	COST
FENCES	Wheatstone bridge principle in electrical fences	1. Easier installation 2. Easy maintenance 3. More Durable and longer lasting	1. Damage during storms, thunder and lightning 2. Risk of dangerous shocks	Approx Rs 5000/ meter
ARTIFICIAL REPELLENT	Odour based chemical and sound based electronic repellents	1. Low cost 2. Easy availability	1. Do not work in most cases 2. Results in crop disease	Variable
ACOUSTIC SYSTEM	Makes use of the sound of predators to scare the animals	1. Affordable 2. Easy installation	1. Less reliable 2. Requires maintenance	Approx Rs 1500/ system
MICROCONTROLLER BASED SYSTEM	On any kind of intrusion, activate buzzer and intimates the farmer with a message	1. Reliable 2. Faster 3. Efficient	1. Requires maintenance 2. High cost 3. Porn to damages during rains and thunder	Approx Rs 4000/ device
INTRUSION DETECTION SYSTEM	Provides a system, in addition to the above methods, to ward off animals automatically	1. High Efficiency 2. Fully Automated Solar Powered	1. High cost 2. Requires Maintenance	Approx Rs 8000/ device

Table 1: Comparison table of the existing methods

Only surveillance facilities are provided by the existing systems. Existing systems did not provide safety from animals, especially in rural areas. System also needs to take appropriate actions based on the type of animal identification which tries to enter a particular area, as various methods are developed to prevent different animals from entering in agricultural areas [3]. Also the farmers resort to the other methods by placing human puppets in field & effigies in their farms, which is ineffective in warding off the wild animals, though is useful to some extent to ward off birds .The other commonly used methods by the farmers in order to prevent the crop protection by animals include building physical barriers, use of electric fences and manual surveillance and various such exhaustive and dangerous methods.Electronic repellents are an effective, long lasting, and eco-friendly method for crop protection which repels animals without harming them. Farmers use one of the following two types of electronic repellents:

- Ultrasonic electronic repellent: silent to humans, high-frequency sound waves repel wild animals.
- Sonic electronic repellent: audible noise that scares animals.

There is comparison of the various existing methods to divert animals from the agricultural areas are being shown below in table 1. In the proposed system, the entire process is done by using a microcontroller which discloses three stages for animal repellent. In this proposed system Radio Frequency Identification is used for detection of the animal from entering into the agricultural land that's why it has multi usage such as counting animals in the forest, detection & also monitoring and tracking the animals using GPS & it is cost efficient. In this proposed method the alert notification not only sent to the forest officer it also sent the notification to the living people in the agricultural land with the help of GSM module. The RFID tag is injected in the animal skin by the RFID injector which is the recent technology. If The animal reaches the particular place the RFID Reader reads the And the intimation of detected animals sent through

the SMS by GSM modem then repellent the animal to the forest by preventing intrusion in farmland using irritation noise and cracker sound made by the speaker.

CONCLUSION & DISCUSSION

In this paper presented an integrative approach in the field of Internet of Things for smart Agriculture focused on low power devices and open source platforms. The purpose of this work is to provide a system of repelling and monitoring against animal attacks and weather conditions for crop protection. We will broaden the current functionality of our system in our future work and explore the possibility of integrating the features of our system into other sectors. Animal attack security this paper will broaden the current functionality of our system in our future work and explore the possibility of integrating the features of our system into other sectors.

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