CHALLENGES AND DRAWBACKS OF SMART FARMLAND USING RASPBERRY PI CROP PREVENTION AND ANIMAL INTRUSION DETECTION SYSTEM

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Abstract—India has agriculture as its primary occupation. According to IBEF (India Brand Equity Foundation) 58% of the people living in rural areas in India are dependent on agriculture. Wild animals are special challenge for the farmers throughout the world. Animals like wild boars, elephants, monkeys etc…cause serious damage to crops. The previous project utilized the RFID (Radio Frequency Identification Device) module and GSM (Global Sytem Mobile). Forest officer and farmers will get these SMS containing area in which that animals observe. The techniques that already being used is ineffective, in this article I am presenting a practical procedure to ward them off, by creating a system which gives the solution for multi collision of messages and physical security for the RFID device.

Keywords-components: RFID tag; anti-collision detector; RFID reader; power supply; raspberry pi; IoT cloud; speaker; fog machine

1. INTRODUCTION

Farmers are facing a lot of difficulties because of the wild animal like elephant, tiger which cause serious damage in the crop by running over the field and trampling over the crops. The previous project utilized the RFID (Radio Frequency Identification Device) module and GSM (Global Sytem Mobile). RFID is a technology which works on radio frequency or radio wave to automatically identify the object or tracking the object. Radio frequency identification (RFID) is used to describe a system that transmits the identity (in the form of a unique serial number) of an object wireless, using radio waves. GSM is one of the way of connection to the internet like Ethernet and Wi-Fi connection.

2. EXISTING METHOD

Existing system consists of four stages for animal repellent

RFID injector:

The RFID tag is injected in the animal skin by the RFID injector. The animal can be detected by the RFID injector. The LF tag which inject under the animal skin. After the detection It is inject in the animal skin, if the animals enter into the farm land

RFID reader:

It describes the system that transmits the identity in the form of unique serial number. When the animal is detected by RFID tag. The RFID reader detect the animal and send the message to the forest officer and farmers using GSM.

Fog machine:

It's a portable fog makers that constantly blows out the fog as and when desired. It contains two conical container with two circular activities.

One cavity is used to make a fan mounted lid which is used to drive air and push it inside the container. Can be mover easily in order to pour water or dry ice into the chamber.

Other cavity is used to drive out the fog through the small funnel.

Speaker:

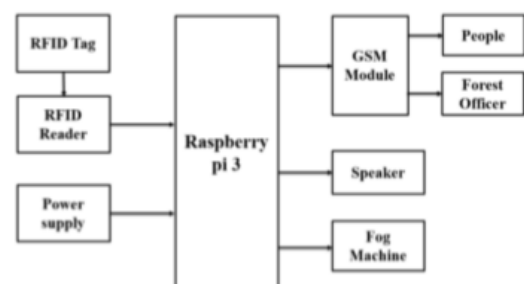The animals repellent to the forest by using irritation noise by speaker.

Fig: 1 Functional Block Diagram

Drawback of existing method:

Passive tag: Passive tag which is used in existing method has the range of 10cm to few meters.

Coverage: Wild animal can destroy the RFID device so it should consist of good physical security. Which must be protected against the wild animal.

Tag all animals: Since RFID reader can only detect the animal which is tagged in. Device not able to detect the animal which is new to the forest.

Challenges ahead:

Reader collision: In case RFID reader detects multiple animals it sends intimation of detected animals through SMS by GSM model. While sending multiple unique id there is a possibility of multi collision of messages.

Physical security: Wild animal can destroy the RFID device so it should consist of good physical security. Which must be protected against the wild animal.

3.   PROPOSED METHOD

In the proposed method, the entire process done by using Raspberry pi as existing method and it consist of two additional stages for animal repellent.
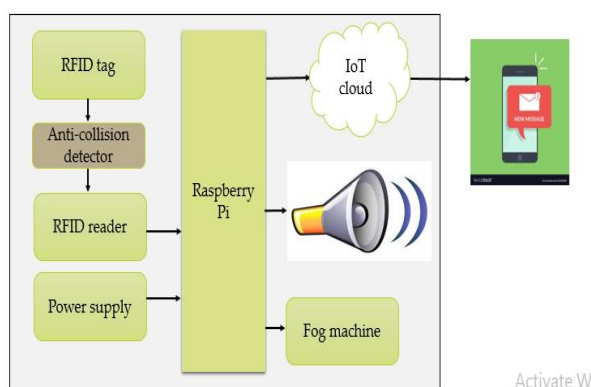

Fig: 2 Functional Block Diagram

Anti-collision detector: It is a collision avoidance system which keeps radio waves from one device from interfering with radio waves from another device. This anti-collision detector enables a single reader to read more than one tag without the collision in the reader's field.

IoT cloud: GSM (Global System Mobile) is one of the way of connection to the internet. IoT (Internet of Things) is the network of physical objects embedded with network connectivity. So GSM can be used for working of IoT.

4.   CONCLUSION
5.

Identifies the necessity of physical security to RFID components. The proposed system based on Raspberry pi is found to be more compact, user friendly and less complex, which can readily be used in order to perform. The process is fully automated and it does not cause any hurt to animal during repellent

REFERENCES

[1] Manlio Bacco, Andrea Berton, Erina Ferro, Claudio Gennaro, Alberto Gotta, Stefania Matteoli, Fabio Paonessa, Massimiliano Ruggeri,Giuseppe Virone,   Alberto Zanella "Farming: Opportunities, Challenges and Technology Enablers" IoT Tuscany (2018)

[2] S. Santhiya, Y. Dhamodharan, N E. Kavi Priya, C S. Santhosh,   M.Surekha "A smart farmland using raspberry pi crop prediction and animal intrusion detection system" in 2018 International Research Journal of Engineering and Technology (IRJET)

[3] Geethapriya Thamilarasu and Ramalingam Sridhar University at Buffalo, Buffalo, NY 14260-2000"Intrusion Detection in RFID Systems "in 2014 Conference Paper

[4] Jan Bauer and Nils Aschenbruck   "Design and Implementation of an Agricultural Monitoring System for Smart Farming" in IoT Tuscany (2018)