



# CROP PROTECTION AND MONITORING FROM ANIMALS ATTACKS BY USING IOT SOLUTIONS

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**Abstract** : Farm crops are frequently destroyed by neighbourhood animals including buffalo, cows, goats, birds, etc. For the farmers, this results in enormous losses. Farmers cannot block entire fields or remain on the field all day to secure it. Hence, we suggest a mechanism for automatically protecting crops from animals. This system is microcontroller-based and uses microcontrollers from the Arduino family. A motion sensor is used by this system to identify approaching wild animals close to the field. The sensor instructs the microcontroller to operate in this situation. The microcontroller now plays an alarm to tempt the animals out of the field and sends an SMS to the farmer so that he is aware of the issue and may react by being present at the scene in case the animals don't flee after hearing the alarm. This completely protects the crops from animals, preventing loss to the farmer.

**Index Terms** - Arduino UNO,Speakers,GSM/GPRS module,IR Sensor,Relay,DC Pump.

## I.INTRODUCTION

Animals attacks in farmers land is common now a days. Due to unavailability of any detection system. There is a proper detection system could help to preservation of crops. Also the crops of farmers are destroyed due to frequent interference of animals. The crops and paddy fields cannot be always fenced. So the possibility of crops being eaten away by cows and goats are very much present. This could result in huge wastage of crops produced by the farmers. To make the best use advanced technology. This system helps us to keep away such animals from the farmlands . Hence, we created a device that might be very helpful for farmers; it boosts production, prevents crop loss, and safeguards the property from intruders.

## II. RELATED WORK

[1] Balakrishna, K., Mohammed, F., Ullas, C. R., Hema, C. M., & Sonakshi, S. K. (2021).

IOT and machine learning are used to protect crops from animal trespass. Animal infiltration is a serious danger to crop yield, which has an impact on food security and lowers farmer profits. The Internet of Things and machine learning techniques are being developed in this proposed model's answers to this issue. The ESP8266 Wireless Fidelity module, Pi Camera, Buzzer, and LED are all interfaced with the machine algorithm, which is run on the Raspberry Pi. To identify objects in photos and categorise the animals, machine learning algorithms like Single Shot Detection and Region-based Convolutional Neural Networks are crucial. The results of the experiment show that Single Shot Detection outperforms Region-based Convolutional Neural Network technique. Finally, the software that integrates with the Twilio API decimates the information so that farmers can act swiftly in their farm fields.

[2] Ramkumar, A., Deniston, A., Kishore, K., & Faizuddin, R. (2021, October).

IOT technology to prevent wild boar damage to crops. When animals leave and enter protected areas, problems between people and wildlife arise, and crop raiding is one of the biggest issues globally. Several huge species, including elephants and wild boars, which consume a lot of crops and pose a threat to people, are most common in mountainous and hilly areas. The proposed system helps by using sensor detection to keep an eye on current events using PIR and ultrasonic sensors, as well as a Node MCU to deliver active external mitigation to prevent animals from entering farms. The IFTTT software platform also aids in Node MCU's ability to alert farmers via text message. Hence, the system offers total control over stopping and changing farmers at the same time without requiring any human contact, even at night.

[3] Dias, J., Save, M., Chaudhari, S., & Churi, Y. (2022).

IoT-based smart farming, crop protection, and fertiliser forecasting. IoT sensors send data about agricultural fields, which are then acted upon based on input from the user. The idea of "smart agriculture" is developing. The creation of a system that can track temperature, humidity, moisture, and crop security is one of this project's aspects. The optimum fertiliser will be advised based on the soil type, moisture content, temperature, season, and recommended season so that the right nutrients may be maintained by applying only the necessary amount of fertilisers, which will also boost the soil's production. In order to safeguard the crop from animals, the motion sensor will sound an alarm or buzzer if it detects any unwelcome motion. To create the suggested solution, a distributed wireless sensor network will be set up (WSN). The functions are carried out by connecting the Arduino to the Wi-Fi, GSM, and sensor modules. By decreasing human labour and water waste and providing farmers with real-time reports on the state of the industry via mobile devices, the proposed work addresses current issues with farming.

[4] Nanda, I., Sahithi, C., Swath, M., Maloji, S., & Shukla, V. K. (2020, November).

IOT-based smart irrigation and crop protection system. There will be an integrated method in the IIOT space created for perceptive agriculture that is moving forward with the arrangements using open source software and low-power hardware. The goal of this project is to produce a monitoring system for farm security against animal attacks and climate change circumstances. Smart farming typically makes use of Industrial Internet of Things (IIoT) advancements to highlight the standard of agricultural.

[5] Navaneetha, P., Devi, R. R., Vennila, S., Manikandan, Saravana,(2020) .

IOT-based crop protection against attacks from wild animals and birds. Our project's primary goal is to prevent animal damage to crops while also diverting animals away from harm's way. Farm crops are frequently destroyed by neighbourhood animals including buffalo, cows, goats, birds, etc. For the farmers, this results in enormous losses. Farmers cannot block entire fields or remain on the field all day to secure it. Hence, we suggest a mechanism for automatically protecting crops from animals. A system for detecting animals is intended to alert users of their presence. PIR and ultrasonic sensors were utilised in this project to provide signals to the controller and detect animal movement. By creating sound and a signal that is further transferred to GSM, it diverts the animal. This alerts the forest department and farmers right away.

### III. EXISTING SYSTEM

In the existing system, Both electric fences and conventional fences are used to keep animals away from crops. The crop fields must be protected by human labour. Just the forest officer receives messages; the inhabitants of the property are not included. digging or trenching the ground a few feet deep around the fence wire. The biggest drawback of this technique is the potential danger that electric fences pose to people and domestic animals. Not just animals but also humans could be harmed by trenching if they were to fall into it. The folks who are in the immediate vicinity of the field are not captured on camera.

### IV. PROBLEM DEFINITION

Animal attacks are a typical occurrence these days in India. These attacks kill locals and ruin their crops because there is no detection system in place. These villagers are left defenceless against their fate due to a lack of adequate protection measures. Hence, a good detection system could contribute to both the preservation of crops and the saving of their lives. Also, villagers' crops are ruined as a result of animals' constant meddling. Farmers' attitudes about animals have undergone a significant shift as a result of the escalating rate of forest loss and the encroachment of agricultural land. The coexistence of farm animals with wild animals appears to be next to impossible.

## V. PROPOSED SYSTEM

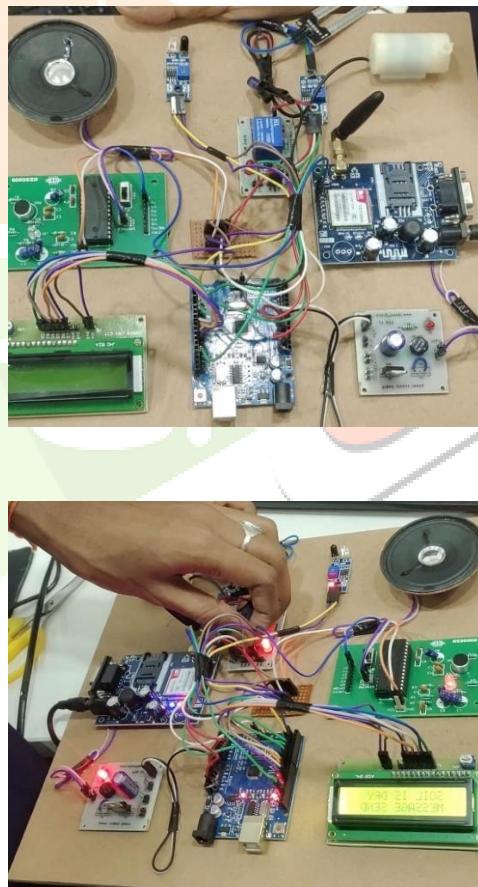
Animals are currently causing farmers a lot of problems by eating their crops, and agricultural fields are having a lot of issues because there aren't enough water resources. Smart irrigation systems have been employed to assist farmers in overcoming their challenges. The input pins of the Arduino microcontroller are connected to a variety of sensors in this system, including an Infrared sensor and soil moisture sensors. Infrared sensors are used to find the animal. If an animal is found close to an agricultural area, a speaker will emit an animal sound. The sensors' sensed values are shown on the LCD. The farmer will be informed about the current field condition using the GSM module if the sensed value exceeds the threshold values established in the programme. The farmer can access information about the state of the field at any time and from any location by using this system.

## IV. RESULTS AND DISCUSSION

### 4.1 Testing and Evaluation

Moisture level of the soil can be tested by soil moisture sensor and the pump gets ON automatically when the soil is detected dry. Obstacle detection can be done by IR sensor which allows the Animal to stop when the obstacle is detected nearby. User could able to check whether the voice commands are given properly by checking the commands that are displayed on the mobile phone.

### Figures



**Fig 1** Final output

## V. CONCLUSION & FUTURESCOPE

This system claims that irrigation systems become more independent with IOT's rapid data transmission. The primary benefit of IOT is that data is sent even when clients are not connected to the node network, and whenever a client is connected to that node, they are able to view the data that has already been sent. So that they can analyse the daily changes in the atmosphere and increase crop production. Also, this technique will assist them in increasing crop production, which will benefit their economic security.

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