

BUDDHIMAN KRISHI ANUVADHANAM:

A New Hope for Better Agriculture System

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Abstract- The Agriculture Monitoring System addresses pressing challenges in contemporary farming, notably ineffective soil moisture management and persistent threats of animal intrusion. Recent statistics indicate a global agricultural loss of 20% due to suboptimal soil moisture practices and animal-related damages. Existing monitoring systems fall short in providing a holistic solution, resulting in significant economic losses for farmers. In response, the proposed system integrates advanced technologies, including precise soil moisture sensors, infrared (IR) sensors for animal detection, and real-time visual monitoring via an ESP32 camera. Farmers can also monitor and control irrigation pumps and electric shock generators through their smartphones. This comprehensive approach aims to minimize yield losses, optimize resource utilization, and empower farmers with actionable insights for informed decision-making. By bridging critical gaps in agricultural monitoring and protection, the Agriculture Monitoring System emerges as a transformative solution with the potential to revolutionize and fortify global farming practices.

strategy for boosting food production, resource management, and labour is smart farming.

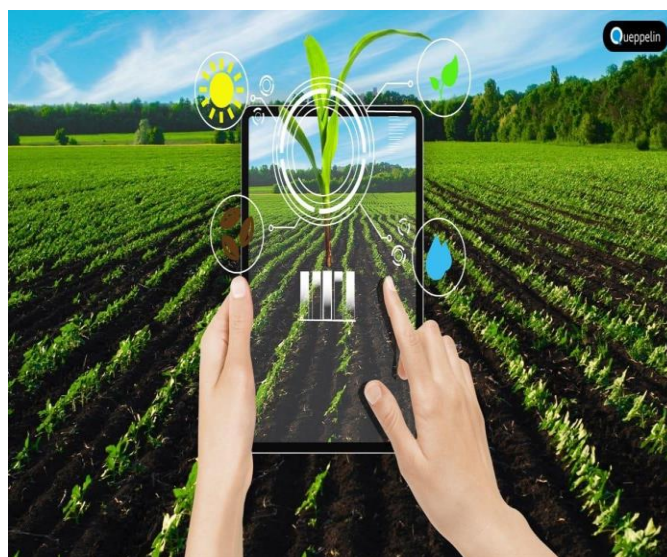


Fig 1: Agriculture Field

1.INTRODUCTION

The increase in world population requires improved production to provide food in all areas, especially in agriculture. However, there are instances when demand and supply are not balanced. Improving agricultural output still faces significant challenges in managing and retaining personnel and capital. A superior choice for enhancing food production, resource management, and labour is smart farming. The increase in world population requires improved production to provide food in all areas, especially in agriculture. However, at certain times, supply and Demand won't equal supply. Improving agricultural output still faces significant challenges in managing and retaining personnel and capital. A superior

The IoT based farming system helps the farmer to monitor various parameters in his field such as humidity, temperature, and soil moisture using certain sensors. Farmers can use certain sensors to monitor various conditions in the field, such as soil moisture, temperature, and humidity, using an IoT based farming system. Even when far from their fields, farmers can use the web or mobile app to track all sensor information. One of the essential tasks of farmers is to water their crops. By monitoring sensor parameters and managing the pump motor from the mobile app, they can decide whether to water crops or delay watering.

2.PROBLEM STATEMENT

Modern agriculture faces challenges related to outdated monitoring systems that fail to provide real-time data crucial for decision-making. The absence of effective solutions for animal intrusion and the lack of centralized control for irrigation further compound these challenges.

This section delves into the existing issues and emphasizes the need for a more holistic approach.



Fig 2: Animals Destroying the crops

3.OBJECTIVES OF THE PROJECT

The main objective of the proposed system is,

- Implement comprehensive soil moisture monitoring for efficient irrigation management.
- Develop timely animal detection and alert mechanisms for farm security.
- Create a user-friendly application interface for remote control of irrigation pumps and electric shock generators, alongside real-time visual monitoring capabilities.

4.METHODOLOGY

Automation refers to the process of using technology to perform tasks with minimal human intervention. It involves the design, implementation, and control of systems and processes that operate autonomously or semi-autonomously, reducing the need for manual labor and increasing efficiency, accuracy, and reliability.



Fig 3: Automation

The methodology for the Agriculture Monitoring System involves a meticulously planned integration of sensors, controllers, and communication devices.

Sensors continuously measure the soil's moisture content and transmit real-time data to the microcontroller, which processes humidity and temperature data received from the sensors. Infrared (IR) sensors are deployed along the fence perimeter of the agricultural field to detect animals. The microcontroller controls the electric shock generator and irrigation pump, turning them on and off using a relay module. Additionally, a camera is used for visual monitoring around the fence.

5.BLOCK DIAGRAM

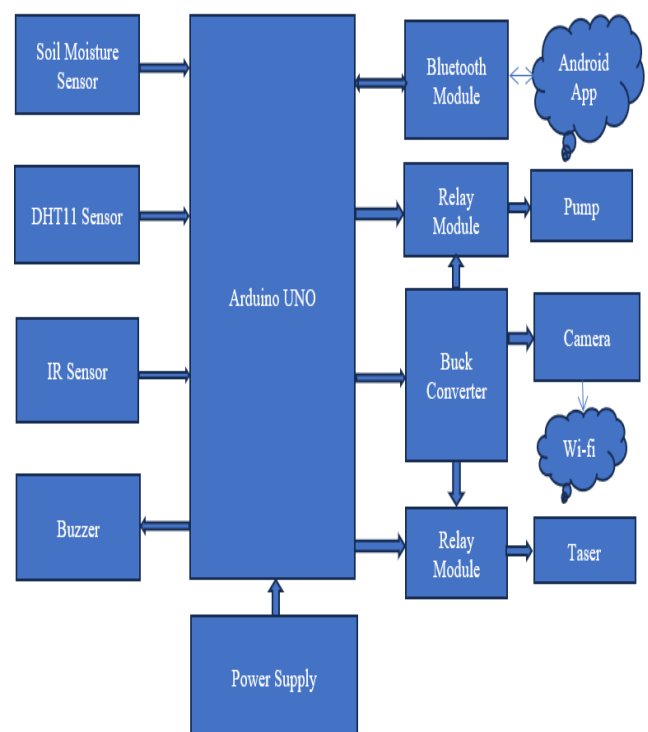


Fig 4: Block diagram of system

6.WORKING

In this integrated system, a combination of sensors including a soil moisture sensor, DHT11 sensor, and IR sensor gather environmental data. The Arduino microcontroller processes this data, determining actions such as activating a pump for watering plants based on soil moisture levels. Additionally, the IR sensor detects the animals around the area, triggering a taser for security measures if unauthorized movement is detected. A buzzer provides audible alerts for animals, while a Bluetooth module enables remote monitoring and control via a smartphone app. A relay module facilitates the control of high voltage devices such as the pump and taser by smartphone app. Furthermore, a camera captures images

or video footage upon motion detection for surveillance purposes. Through the integration of these components and programming within the Arduino IDE, the system offers automated plant care, security monitoring, and remote-control capabilities.

7.CONCLUSION

By incorporating soil moisture monitoring, animal detection alerts, and user-friendly remote-control features, our system offers a holistic solution for agricultural efficiency and security. With automated functionalities, it streamlines plant care and surveillance, ensuring optimal irrigation and timely response to potential threats. The integration of these components not only enhances operational efficiency but also minimizes manual labor and risk factors associated with traditional farming practices. Overall, this integrated system represents a significant advancement in agricultural technology, catering to the diverse needs of farmers and empowering them with greater control and peace of mind.

8.REFERENCES

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