IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 1, July 2025
Impact Factor: 7.67

Agri Sensor with Internet of Things

Prachi Lilhare, Prajakta Kamble, Muskan Gupta, Rani Gopewar, Sumaiya Baig
Department of Information Technology
Govindrao Wanjari College of Engineering & Technology, Nagpur

Abstract: *Technological precision is essential for efficient resource management in both agriculture and domestic applications. By utilizing real-time water level sensors, the Water Tank Overflow Alert System ensures users are notified when tanks are full, reducing water waste. Likewise, the Animal Intrusion Detection System detects unauthorized animal entry and alerts farmers to prevent crop damage. These solutions combine IoT and automation, improving productivity, sustainability, and efficiency in contemporary farming-practices.*

Keywords: Agri Vision AI, Livestock Surveillance, Smart Aqua Flow, Hydro Sense Monitoring, IoT Aquatic Control.

I. INTRODUCTION

Wild animals such as boars, elephants, and monkeys have become a growing threat to farmlands, causing significant crop damage and financial losses for farmers. To address this issue, a smart Raspberry Pi-based system is proposed, utilizing RFID and GSM technologies. RFID tags embedded in animals and field-installed readers detect intrusions, triggering alerts to forest officers and farmers. Additionally, PIR sensors detect body heat and movement, activating deterrents like sound or fog only when necessary. This automated system helps protect crops, reduces human-animal conflict, and ensures humane wildlife management.

The automatic water level controller is a cost-effective solution that efficiently manages water usage by automatically operating the water pump based on the water level in tanks. It employs sensors and digital technology to turn the pump on when water is low and off when the tank is full, thereby preventing water wastage, avoiding motor dry running, and reducing energy consumption. The system ensures a continuous water supply, extends motor life, and can be customized for multiple tanks or pumps, making it ideal for homes and institutions.

Humidity and temperature sensors play a crucial role in smart farming by monitoring and controlling environmental conditions. Temperature sensors help determine optimal times for planting and harvesting, detect frost, and maintain ideal greenhouse temperatures. Humidity sensors monitor air and soil moisture, helping to prevent plant diseases and improve irrigation efficiency.

Used an LDR (Light Dependent Resistor) sensor to automatically detect when compost is ready. During decomposition, low light levels indicate that the compost is still in process. When the compost is done, increased light is detected by the LDR, which signals a microcontroller to alert the user through a light, buzzer, or display. This system is automatic, affordable, and eco-friendly, eliminating the need for manual checking.

II. METHODOLOGY

Smart agricultural systems use technologies like RFID, PIR, LDR sensors, and microcontrollers to improve efficiency and promote eco-friendly farming. Animal detection systems alert farmers and activate deterrents to protect crops from wild animals. Automatic water level controllers manage pump operation to prevent water wastage and save energy. LDR-based compost monitors detect when compost is ready, reducing the need for manual checks. These systems make agriculture more efficient, sustainable, and user-friendly.

An easy way to comply with the Journal paper formatting requirements is to use this document as a template and simply type your text into it.

DOI: 10.48175/IJARSCT-28431

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 1, July 2025
Impact Factor: 7.67

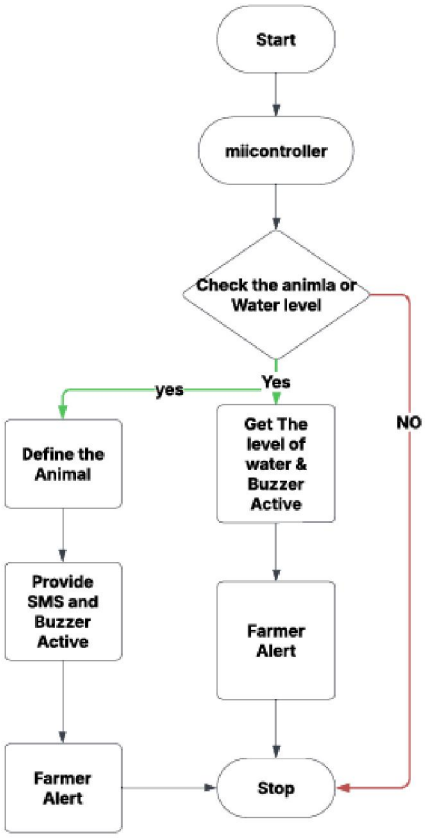
- Microcontroller W78E052DDG : A microcontroller manages sensor data, processes it, and performs actions like alerts and automation, making it essential for real-time monitoring in animal detection, water level control, and insect detection systems.
- LDR sensor: An LDR sensor detects changes in light intensity and is used in systems like automatic lights and insect detection in storage areas.
- GSM Modouls : A GSM module is used to send and receive messages or calls over a mobile network. In smart systems, it provides real-time alerts to users, such as notifying farmers about animal intrusions or water level updates.
- Humidity and Temperature Sensor : A humidity and temperature sensor monitors environmental conditions to help maintain healthy crop growth in farming.
- PIR Sensor : A PIR sensor detects motion from animals or humans and is used in farms to identify wild animal intrusions.

Software Requirement:

- Embedded C language
- Keil U Software
- MySQL

III. PROPOSED SYSTEM

Figure 1 : Agri Sensor with Internet of things



IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 1, July 2025
Impact Factor: 7.67

IV. RESULT & DISCUSSION

This is the complete model of our project. This approach provides an automated, real-time solution to safeguard crops and minimize financial losses for farmers.

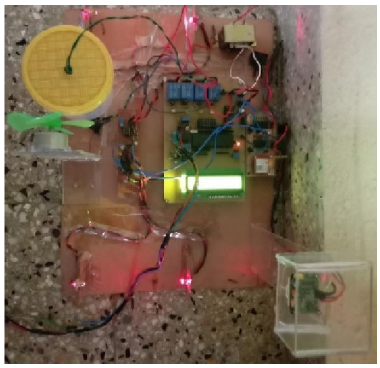


Figure 2. Agri Sensor With IOT

This is the output for the Animal Detection. This system helps protect crops and keeps people and animals safe.

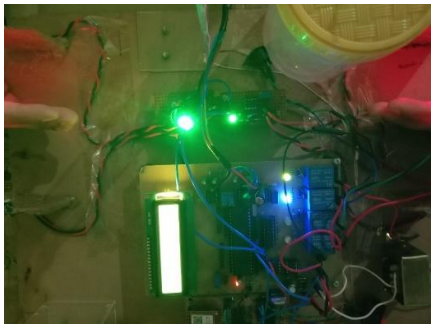


Figure 3. Animal Detection

In figure 8.2 shows that an animals enter farms and destroy crops, causing losses to farmers. To stop this, a smart system using Microcontroller, RFID, and GSM is used. When tagged animals enter, the system detects them and sends alerts to farmers and forest officers. It also uses sound and smoke to scare the animals away. PIR sensors are also used to detect animals by body heat. This system helps protect crops and keeps people and animals safe.

Figure 4. Water Tank

An automatic water level controller is a system that turns the water pump on or off based on the water level in the tank. It stops the pump when the tank is full and starts it when the water is low. This saves water, prevents the motor from running dry, and uses less electricity. It uses sensors to check water levels and works for both underground and overhead tanks. It's a smart, low-cost solution for homes and buildings

This project uses an LDR sensor to check if insect compost is ready. When the compost is still being made, it stays in a dark place, so the sensor sees less light. When the compost is ready, more light reaches the sensor. Then, the system gives a signal like turning on a light or buzzer to let the user know.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 1, July 2025
Impact Factor: 7.67

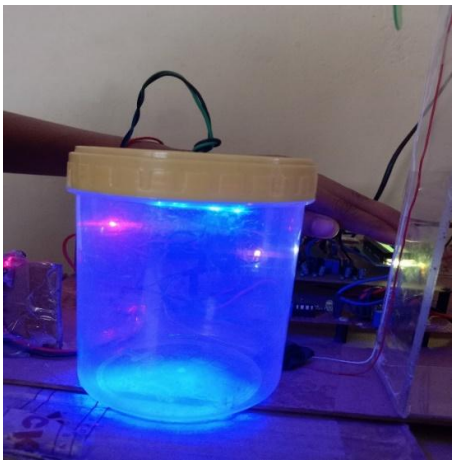


Figure 5. Insect Compost

V. CONCLUSION

Agri sensors with IoT are powerful tools that make farming more efficient and eco-friendly. They help solve major problems like wild animal intrusions, water wastage, and insect detection by providing real-time monitoring and alerts. A third function is the use of an LDR (Light Dependent Resistor) sensor, which can detect insects entering a storage box by sensing changes in light levels.

These systems improve farm safety, save resources, reduce costs, and help monitor crop storage conditions. As technology advances, these sensors will become even smarter, helping farmers face challenges, protect their land and produce, and support environmental sustainability. They are practical and essential for modern farming, offering smart solutions for better farm management and sustainable agriculture worldwide.

REFERENCES

[1]. S. Santhiya, Y. Dhamodharan, N. E. K. Priya, C. S. Santhosh, and M. Surekha, "SmartFarmland Using Raspberry Pi Crop Prevention and Animal Intrusion Detection System," Int.Res. J. Eng. Technol., 2018.

[2]. V. R. Yazhini and C. Vijayalakshmi, "a Semi Automatic Crop Monitoring System for Empowerment of India," vol. 25, no. 5, pp. 13–16, 2018.

[3]. A R. Rajan, "Animal Intrusion Detection System Using Wireless," vol. 2, no. 10, 2016.

[4]. R. Shanmugasundaram, S. Pavithra, V. Sangeetha, S. Tamilselvan, and A. H. T. Ahmed, "Iot Based Animal Tracking and Monitoring System in Zoo," South Asian J. Eng. Technol., vol. 3, no. 2, pp. 162–168, 2017.

[5]. Nahatkar Sneha, Gaur Avinash, and Pattewar M Tareek, "Design of a Home Embedded Surveillance System with Pyroelectric Infrared Sensor & Ultra-Low Alert Power," International Journal of Advanced Research in Electronics and Communication Engineering, Sep. 2012. http://ijarece.org/wp-content/uploads/2013/08/IJARECE-VOL-1-ISSUE-3-86-90.pdf (accessed Oct. 02, 2021).

[6]. R. S. Sabeenian, N. Deivanai, and B. Mythili, "Wild animals intrusion detection using deep learning techniques," Int. J. Pharm. Res., vol. 12, no. 4, pp. 1053–1058, 2020, doi: 10.31838/ijpr/2020.12.04.164.

[7]. N. Banupriya, S. Saranya, R. Jayakumar, R. Swaminathan, S. Harikumar, and S. Palanisamy, "Animal detection using deep learning algorithm," J. Crit. Rev., vol. 7, no. 1, pp. 434–439, 2020, doi: 10.31838/jcr.07.01.85.

[8]. M. A. Abu, N. H. Indra, A. H. A. Rahman, N. A. Sapiee, and I. Ahmad, "A study on image classification based on deep learning and tensorflow,"

[9]. Y. Kondratenko, O. Korobko, O. Kozlov, O. Gerasin, and A. Topalov, "PLC based system for remote liquids level control with radar sensor," in 2015 IEEE 8th International Conference on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications (IDAACS), vol. 1. IEEE, 2015