International Journal For Advanced Research In Science & Technology
A peer reviewed international journal www.ijarst.in
ISSN: 2457-0362

# CROP SHIELD SYSTEM

[1]DR.N JEGADEESAN, [2]A.SOWMYA , [3]B.SHRAVYA, [4]D.APOORVA

[1]Assistant Professor, Department of Electronics and Communication Engineering, Malla Reddy Engineering College For Women, Maisammaguda, Dhulapally Kompally, Medchal Rd, M, Secunderabad, Telangana.

[2,3,4]Student, Department of Electronics and Communication Engineering, Malla Reddy Engineering College For Women, Maisammaguda, Dhulapally Kompally, Medchal Rd, M, Secunderabad, Telangana.

## ABSTRACT

Agriculture has always been the primary and most important sector of the Indian economy. Farmers are the backbone of one's country. Farmers are unable to monitor their fields around the clock, and when they are away, they cannot protect their farms. This can negatively impact crop yield, as animals like buffaloes, crows, or even wildlife from nearby forests may enter the fields and cause damage. There are many loopholes in such ideas and so improvising agricultural security has become a major issue these days. Thus, this project focuses on proposing a system that detects intruders, monitors any suspicious activity and then reports to the owner of the field with the Upon detecting an animal entering the fiekld, the PIR sensor and Arduino Traditional systems, such as humanoid scarecrows, are still commonly used in agricultural fields to deter birds and animals from feeding on crops. However, these methods have several limitations, and enhancing agricultural security has become a growing concern. This project proposes a system designed to detect intruders, monitor suspicious activities, and notify the landowner. It is an adaptable solution that offers farmers a practical way to ensure the protection of their farmlands from trespassing or potential threats.

## I. INTRODUCTION

The science, art, and practice of producing plants and keeping animals for food, energy, fiber, and other things is known as agriculture. It encompasses a variety of tasks, including preparing the soil, planting, watering, fertilizing, controlling pests and diseases, harvesting, storing, and marketing crops, as well as taking care of and managing livestock. Since the beginning of civilization, agriculture has been essential to human communities, and it still plays a significant part in feeding the world's population and supplying raw materials for industry. With the invention of new technology, techniques, and systems that have raised yields, enhanced efficiency, and lessening the environmental effect of farming, the practice of agriculture has experienced considerable changes throughout history. On an area of land, farming involves planting crops and raising animals for food, fiber, and other items. Preparing the land, planting crops, taking care of livestock, and collecting produce or animal products are just a few of the many tasks involved. Providing food and raw materials for many industries, farming has been a fundamental activity for human society for thousands of years. Traditional small-scale subsistence farming, large-scale commercial farming, and specialized

farming techniques like organic farming or hydroponics are just a few of the several ways that people engage in farming. Individual farmers, families, or members of a bigger agricultural business or cooperative are all possible employment arrangements for farmers. Modern farming frequently makes use of cutting-edge machinery and technology to increase productivity and yields while reducing its negative environmental effect.

## III.LITERATURE SURVEY

**Anubhav Gulati, Sanjeev Thakur "Smart Irrigation Using Internet of Things" 2018 8th International Conference on cloud computing,Data science Engineering**

India is an agricultural country and 70% of the people directly or indirectly depend on agriculture for their living. Nowadays, water scarcity is one of the main challenges faced by the farmers. Another major challenge faced by Indian agriculture sector is the increase in rate of farmers suicide because of debt. So, effective measures have to be devised in order to reduce the cost of farming and increase the yield from agriculture. As water supply is becoming scarce in today's world there is an urgency of adopting smart ways of irrigation. The project describes how irrigation can be handled smartly using IOT. This project aims at saving time and avoiding problems like constant vigilance. It also helps in conserving water by automatically providing water to the plants/field depending on the water requirements. This system can also prove to be helpful in agriculture, parks and lawns. The objective of this system is to detect the moisture content of the soil and depending on it sprinkle water. This entire information will be sent to the user's mobile phone. Agriculture plays vital role in the development of agricultural country. InIndiaabout 70% of population depends upon farming and one third of the nation's capital comesfrom farming. Issues concerning agriculture have been always hindering the development ofthe country. The only solution to this problem is smart agriculture by modernizingthecurrent traditional methods of agriculture. Hence the project aims at making agriculturesmart using automation and IoT technologies. The highlighting features of this project includes smart GPS/GSM based remote controlled system to performtasks like weeding,

moisture sensing, fertilizing sensing, keeping vigilance, etc. Secondly it includes smart irrigation with smart control and intelligent decision making based on accurate real timefield data. Thirdly, smart warehouse management which includes temperature maintenance, humidity maintenance and water detection in the warehouse. Controlling of all theseoperations will be through any remote smart device or computer connected to Internet andthe operations will be performed by interfacing sensors. Water is the important source in human life. Around 80 % to 90 %water usedinagriculture field. As due to day-by-day growth in globalization and populationwaterconsumption is also increases. Today automation is one of the important roles in agriculturefield. Agriculture is the primary occupation in our country. India's major income sourceisdepending on agriculture therefore the development of agriculture is important. Intodayalso most of the irrigation systems are operated manually. The available traditional techniques are like drip irrigation, sprinkler irrigation etc. By the use of Drip Irrigation, wecan save water and fertilizer provided to the crops. Whenever there is a changeintemperature, humidity and current status of rain of the surroundings these sensors sensethechange in temperature and humidity and gives an interrupt signal to the controller. Thisproject focuses primarily on reducing the wastage of water and minimizing the manual labor on field for irrigation so that you can save time, cash and power of the farmer. Latest technologies such as Internet of Things and Cloud in combination with Wireless SensorNetworks can lead to agricultural modernization. IoT is an ecosystem of connected physical devices that is accessible through the Internet. It consists of objects, sensor devices, communication infrastructure, computational and processing units. The sensors will communicate the information over the Internet to the cloud server whichisa computational and processing unit.

**Christian Dimkpa, P.S Bindraban, Joan E Mclean, Lydiah Gatere "Methods for Rapid Testing of Plant and Soil Nutrients", IEEE 4th International Conference, 2017**

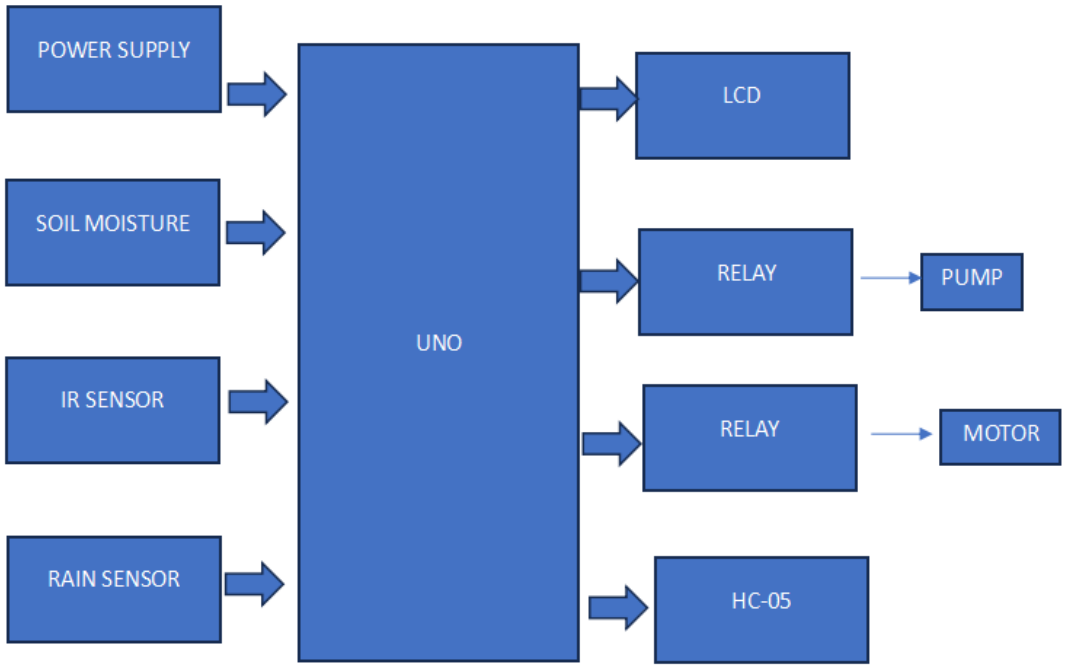
Agriculture is the backbone of India. Fertilizers play a key role in the agricultural yield. A key problem faced by the farmers is lack of knowledge on the amount of fertilizers to be used. Farmers think that higher the fertilizer used, greater the productivity. But it is not correct, the soil uses the exact

amount it needs and leaves the rest. Over utilization leads to leaching and decrease in the natural soil fertility and many such problems. A solution is provided by allowing the farmers to test their lands and use the fertilizer as per the soil's need at an affordable cost. This work gives a report about the design of cost efficient soil nutrients detection using pre-prepared capsules. Here test can be performed for three different types of nutrients Sodium, Potassium and Phosphorous. Here three test tubes are taken and each one is filled with certain amount of soil and water, and then the mixture is shaken for 15 minutes. Then there occurs a color change in the tube. Here a color sensor is used and the color change in the test tubes is detected by the sensor and compared with the existing information about color-deficiency. Sensory data is processed using Arduino and then information about the deficiency and amount of fertilizer needed to overcome the deficiency is given to the farmer. Agriculture along with its allied sectors is the largest source of livelihood for the people of India. 70% of India's rural households primarily depend on agriculture for their bread and butter. 82 % of the farmers in India are small and marginal. In 2017-2018, the total food grain production in India was 275 million tons (MT)[1-3]. According to the Economic Survey 2017–2018, agriculture sector has contributed about 16% to India's GDP. Agriculture sector's contribution to Indian economy is much higher than that of world's average which is 6.4%. Agriculture's contribution in India was decreased to 4861 Billion Rupees in the first quarter of 2019 from 5869 Billion Rupees in the fourth quarter of 2018. In India GDP from agriculture averaged 4135 Billion Rupees from 2011 until 2019, reaching an all time high of 5870 Billion reaching in the fourth quarter of 2018 and a record low of 2691 Billion Rupees in the third quarter of 2011. Small, medium and marginal land holdings in agriculture are very important for raising food security, agriculture growth and for improving the economy in India. They contribute to 80% of Indian agriculture. In direct words, the future of agriculture growth and food security of our country depends on the performance of these small, medium and marginal farmers. The Agriculture Census in the year 2000–2001, showed that 121 million agricultural holdings exist in India. Among these, around 99 million of holdings were small and marginal. In 1970-1971 year the average land holing

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
ISSN: 2457-0362

size per person is 2.3 hectares. By 2000-2001 it is reduced to 1.37 hectares. There are significant land inequalities in India. As much as 67% of India's farmland is under the marginal farmers with holdings below one hectare whereas less than 1% in large holdings of 10 hectares and above, the latest Agriculture Census shows. As per the census out of the total 64.57 million hectares of net irrigated area, 48.16% is accounted by small and marginal holdings, 43.77% by semimedium and medium holdings and 8.07% by large holdings.

**Block diagram**




## IV.PROPOSED SYSTEM

The proposed system for the **Crop Shield System** aims to provide an automated protective solution for crops against adverse weather conditions, specifically rainfall. The system is designed using an embedded rain sensor that detects precipitation and triggers an automatic response mechanism to safeguard crops. The core component of the

system is a **motorized retractable shed** that covers the crops when rain is detected. The rain sensor continuously monitors the weather and, upon sensing rainfall, sends a signal to a microcontroller. The microcontroller processes this data and activates the motor, which unfolds the protective shed over the crops. Once the rain stops, the sensor relays this information to the microcontroller, which then retracts the shed, allowing sunlight to reach the crops.

This system operates autonomously, requiring minimal human intervention, and can be deployed in open fields or small farms. The shed is constructed using durable, weather-resistant materials to ensure longevity, and the motorized mechanism is designed for energy efficiency. Additionally, the system can be integrated with IoT technology to enable remote monitoring and control via mobile devices, allowing farmers to manage the system from a distance. By automatically shielding crops during rainfall, this system ensures that crops are protected from excess water, which can prevent soil erosion, crop damage, and fungal infections, thereby improving overall crop yield and health.

## V.CONCLUSION

Crop security from animal encroachment is a crucial factor for successful crop growth, especially in rural India where animal hazards pose serious challenges to farmers. With no existing remedy for this problem, there is an urgent need to address this issue, which has enormous societal relevance. While the suggested solution does not entirely resolve the challenges that farmers face, it guarantees that farmers will receive prior warnings of animal attacks and prevent crop loss. Protecting agriculture, as the foundation of the Indian economy, is our responsibility. In addition to crop security, the study also identified a quick and effective method for determining soil moisture content. The irrigation system can detect low soil moisture levels automatically, irrigating the plants accordingly. Through this research, various sensor types, Arduino boards, their uses, and how to operate them have been better understood, highlighting the potential for future agricultural innovations. This project demonstrates a practical application of technology to address real-world agricultural challenges, emphasizing the importance of innovation and adaptation in agricultural objectives.

## VI.REFERENCES

[1] Anubhav Gulati, Sanjeev Thakur “Smart Irrigation Using Internet of Things” 2018 8th International Conference on cloud computing,Data science Engineering

[2] Christian Dimkpa, P.S Bindraban, Joan E Mclean, Lydiah Gatere “Methods for Rapid Testing of Plant and Soil Nutrients”, IEEE 4th International Conference, 2017

[3] Courtney Pariera Dinkins, Clain Jones “Interpretation of Soil Test Reports for Agriculture”, Montana State University, Self-Learning Resources, 2013

[4] Damini Kalra, Praveen Kumar, K. Singh, Apurva Soni “Sensor Based Crop Protection System with IoT monitored Automatic Irrigation” 2nd International conference on Advances in Computing, Communication Control and Networking, 2020.

[5] Dr. A. Cottenie “Soil and Plant Testing as a Basis of Fertilizer Recommendation” FAO Soils Bulletin 38/1, Soil and Plant Testing and Analysis, 1980.

[6] Eka maulana, .Animal presence detection for elephants and extruding method based on bee frequency,IEEE,2018. V. Deshpande, "Design and implementation of an intelligent security system for farm protection from wild animals," International Journal of Science and Research, ISSN (Online), pp. 2319–7064, 2016.

[7] Kavya monisha.k; aishwtional jourarya.d, International journal of advanced research, ideas and innovations in technology,volume 4, issue 5 ISSN:2454-132,april 2012.

[8] K. Pernapati, "IoT Based Low Cost Smart Irrigation System," 2018 Second International Conference on Inventive Communication and Computational Technologies(ICICCT), Coimbatore, 2018, pp. 1312-1315, doi: 10.1109/ICICCT.2018.8473292.

[9] K. Rao, R. Maikhuri, S. Nautiyal, and K. G. Saxena, "Crop damage and livestock depredation by wildlife: a case study from nanda devi biosphere reserve, india," Journal of Environmental Management, vol. 66, no. 3, pp. 317– 327, 2002.

[10] Kshama S.Bhise, International Journal of Scientific & Engineering Research, Volume 7, Issue 2, February-2016 ISSN2229-5518.

[11] Madhu.b, smart agriculture: a bliss to farmers, international journal of engineering sciences and research technology, ISSN:2277-9655, APRIL,2017

[12] Mary Pletsch Jones "Evaluating Nutrient Availability in Low Fertility Soils with Resin Capsules and Conventional Soil Tests", BYU Scholar Archives, All Theses and Dissertations- 3049, 2011.

[13] M. Jaya Prabha, R. ramprabha, V VasuBindhra, C. AshaBeula "Sart Crop Protection System From Animals" International Journal of Engineering and Advanced Technology ISSN: 2249-8958, Vol.:9, Issue: 4 april,2020