International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 08 Issue: 03 | March - 2024 SJIF Rating: 8.448 ISSN: 2582-3930

KRISHI MITRA – A SMART FARMING SYSTEM THROUGH AI

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I.ABSTRACT

The concept of smart agriculture is still in its infancy, since Internet of Things (IOT) sensors may gather data about agricultural fields and behave accordingly based on human input. The development of a smart agriculture system that takes advantage of cutting edge technologies like Arduino, IOT, and wireless sensor networks is suggested in this paper. The goal of the article is to employ automation and emerging technologies, such as IOT and smart agriculture. One of the main ways to increase the production of productive crops is to monitor the surrounding conditions. This paper's highlight is the development of a system that uses sensors utilizing an Arduino board to monitor temperature, humidity, moisture, and even the movement of animals that could kill crops in agricultural fields. If there is any disparity, the system will be notified.

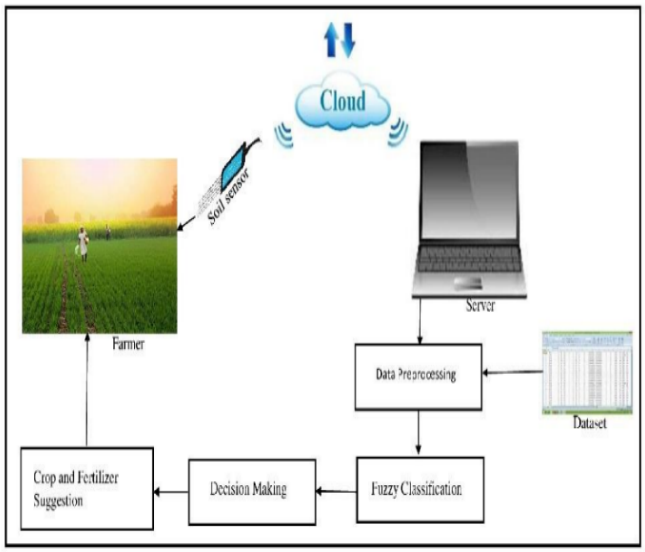
II. INTRODUCTION

The main industry in India is agriculture. 58% of Indians who live in rural areas depend on agriculture, according to the India Brand Equity Foundation (IBEF).

According to the Central

According to the second recommended estimate from the Statistics Office, agriculture contributes a significant 8% of India's GDP, or about, to the country's total value added. In such a scenario, agriculture would use a significant amount of water, particularly freshwater resources. Current market surveys estimate that agriculture uses 85% of the freshwater resources available worldwide, and this percentage will continue to be dominant due to population growth and rising food demand. This necessitates preparation and tactics to make wise use of water by applying the

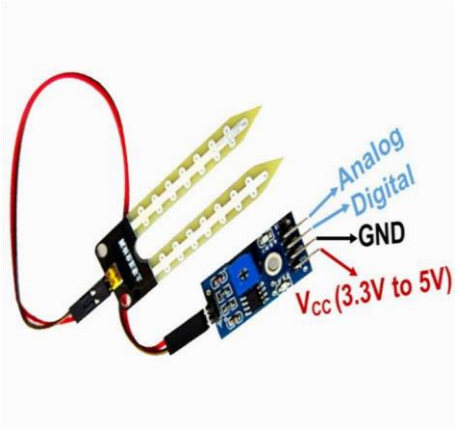
III. PROPOSED METHODOLOGY



IV COMPONENTS

A. Soil Moisture Sensor

When installed and operated correctly, soil moisture sensors (SMSs) reduce water consumption significantly by measuring soil moisture at the root zone and controlling the current conventional irrigation timer. It is possible to have dryer or wetter soil conditions by setting a specific soil water content threshold.



B. ARDUINO IDE

The computer code is created and uploaded to the actual board using the Arduino IDE (Integrated Development Environment). One of the main reasons Arduino got so popular was arguably its extremely simple Arduino IDE.

C. JUMPER WIRES

In electronic prototype and testing applications, male to female jumper wires are used to connect components quickly and easily without the need for soldering. They can connect FRC pins, Header pins, Berg pins, and other components. They are supplied in groups of cables with connectors or pins at each end.

D.USB CABLE

USB 2.0 Type A/B Cable

Utilize it to link any board—Arduino, Mega 2560, 101, or otherwise—to your computer's USB female A port. The length of the cable is about 100 cm. Cable form and color may differ slightly.

V. OBJECTIVES

1. Using machine learning and the IOT model to effectively estimate agricultural production price
2. should include linear regression and random forest for the model to function well
3. combining the outputs of the two machine learning models to create a hybrid model that can make the right decisions
4. In order to successfully integrate the hardware model and retrieve the necessary soil data
5. To successfully offer recommendations for raising crop yields and, consequently, farmer income

VI. APPLICATION AND BENEFITS

Benefits

Using smart irrigation has many benefits that are consistent with the main goals that were previously stated. **Water-Sustainability**

Water usage is optimized by smart irrigation, which minimizes waste and makes sure that every drop is used efficiently. This promotes sustainable farming methods in addition to water conservation. **EnergyEfficient** Energy savings result from efficient water use since less energy is needed to pump and distribute water throughout the fields. This is a start in the right direction toward more ecologically friendly farming methods. Impact on the Environment

Smart irrigation systems help to conserve the environment overall by encouraging sustainable water use and lowering the environmental impact of agriculture.

Enhance Crop Quality

Crop quality is enhanced by regular, appropriate irrigation. The use of intelligent irrigation systems is essential to guaranteeing that crops get the

VII. FUTURE SCOPE

1. The Proposed model can be deployed to analyze vast dataset for all the region of India using highly efficient Deep learning models like transformers in cloud

2. The proposed model can enhance to work as mobile app connected to live cloud, that can be used by the farmers at their location with handy NPK kit

3. The Proposed model can be enhanced to send the report to
the farmer's of different states of India in their regional language by including UNI code library and certification in
the application

VIII. RESULT AND DISCUSSION

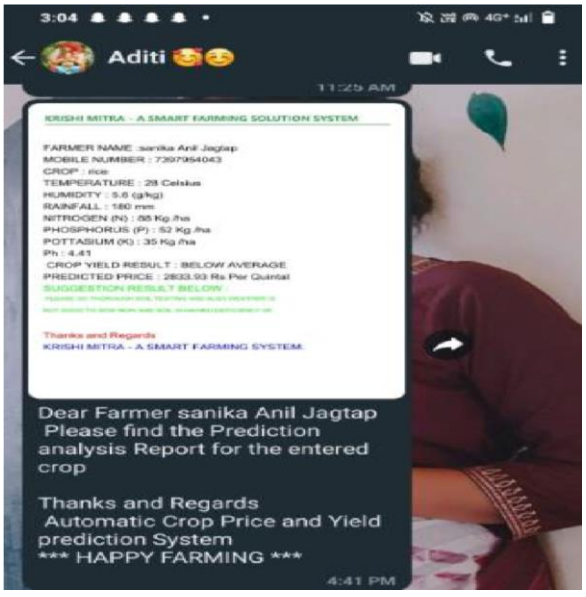
A. Taking soil values

We run our primary program first before starting our project. Following that, values are determined using a soil moisture sensor, which also monitors the temperature and humidity levels, as well as the values of NPK and PH content.The esp32 microcontroller receives the sensor's data, preprocesses it, displays the results as a recommendation report, and uses conditional decision-making to decide which proposal will increase soil efficiency.

B. REGESTRATION FORM

This registration form requests the user's name and Whatsapp number, which was formerly used to instantly give the user a report with recommendations for crops and fertilizers for their farm.
Enter your name and WhatsApp number in this box, then click the "Click Soil Data" button to view the values and soil data.

C. SUGGESTION REPORT



This is the last report with recommendations that we present to farmers based on their farming soil, including suggestions for their future crops and fertilizers.

IX. CONCLUSION

Effective examination of the dataset

Effective application of machine learning methods, such as linear regressions and random forests

The model was successfully integrated to identify the crop production and price characteristics in an effective manner.

The hardware module to extract the NPK values has been deployed successfully.

Generation of a proper proposal report and prompt delivery to the famer

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