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Crop Health Monitoring Using Rasberry Pi and IOT Things

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Abstract: Our main objective is using the IoT sensors provide the real-time status of environmental parameters impacting the crop, and using Raspberry Pi provide the multispectral data used for generating Vegetation Indices (Vis) such as Normalized Difference Vegetation Index (NDVI) to monitor the crop health and environment.

Index Terms: We proposed an integrated system for tomato crop health monitoring by using the Raspberry Pi. We also use Soil moisture sensor, Temperature sensor and Humidity sensor.

I. INTRODUCTION

An agricultural country owing to its natural resources including fertile arable land, favourable climate The associate editor coordinating the review of this manuscript and approving it for publication was Peng Yong Kong conditions and the largest irrigation system in the world [1]. The agriculture sector accounts for 18.5% of Pakistan GDP [2] and has a significant impact on the economy of the country. Despite of all suitable conditions for crops cultivation, Pakistan is still unable to produce surplus yield for national and international market needs. Every year, Pakistan faces a huge loss in the agriculture sector due to several factors such as extreme climatic variations, lack of technology adoption, improper use of major resources like water, fertilizer, and pesticides [3]. The inappropriate utilization of these resources leads to loss of organic content & nutrients in monitoring crop health using IoT, machine learning and raspberry pi technology. The integration of these sensing modalities generate heterogeneous data which not only varies in nature (i.e. observed parameter) but also has different temporal fidelity. The spatial resolution of these methods is also different, hence, the optima integration of these sensing modalities and their implementation in practice are addressed in the proposed system. In our proposed solution, the IoT sensors provide the real-time status of environmental parameters impacting the crop, and the drone platform provide the multispectral data used for generating Vegetation Indices (VIs) such as Normalized Difference vegetation Index (NDVI) for analysing the crop health. The NDVI provides information about the crop based on the chlorophyll content, which offers limited information regarding the crop health. In order to obtain a rich and detailed knowledge about crop health. the crop and a significant reduction in its yield. In order to address these problems, technology-based solutions should be employed to overcome the manual farming practices which are inherently time consuming and laborious. In Pakistan, major crops wheat, rice, maize, sugarcane and cotton are planted on 8.74, 2.80, 1.30, 1.30 and 2.47 million per ha in 2018 to 2019.

II. OBJECTIVES OF SCOPE AND STUDY:

The main objective of this project is to monitor the proper growth of plant agriculture and in turn farmers are the backbone of the Indian economy. Diseases in crop fields lead to production and economic losses for farmers. This has adverse effects on the country's economy. Sometimes farmer miscalculates a fungal or bacterial disease as an insect attack for a particular plant and the disease ends up spreading and destroying acres of field. As they are not aware of various plant leaf diseases and how to avert them. We have implemented a solution to this problem by using a machine learning technique. Early disease detection in crops will be helpful to control the growth of the disease. It is difficult to manually monitor plant leaf diseases and incurs excessive money and time.

So, the main purpose of this project is to help farmers to prevent the disease from exceeding some level where profit or yield is significantly diminished. The project also aims to alert farmers if any of the atmospheric parameters is unfavourable for plant health and growth. The objective of installing an automated system or field serves is to enhance farming efficiency. This approach is suggested for continuously monitoring plant health status and controlling soil parameters i.e temperature, humidity, and moisture. The Automated systems comprise various sensors, control units, and communication units. A sensor circuit will collect this data and monitor it for the farmers. There are number of diseases depending on various sensors, control units and monitor it for the farmers. There are number of diseases depending on various plant spices. The cures for these diseases depending on various plant spices. The cures for these disease are also different. So having the clarity of diseases are most important factor affecting plant health to prevent it. Our proposed system provides one of the controlling action i.e irrigation control for the prevention of diseases, It also provides early diseases detection for crop health and environmental condition monitoring, which is one step towards the digitization of the agricultural sectors in India.

III. LITERATURE SURVEY

Water management currently global problem to all of us to tackle them in near future we need to plan it smartly. As we are living in modern world filled with lots of useful sensors from which we can designed systems with water saving capabilities [1].

From the beginning of time, agriculture has been the most important practise in human society. Traditional irrigation methods, such overhead sprinklers and flood irrigation, are inefficient. They waste a lot of water and may even make people sick by causing fungus growth in the soil due to too much moisture [2]

Smart agriculture is a novel concept since IoT sensors can offer information about agricultural regions and then act on it based on user input. The purpose of this study is to develop a smart agricultural system that utilises cutting-edge technologies such as Arduino, Internet of Things, and wireless sensor networks. [3]

The concept of automating agricultural production has been around since the early 1990s, and one of the primary challenges that both scientists and farmers confront is irrigation.[4]

IV. EXISTING MODEL

They proposed an integrated system for wheat crop health monitoring. The main building blocks of the system are IoT agri nodes communication channel for transmitting data, local server for archiving data and web portal for data visualization.

V. DRAW BACKS

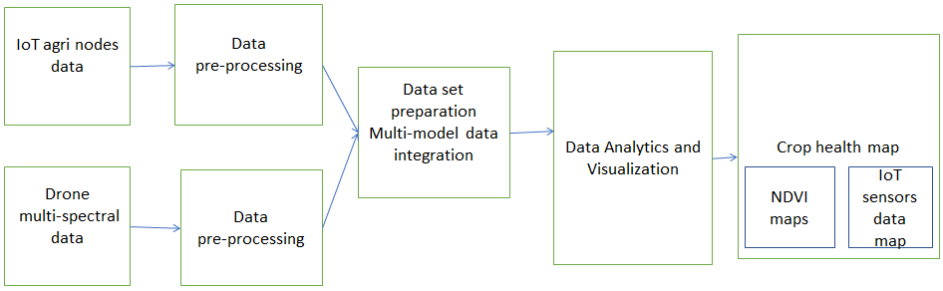
Without internet it cannot be accessed.
It is very sensitive to extreme environment changes and temperature changes.
It deals with the maintenance problem.

VI. FLOW CHART

FLOW CHART EXPLANATION

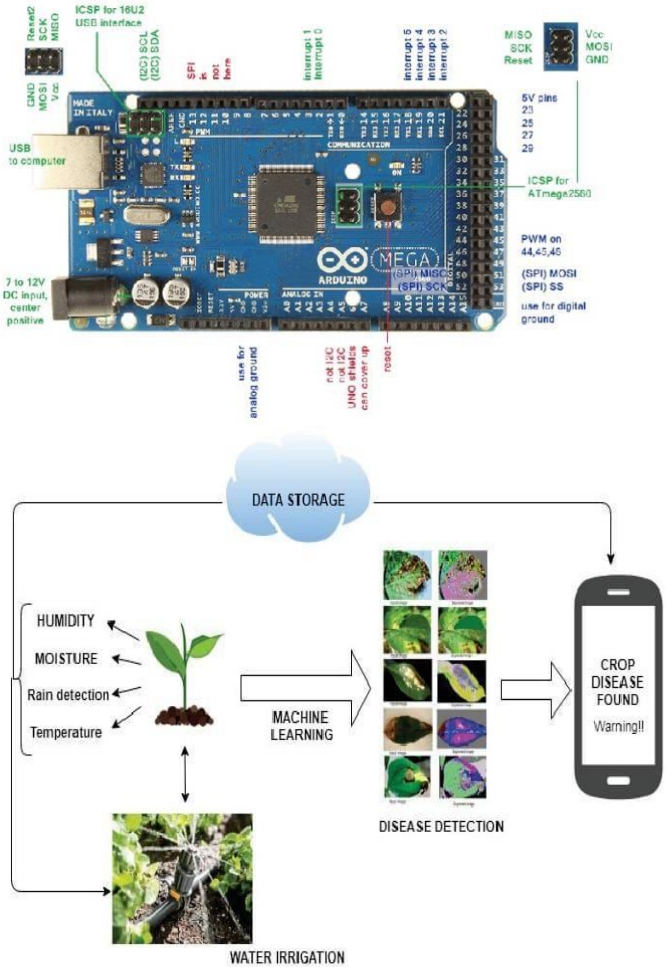
Start
Run the program using Arduino mega 2560 and esp 8266.
Check if temperature is greater than 35 degree Celsius and smoke greater than 300
Fan = On
If rain is greater than 10
Screen = display
If light is less than 0
Turn on lights
Stop

Block Diagram Of Crop Health Monitoring Using Drone Technology



VII. OBJECTIVE

Our main objective is to monitor the environmental parameter such as humidity, temperature, rain, to get good quality of silk by using proper sensors. To improve the quality of the silk farm output with very less human interventions. To provide an effective technological solution to the field of sericulture at the same time being cost effective and easy maintenance. To make this project as multipurpose by making a small changes in assembling and coding. To make this project as multipurpose by making a small changes in Process Of Crop Health Monitoring



Arduino board is an open-source microcontroller board which is based on Atmega 2560 microcontroller. The growth environment of this board executes the processing or wiring language. These boards have recharged the automation industry with their simple to utilize platform wherever everybody with small otherwise no technical backdrop can start by discovering some necessary skills to program as well as run the Arduino board.

ADVANTAGES

It recommends financially affordable and power effective organization. Efficient automated technology to Monitor and control the temperature, humidity and light intensity present in silkworm rearing house.

The proposed system reduces the man power and reduces It reduces chance of error The model is easy to implement and use. Monitoring climate conditions.

LIMITATIONS

The sericulture based equipment requires farmers to understand and learn the use of technology. If the internet facility is slow the result will be slow.

APPLICATIONS

Ideal programme for the worker section of the society. High employment potential. Provides vibrancy to rural economy. Low gestation, high returns. Eco-friendly. Women –friendly occupation. Facilities for sericultrists.

VIII. CONCLUSION

The system can be used to improve the quality of silk farm output with very less human interventions. In addition to quality and controlling and monitoring the system can be programmed to have extended functions in the silk farm as required by the farmer. As the system built on open-source resources, it provides a basic framework for any future agricultural-related innovation in the field of internet of things and embedded. The sericulture will enable the end user to monitor and to actuate the sericulture system in real time by making use of an internet. Prototype will operates in real time for monitoring and actuation inside the system and preliminary test proves that implemented prototype is successfully capable to monitor the parameters in real time and to control the inside the deployed environment and has several advantages in term of monitoring.

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