



## AN APPROACH TOWARDS FARMBEATS: IOT BASED DATA-DRIVEN AGRICULTURE SYSTEM

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**Abstract:** Data-driven techniques help boost agricultural productivity by increasing yields, reducing losses and cutting down input costs. However, these techniques have seen sparse adoption owing to high costs of manual data collection and limited connectivity solutions. In this paper, I present Farm Beats, an end-to-end IoT platform for agriculture that enables seamless data collection from various sensors. The main motive of the paper is to improve the process of organization of agriculture fraternity in India, eventually leading to eradicate the suicides of farmers and stabilize the prices of agriculture produce in India. This paper deals with data driven techniques to achieve the objective.

**Keywords:** Drip irrigation, humidity sensor, Arduino, LCD, rain probability.

### INTRODUCTION

The demand for food is expected to double by 2050, primarily fueled by an increase in population and upward social mobility. According to International Food Policy Research Institute, data-driven techniques can help us achieve this goal by increasing farm productivity by as much as 67% by 2050 and cutting down agricultural losses. In fact, field trials have shown that techniques that use sensor measurements to vary water input across the farm at a fine granularity (precision irrigation). It can increase farm productivity by as much as 45% while reducing the water intake by 35%. Similar techniques to vary other farm inputs like seeds, soil nutrients, etc. In this I have taken the certain parameters like soil moisture, climate. Condition, humidity levels, and co<sub>2</sub>, o<sub>2</sub> levels to build the purpose of the automation based on data driven agriculture.

In India for about 65% of population is employed in agriculture most of the Farmer have small holdings since, many years it is observed that agriculture sector in India is inorganization the unstable prizes of agriculture produce, involvement of middle men between consumers and formers, lake of knowledge and prior information, all the above and many more had led to increase in suicides of formers as there end up in losses and moreover unable to repay the loans.

In India most of the agriculture pulls behind the poverty line however, many experts believe the conditions of agriculture shall improvise only by implementing modern agriculture techniques. This paper shall emphasis more on usage of modern agriculture techniques in key areas. This paper also discusses on efficiency an affordability to produce the crop by data driven technique in this paper, we have taken certain parameters like soil moistures content, climate condition, humidity levels and Co<sub>2</sub>, O<sub>2</sub> levels to propose the automation based on the data driven agriculture. In this model we are using multiple sensors

integrating with Arduino to perform coordinated job to display info graphics and recommendation along with performance of automate dripirrigation.

### LITERATURE SURVEY

- ❖ Ajitmar, DIGITAL AND DATA DRIVEN AGRICULTURE, Analyzed the secondary data statics Tracing of types of data and useful information in the agriculture An author has mention about streams of data challenges of data and challenges for small holders farmers An author has discuss about solutions the challenges.
- ❖ Ravi Kishore Kodali, Vishal Jain and SumitKaragwal, SMART GREENHOUSE USING IOT AND CLOUD COMPUTING, This work provides a model of a smart green house, which helps the farmers to carry out the work in a farm automatically without the use of much hand- operated inspection. Greenhouse is the best solution for all this, but for this farmer need continuous tracing of a greenhouse to maintain all environmental conditions that needed for different crops. High quality crop production. Need to each type of sensorcalibrations.
- ❖ Anubhav Gulati & Sanjeev Thakur, SMART IRRIGATION USING INTERNET OF THINGS, This paper proposes an automated system for irrigating the fields. ESP- 8266 WIFI module chip is used to connect the system to the internet. Various type of IOT is used to inform the farmers of the supply of water to the soil through an android application. Every time water is given to the soil, the farmer will get to know about that irrigation. Android application with cloud storage Challenges such as

power cut have not taken into consideration and feasibility to different crops have not been discussed.

- ❖ D. Sowmya, R. Praveen Sam & K. Govardhan Reddy, SMART WATER DRIPPING SYSTEM FOR AGRICULTURE/ FARMING This method works utilizing putting in sensors within the subject to monitor the soil temperature, moisture and kind of soil, which transmits the data to the microcontroller for estimation of the correct amount of water as according to the requirements. The estimated quantity of rain is predicted using weather forecasting using Web scraper, and the plants are watered for this reason, i.e., is a heavy rainfall is predicted then the device will routinely reduce the water supplied to the plants Saves reliability system Water, time Easy to control Due to high initial implement cost This plastic components in a hot arid climate when exposed to ultraviolet light.
- ❖ Kiranmai Pernapati, IOT BASED LOW COST SMART IRRIGATION SYSTEM The design for continuously monitoring the weather conditions, water level in reservoir, soil moisture and then supplying water depends on the requirement. The Soil Moisture Sensor sense the soil moisture of a plant, if water content is below minimum requirement then water will supply from water reservoir using relay and Ultrasonic sensor measures the water level of

reservoir after that sends the data to ESP8266 NodeMCU All kind of requirements and supply is to be don through SMS only, which Is easily available This sensor iCloud conditions solar energy will not be enough to operate this solar powered pump module.

### PROBLEM STATEMENT

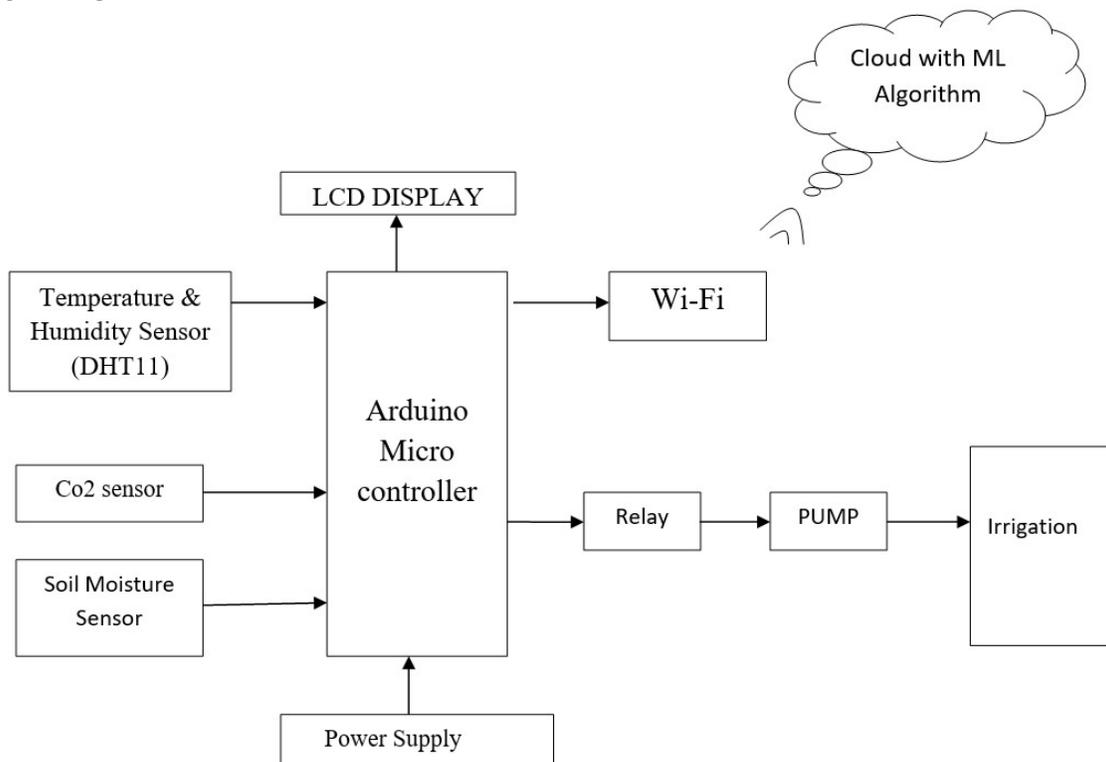
I observe the agriculture sector in India as unorganized; I make this bold statement as I come from the family of farmer. When I look at the ground reality i.e. suicides of farmers due to loses, and extremely fluctuating prices of produce. I have taken up this research paper to improvise the agriculture sector in India to contribute to Indian economy.

### PROPOSED SYSTEM

In this I have deployed the system in two farms and the farmers are already using it for three applications: precision agriculture, animal monitoring, and storage monitoring.

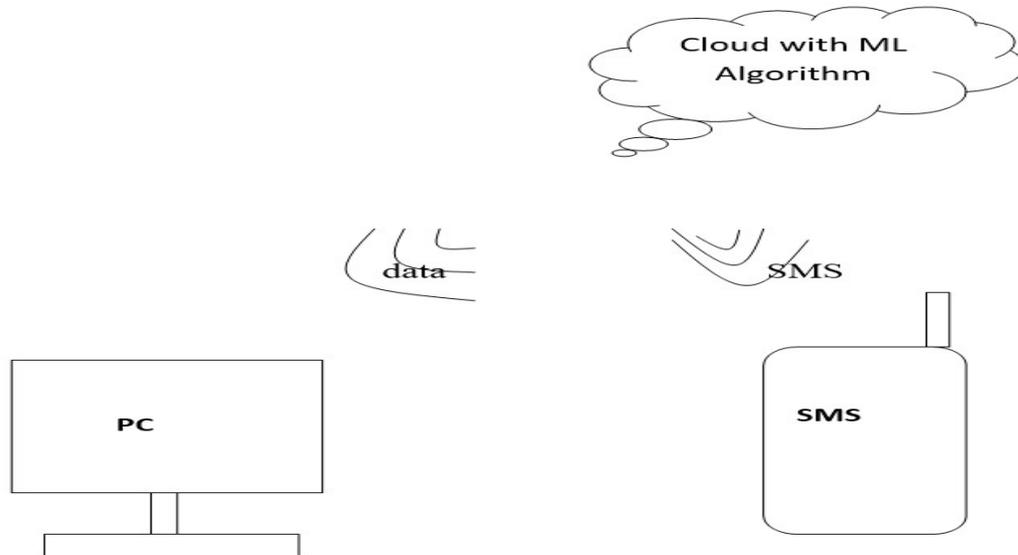
Moving forward, I am working with the farmers to develop several other applications on top of Farm Beats. And I'm going to propose the humidity levels, co<sub>2</sub>,o<sub>2</sub> levels and mainly focusing on drip irrigation and water levels.

### I. BLOCK DIAGRAM



**Fig (1) using micro controller drip irrigation overview**

**MONITORING UNIT**



**Fig (2) using ML algorithm monitoring the data**

**II. CONCLUTION AND FEATURE WORK**

There is a lot of scope for improvising this model in many areas as of now this model is only limited to certain detection of parameters as well as drip irrigation. In upcoming stages, usage of insect detection sensors and insecticides can be included along with variations other health recommendation. Other major category which needs to be implemented in the later stages whether after the model being popular with lot of users the pricing strategies for the drip irrigation.

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