

”Effective Water Management System”

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Abstract: Nowadays the number of cases in the context of farmers committing suicide is increasing day by day. The reason for the same will surely vary from the family to the family of the farmers. Some causes include scarcity of water/ improper water supply, lack of knowledge of the fertility of the soil and the soil content, no prior analysis of past failure, and lack of direct communication between farmers and authorized personals to maintain the demand and supply ratio. All these factors lead to inflation where the cost of the product/pulses reduced due to high supply but lack of demand. As a result, the expected price recovery of the farmer was not satisfied this leads to heavy debts and manipulates the mind of farmers to commit suicide.

Keywords: Farmer Suicide, Water Theft, Soil Moisture, Crop Prediction, Demand And Supply, Water Management System.

I. INTRODUCTION

Various reasons have been offered to explain why farmers commit suicide in India, including Anti Farmer laws in India, floods, drought, debt, use of genetically modified seeds, public health, use of lower quantity pesticides due to fewer investments producing a decreased yield. The proposed system “Water Management System” will not only prove to be a relief for the farmers for efficient water supply but also helping the farmers to test the soil by themselves and will provide direct communication amongst farmers and the authorized person to maintain the demand and supply ratio effectively. It helps in the understanding of plant water used, quantifying crop transpiration and soil evaporation, and allows us to devise strategies to improve crop production, reduce unproductive water losses and prevent land and water degradation. “Soil Testing Tube” commonly refers to the analysis of a soil sample to determine nutrient content, composition, and other characteristics such as acidity or pH level. A soil test can determine fertility or the expected growth potential of the soil which indicates nutrient deficiencies, potential toxicities from excessive fertility, and inhibitions from the presence of non-essential trace minerals. Due to a lack of communication between government officials and farmers, the suicide rate of farmers increases rapidly. The proposed system will help us to reduce this figure as recorded- the farmer’s suicide rate in India had ranged between 1.4 and 1.8 per 100,000 total populations, over a 10-year period through 2005, however, the figures in 2017 and 2018 showed an average of more than 10 suicides daily- effectively.

II. LITERATURE REVIEW

II.1 EXISTING SYSTEM

The current system that is used in India is the physical conferences and meetings are held at regular intervals which leads to a lot of confusion. For soil testing, the collected soil sample is forwarded to the lab where the parameters are checked and a report is generated to the agriculturist after a couple of days and even weeks.

II.2 RESEARCH WORK

Multiple research and analysis were done for maintaining an efficient supply of water, effective and low-cost testing equipment. But if the water supplied from the government is 10 litre but the water supplied to the farmer is 8 litre, the farmer is supposed to pay for 2-liter water loss too. Another important point that is important for farming is the selection of crops. The crop is selected based on environment, region, soil fertility/acidity, and other parameters too. Communication plays a vital role in the productive result. Lack of direct communication is leading to either excessive production of goods or shortage of goods which is not a good sign in either case.

II.3 DISADVANTAGES OF EXISTING SYSTEM

- The field will get waterlogged and the crop cannot get sufficient water and air, as good aeration and warmth in the root zone are essential for proper plant growth.
- Bacteria that change organic matter into plant foods cannot get the necessary air and warm temperature in the soil.
- Desirable chemical reactions cannot take place and nutrient availability is not easy for the plants.
- Proper root development and absorption of nutrients are not accelerated.
- Plants affected by diseases and pest attack.

III PROPOSED SYSTEM

Problem Statement: The number of cases increases in the figures of farmers committing suicide is increasing in India, either due to natural reasons or due to heavy debts. Here, we will be dealing with three factors, viz.: a. Water Theft b. Crop Prediction and c. Demand and Supply.

Solution: The proposed system “Effective Water Management System” will not only prove to be a relief for the farmers for efficient water supply but also helping the farmers to test the soil by themselves and will provide direct communication amongst farmers and the authorized person to maintain the demand and supply ratio effectively

MODULE1: WATER THEFT/ LOSS DETECTION

The incidents of water theft from the canal had taken place and farmers can't take any strict actions towards them. To overcome this, we are using “Water Flow Sensors” in our system in module 1. In this, we are going to use water flow sensor. Through this, we can easily determine the stealing of water and pay the accurate amount of water. When a farmer starts to cultivate a new crop, they are unaware of which type of crop to cultivate depending upon the soil type. This issue will be resolved by helping the farmers to test their soil with the ease of their farm. This kit will be helping the farmers to know the humidity, temperature, and moisture of the soil and the environment. These parameters will help the farmers to choose the best crop to cultivate resulting to yield maximum profit and ultimately leading to the prevention of financial loss. The analysis of the soil will take place with the help of ‘Sensor-fusion algorithms’. The kit will be consisting of multiple sensors. The overall output will result in the reduction of farmers in debt.

MODULE2: SOIL TESTING AND DEMAND AND SUPPLY

We see in our daily day-to-day life that the price of vegetables varies very often. This is either because of ‘Hoarding’ or lack of communication on the concept ‘Demand and Supply’. Here the problem is with the system that administers the complete process; as a lack of communication where farmers are not sure with the crop/ vegetable to produce. Maximum times it is noticed that the farmer cultivates the same crop as that of their neighbour farmers and this leads to a problem. The second module will help the administrator to precisely distribute the type of crop to cultivate to the farmers. And it will be easy for the farmers to cultivate the crop. This method will help the farmers to sustain their predefined profit ratio and yield maximum profit. Now the farmers will be sure of the type of crop cultivation. This process will be based on the web application where the administrator will be governing the process and give the type of crop to cultivate. Surely these modules altogether will help us to decent the graph -farmers’ suicide in India- and accent the morals of the farmers.

III.III A. CIRCUIT DIAGRAM

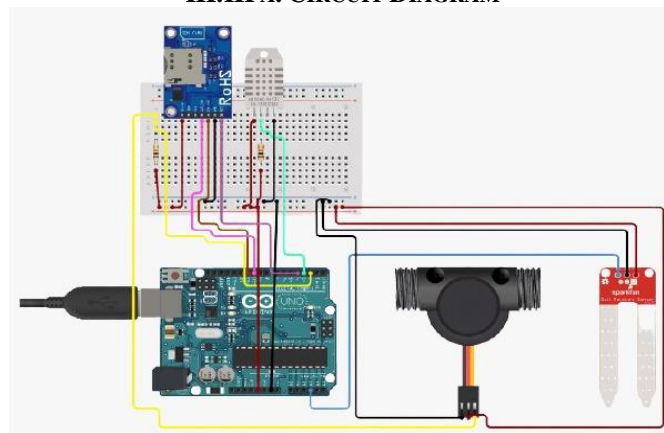


Figure 1.1(a): Circuit Diagram



IV.IV WORKING

In our kit we are going to use water flow sensor. Through this, we can easily determine the stealing/loss of water and pay the accurate amount of water. When a farmer starts to cultivate a new crop, they are unaware of which type of crop to cultivate depending upon the soil type. This issue will be resolved by helping the farmers to test their soil with the ease of their home. This kit will be helping the farmers to know the humidity, temperature, and moisture of the soil. These parameters will help the farmers to choose the best crop to cultivate resulting to yield maximum profit and ultimately leading to the prevention of financial loss. The analysis of the soil will take place with the help of ‘Sensor-fusion algorithms’. The kit will be consisting of multiple sensors. The overall output will result in the reduction of farmers in debt.

It also allows the administrator to precisely distribute the type of crop to cultivate to the farmers. And it will be easy for the farmers to cultivate the crop. This method will help the farmers to sustain their predefined profit ratio and yield maximum profit. Now the farmers will be sure of the type of crop cultivation. This process will be based on the web application where the administrator will be governing the process and give the type of crop to cultivate. And on the same application the farmer will also receive all the values send by the particular sensor with the help of GSM module.

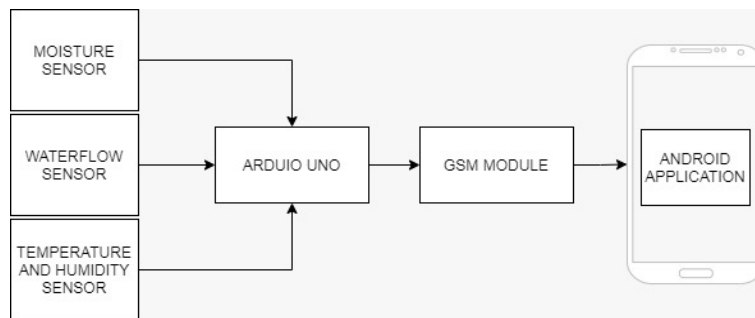


Figure 1.1(b): Block Diagram

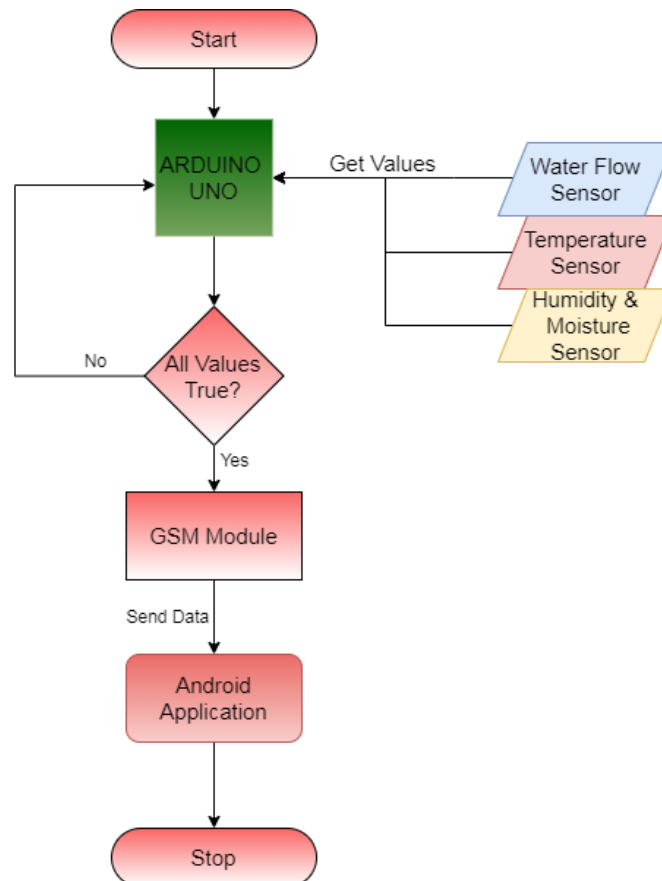


Figure 1.1(c): Flow chart

V ADVANTAGES OF PROPOSED SYSTEM

- Efficiency: It helps in managing irrigation systems more effectively and efficiently. It helps farmers to save water, increase yields, and to increase the quality of the crop.
- PH level: It determines the soil's nutrient level and pH content. Knowing the deficiency that your soil is experiencing will result in zero wastage of farm inputs.
- Direct contact: To sustain the supply of fresh organic produce and to increase access to fresh organic produce to even more consumers, farmers must cultivate relationships with their higher authorities.
- Anti-theft: No stealing of water.
- Time saving: Soil testing can be done in a lesser time.

VI DISADVANTAGES OF PROPOSED SYSTEM

It is very necessary to protect the kit from moisture as it is electrical. So no close contact of water must exist on the hardware provided.

VII HARDWARE REQUIREMENTS

- 1) Arduino UNO
- 2) GSM Module
- 3) Sensors
- 3a) Water flow Sensor
- 3b) Soil moisture Sensor
- 3c) Temperature and Humidity Sensor
- 4) Jumper Wires
- 5.12 volt DC adapter

VIII SOFTWARE REQUIREMENTS

- 1) Android studio
- 2) Arduino IDE.

IX SCOPE OF THE PROJECT

Taking a tour to the future scope; the product is all set for future upgradations to come into picture. Wherein the government will be able to give multiple demands to the farmers and so the efficient supply will be reverted to the government. Hence this will result into the smooth trading between the farmers and the government body (ies).

X CONCLUSION

Water Management System- is ready and as discussed earlier the water flow sensor is stating the quantity of water consumed and hence loss/ theft of water is detected within a short span of time. The concept of demand and supply are into picture which is providing a helping hand to the government to reduce the graph of farmers committing suicide. This is achieved with the help of awaking the farmers the exact quantity to be produced. Using the sensors the parameters- soil moisture, temperature and humidity – the best crop to be cultivated is predicted efficiently. The functioning of the sensor is executed using Arduino IDE where blocks of code are written and burnt into the Arduino UNO. And interactive user friendly User interface is provided.

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