

Smart Irrigation Using Sensor Based System

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Abstract: The paper entitled “Smart Irrigation using Sensor based System” is developed using Arduino IDE 1.8.7. The main aim of this paper is to monitor the irrigation in agriculture in an efficient manner. Agriculture plays a vital role for the development of a country. Issues concerning agriculture are always hindering the growth of the country. The only solution to this issue is Smart Irrigation for agriculture by updating the current traditional methods of agriculture. Agriculture is the main occupation in our nation. Some people have migrated from rural to urban due to various hurdles in agriculture and to overcome this problem different smart IoT techniques have been used. The work flow of the system is to control the wastage of water in agricultural land. The developed process is used to supply water from storage areas like well etc. When the land is dry is automatically get the water from well. When the well is full, it automatically supplies the water through GPS attached pipe to the field. It also identifies the damaged position of the pipe. Sensor Based technology reduces the cost and enhance the productivity of traditional farming.

Keywords: Iot, Sensor, Water Flow.

I. Introduction

Water is one of the main sources of energy available for living things on earth. Agriculture folks are not aware of their water consumption and thus water management is complicated for them. To overcome these issues the paper titled “**Smart Irrigation Using Sensor Based System**” has been introduced. It gives the solution for measuring important water parameters like water level and water consumption. The process computes all the parameters in real time and can be remotely viewed/controlled over smart phones using Internet of Things (IOT). The system measures water level and rectifies the wastage of water by using GPS module attached to the pipe and senses the location where the pipe is damaged. It then measures the moisture of the land, detects the insects, animals and the temperature of the land to enrich the growth and the production.

II. Literature Review

Research is growing in all domains. In the current scenario agriculture and water plays a vital role in earth. Many researchers have focused to provide an optimized solution for water management and smart irrigation. A model proposed by [1] **VaishnaviJeurkar** in “IoT based Water Management System” used the Level sensor to indicate the level of water and they used capacitance. The performance of capacitance is measured using RC Methods to provide the output. Another model proposed by [2] **Kajol R & AkshayKashyap** in “Automated Agriculture Field Analysis and Monitoring System Using IOT” suggested the farmers about the moisture content, detecting pests and type of crop suited for soil.

III. Proposed Work

This paper mainly focuses on the water consumption and eradication of pests from the agricultural land. Most of the farmers do not have awareness of the modern world and they focus on the traditional norms. The development in science and technology had initiated a lot throughout the globe. To overcome the old traditions and the methodology from the literature survey, there is a need for the farmers to be uplifted in the society. The contribution of this study is water consumption a necessary technique and identifying the fertility of the soil for growing the apt crops in the land for the farmer’s welfare. Water is the main source for the agriculture. It must to be consumed. Based on the moisture content in the soil, the water level is automatically regulated and supplied to the land. During water flow if any damage occurs in the pipe, the water will not be supplied to the land. GPS module is inserted to intimate the location of damaged pipe thereby consuming lot of water.

IV. Methodology

❖ Data Collection

The existing collected data provides the information about agricultural factors which in turn helps to monitor the system. Monitoring the agricultural land is not easy as possible. The monitoring system is to give the solution to water consumption. There are many elements that affect the yield. The factors are :

- Less water leads poor productivity.

- More water leads root death.
- The attack of insects, birds, animals, human beings which can be controlled by some sensors.

❖ Automatic Irrigation

Most of the farmers do not have awareness of the modern world and they focus on the traditional norms. The development in science and technology had initiated a lot throughout the globe. To overcome the old traditions and the methodology from the literature survey, there is a need for the farmers to be uplifted in the society. The contribution of this study is water consumption a necessary technique and identifying the fertility of the soil for growing the apt crops in the land for the farmer's welfare. Water is the birthplace for the agriculture. It must be consumed properly. Based on the moisture content in the soil, the water level is automatically regulated and supplied to the land. During water flow if any damage occurs in the pipe, the water will not be supplied to the land.

❖ GPS Module

In this subsystem the GPS Module is inserted in between the pipe. It tracks the location every time. It sends the notification when the pipes get damaged. It consists of Node MCU, water flow sensor and GPS Module.

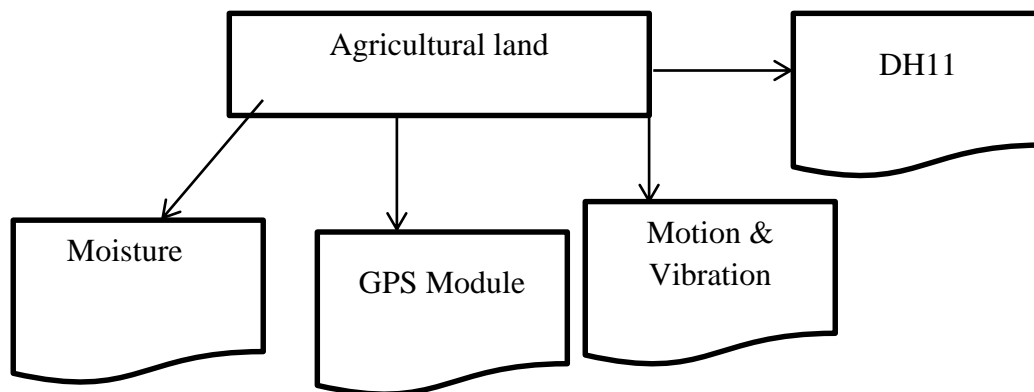


Fig .1 Arrangement of the sensors

❖ Sensor Nodes

This module mainly focuses two sensors. These sensors are placed in the soil which communicates with Arduino Boards by the use of effective communication. These system was developed using microcontroller. They are listed below:

- Motion and Vibration Sensor
- DH11 Sensor

The Motion and Vibration sensor are used to detect the animals, Insects and alerts the farmers through buzzer. The DH11 sensor is used to detect the temperature and humidity of the land.

❖ IOT Module

This system is proposed for water consumption. It provides temperature, humidity, Motion & Vibration, Moisture Sensor used to detect the moisture content in the soil. GPS Module tracks the location in the field. The Water Flow Sensor is used to identify the water flow rate. These sensors are monitored on Smart Phone. It provides the automatic water provision mechanism.

V. Process Flow

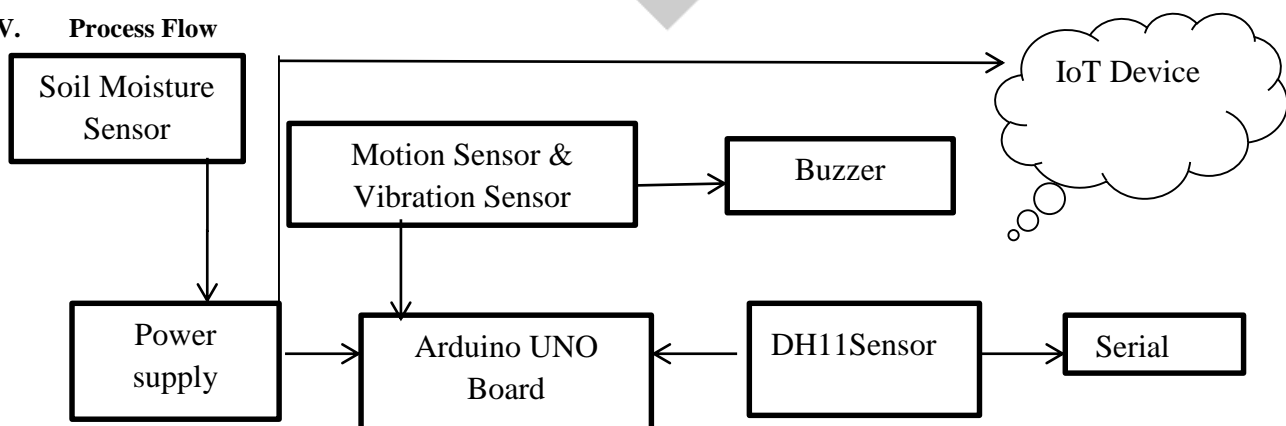


Fig. 2 The Work Flow is to detect the moisture content

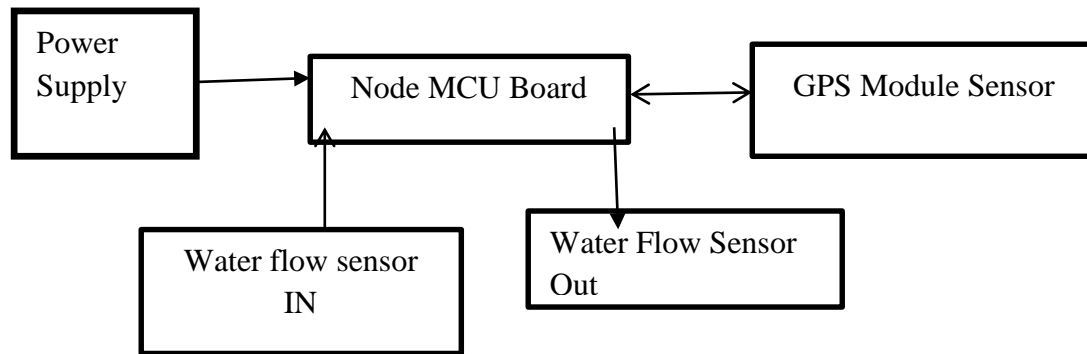


Fig.3 It detect the damaged pipe and intemate through GPS

VI. Work Flow

It represent the moisture level in the soil in both dry and wet condition

Input Data (in moisture)	Output Data (in real time)
1018	Dry State
269	Wet State

It represent the humidity and temperature of the soil

Humidity and temperature (in dry state)	Humidity and temperature (in wet state)
95% and 32°C	92% and 33°C

VII. Conclusion

The implementation of this system ensures the unwanted wastage of water in the field of agriculture. It provides the pests free land and find the quality of the soil to promote the suitable crops to be grown. It provides an efficient and smarter way of monitoring the fields for farmers. It reduces the effort of wastage of water. It helps to increase the productivity of fields. Farmers can monitor their agricultural field at anytime and anywhere in the world. In future the agricultural land would be a great boon for the farmers.

References:

- [1]Kaushik Gupta (2018), "Smart Water Management in Housing Societies using IoT", Inventive Communication and Computational Technologies (ICICCT) .
- [2]Maneesha V. Ramesh; K. V. Nibi; AnupamaKurup; Renjith Mohan; A. Aiswarya; A. Arsha; P. R. Sarang, (2017) "Water quality monitoring and waste management using IoT".
- [3]S. Ullas, H. N. Vishwas,(2019) "Flow Management and Quality Monitoring of Water using Internet of Things", Smart Systems and Inventive Technology (ICSSIT)
- [4]Nallapaneni Manoj Kumar, Archana Dash, Neeraj Kumar Singh, "Internet of Things (IoT): An Opportunity for Energy-Food-Water Nexus", (2018), Power Energy Environment and Intelligent Control (PEEIC)
- [5]VarshaRadhakrishnan, Wenyan Wu,(2018), "IoT Technology for Smart Water System", HighPerformance Computing and Communications; IEEE 16th International Conference on Smart City; IEEE 4th International Conference on Data Science and Systems (HPCC/SmartCity/DSS)