R.V. COLLEGE OF ENGINEERING

(Autonomous institution, affiliated to VTU, Belgaum)



**DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION**

**Mini Project Synopsis**

Design & Development of IoT based Farming Solution

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**AIM**

To design, test and develop an IoT based automatic farming system.

**OBJECTIVE**

The objective is to develop a low cost portable device which can monitor the crops grown in farm. Different parameters (Humidity, Temperature, pH, Nitrogen level) acquired logged and monitored using Ethernet or Wi-Fi to cloud or an Android App and drive the corresponding outputs. The result will be displayed on LCD display. Hence the commercially available sensors and actuators are used and integrated with Atmega328 Controller.

**RESEARCH GAP**

The existing system of conventional farming involves intervention of man power which can lead to inefficiencies. Hence in order to overcome some of the defects, the concept of smart farming is used. The already existing automated farming solutions are not cost effective and cannot be implemented practically on the field with respect to Indian scenario.

Hence the proposed method minimizes manpower and material resources. A real time monitoring would provide continuous data so that daily, seasonal, and event-driven fluctuations are not missed. Therefore, there is a need for real-time, on-site, farm monitoring systems which can acquire and deliver continuous data of high quality at an acceptable cost.

**INTRODUCTION**

The word agriculture is a late Middle English adaptation of Latin *agricultūra*. Agriculture is the cultivation of animals, plants and fungi for food, fibre, biofuel, medicinal plants and other products used to sustain and enhance human life. Agriculture was the key development in the rise of sedentary human civilization, whereby farming of domesticated species created food surpluses that nurtured the development of civilization. The study of agriculture is known as agricultural science. The history of agriculture dates back thousands of years, and its development has been driven and defined by greatly different climates, cultures, and technologies. The major agricultural products can be broadly grouped into foods, fibres, fuels, and raw materials.

The history of agriculture in India dates back to Indus Valley Civilization Era and even before that in some parts of Southern India. Today, India ranks second worldwide in farm output. Over 58 per cent of the rural households depend on agriculture as their principal means of livelihood. Agriculture, along with fisheries and forestry, is one of the largest contributors to the Gross Domestic Product (GDP). In the years since its independence, India has made immense progress towards food security. Indian population has tripled, and food-grain production more than quadrupled. There has been a substantial increase in available food-grain per capita.

**MOTIVATION**

“Slow agricultural growth is a concern for policymakers as some two-thirds of India’s people depend on rural employment for a living.”

Any motivation usually results due to some problems or drawbacks. Similarly, our motivation comes from the drawbacks of regular farming techniques used. Some problems include –

* Current agricultural practices are neither economically nor environmentally sustainable and India's yields for many agricultural commodities are low.
* Irrigation systems are inadequate, leading to crop failures in some parts of the country because of lack of water.
* Although India has attained self-sufficiency in food staples, the productivity of its farms is below average.
* The average size of land holdings is very small and is subject to fragmentation due to land ceiling acts and family disputes.
* The irrigation infrastructure and yield is deteriorating. The overuse of water is being covered by over-pumping groundwater each year.
* Irrigation facilities are inadequate, as revealed by the fact that only 52.6% of the land was irrigated which result in farmers still being dependent on rainfall.

**METHODOLOGY**

Sensors

(Humidity , Temp, Nitrogen content, etc)

Processing and Computation

Atmega328

Data Logging to a cloud storage.

(Web browser and Android App)

Driving and Controlling .

(Using Ethernet or Wi-Fi module)

Actuators and Display

(Motors, Pump and LCD)

Power Supply

Fig.1: Block Diagram of IoT based farming system

**OUTCOME AND EXPECTED RESULTS**

The proposed methodology of smart farming is designed keeping in mind the features of automation and also the cost effectiveness. So the system so implemented will have the following outcomes:

* Water usage efficiency- Saves wastage of water by constant monitoring.
* Saves time and money over the long run- There will be very less human intervention in the process and hence saves time. Also this is a one- time investment.
* Better growth rate of plants since the nutrient intake is monitored.

With the implementation of IoT, we have the database, i.e, we have the details of the climatic condition over a period of time and the corresponding working of the system. This is in a way data analytics which can be further taken into the field of machine learning and artificial intelligence.

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