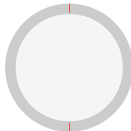



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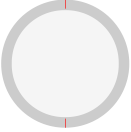
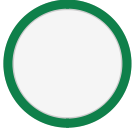
### ABSTRACT

Smart agriculture method using IOT Technology, enhances the yield and reduces the human intervention towards agriculture works. The prime factors are high accuracy and low power for any IOT based ranchers. In this project we have designed a controlling mechanism for the flow of water into agricultural farms depend on the wetness of the soil and the crops. The humidity and temperature sensed by the sensor mainly depends on the action performed by the farmer. These long range data transmission of the sensed data is effectively possible by adopting LoRa. These long range network can transmit data upto 15 km; usage of this communication module ensures the remote site data transfer operation. The sensed environmental parameters are communicated to farmers via smart mobile using LoRa technology. Smart irrigation system can utilize water efficiently, in the precision place at the appropriate time in the right amount.

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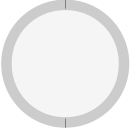
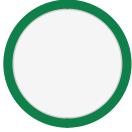
### 2.INTRODUCTION

This project proposes a smart irrigation system based on ESP32 TTGO LoRa. The structure detects different environmental features like temperature, moisture, and the quantity of water needed by the crops, employing sensors i.e temperature, soil moisture, and water drift. The detail is collected and stated to the ESP 32 TTGO setted in the farm which is attached to another ESP32 TTGO deposited within the span of 5KM through LoRa protocol. This section is attached to IBM cloud through the internet using the WiFi stack existing on ESP32 which denoted the continuous qualities. This enables the farmer or IBM Blue mix to control irrigation pumps and sprinklers from distant places and to meet the standard qualities which would assist the farmer with yielding better quantity and quality of the crop. Agriculture is a grassland where water is essential in more quantity. Destruction of water is a real affair in agriculture. In course of the growing further amount of water is given to the grassland. There are innumerable techniques to the alternative or to command wastage of water in agriculture. In the society, the majority of irrigation structure works manually. These outmoded techniques are replaced with semiautomatic and automatic policy. The approachable customary procedures resemble drip irrigation, sprinkler system, ditch irrigation, terraced irrigation. The universal irrigation situation is sorted by enlarged interest for higher agricultural capablity, poor performance and decreased availability of water for agriculture. These affair can be corrected if we make use of smart irrigation structure. Through Internet of Things, agriculture outcomes will have a fresh growth state, better storage conservation, and best quality. With the advancement of Internet of things, its innovation has been broadly connected to all the aspects of agriculture.

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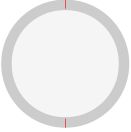
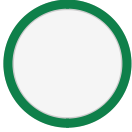
### MAIN OBJECTIVE:

Connecting configuration is clearly an esteemed task being required for ensuring society's welfare. Water distribution systems are inherently vulnerable as they comprise of numerous exposed elements which can be subjected to deliberate or unintentional contamination. This project offers the smart maintenance at this digital year regarding the water distribution. Using LoRa we can control and monitoring in various field using one controller of master. We are all came to know that Indian economy is one of the huge growing economies of the World. The agricultural section has its great allowance in the Indian economy. To attain most fulfillment of work force and to obtain maximum profit in a given specified there is a need in the up sequence of several engineering methods that are being used today. Thus sustaining proper quantity of water level in the soil is one of the essential necessity to harvest a good crop that can be a origin of several types of alimentary whether micro or macro for their actual germination.

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### 4. PROPOSED METHODOLOGY

Water Reservoir in India is now displayed as group based command manage system, under which it is required to magnify volume of provincial community occupying in villages and small towns to evolve and survive their own water supply systems.

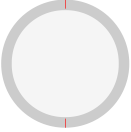
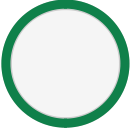
The upgrade problem is actually a kind of huge scale combinatorial enhancement problem. Currently, many literatures settled to the problem of the set wrapping problem or maximal coverage. The old mainly examine the least number of sensors, while the latter is a crucial research on the ideal sensor grouping.

We can monitor the water flow parameters on the internet. The water distribution monitoring are done through separate web server.

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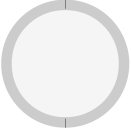
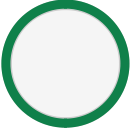
### 3.1 EXISTING METHODOLOGY

Smart watering system can enhance the water intensity installed on the soil moisture and weather state and decides whether the plant has to be sprinkled or not irrigation administration of the plants is by watching and designing on Real time distinct values. Increase production quit can be acquired depending on the temperature and humidity of the surroundings. Temperature state can be managed by making work of cooling fan. Nutrient planning of the soil can be uniformed site on the Electrical Conductivity using LDR sensor. All inclusive values of the sensor data's can be observed in the mobile app and conclusions can be build by the user correspondingly. A noteworthy amount of money is rescued and hence the irrigation system develop the assets so that entirety gets what it needs without unwanted waste

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### WORKING MODULE

#### 4.1 TRANSMITTER MODULE

From the given components in the Block Diagram Fig 3.1 of Transmitter Module, the values from the sensors is measured and transmitted through the LoRa to the Receiver Module, The Receiver Module send back the message to the transmitter part which triggers the relay for the flow of water into the agriculture field with the help of DC water pump and This type of operations are done only when the field is dry or require some quantity of water to it. Water doesn't flow without any instructions from the receiver part, and also during the time of excess amount of water in the field. From the below Diagram there is a sample of mud inside the box and the soil moisture sensor is placed on it for measuring the moisture and the DC water pump is connected to it for filling the required level of water in it.

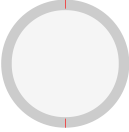

#### 4.2 RECEIVER MODULE

The receiver module is placed in the farmer house or somewhere the receiver wishes to be. The values from the transmitter is received and send backs the message to the transmitter whether it reaches the required level of moisture level in the field and also the values are displayed in the LCD display and the receiver is working through the think speak cloud which stores the commands in it, used to send the message to the relay.

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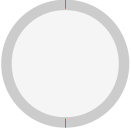
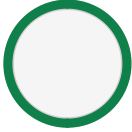
### 5. RESULT

After execution the modules in our proposed framework, the results have been taken. The results display humidity, Moisture levels are taken. From the eventual outcome of the examination, the system alert concerned farmers and came to know that whether the crops are in good level and also to reduce the usage of water level from a certain distance. The structure assists in providing a well yield of the crop that effects in more gain to the end user and an increase in the cultivation. The LoRa based communication has been produced considering the relieve of use, trouble free and cost. The device is completely automatic and things speak cloud makes it more secure.

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### CONCLUSION:

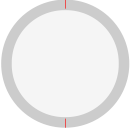
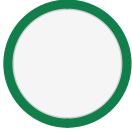
The communication technologies of IOT play a very major role in smart agriculture network. This project initiates a smart irrigation system build on LoRa technology. In order to authenticate the magnificent accomplishment of the offered irrigation system, demonstration have been executed. Experimental outcome confirmed the connectivity of the proposed system. Simultaneously, the advantages of LoRa technology assumed in smart irrigation system have been revealed by experiments. The system proposed by us to promote more well organized, also reduced the cost of distribution and conservation. In accordance with the practical results, the irrigation node provided with hydroelectric generator can utilize up to for decades. The communication interval between the irrigation node and gateway is up to 8KM, thus the irrigation system can surround up to 200 hectares. By mobile App, end users can manage the irrigation system subordinately and check the position of system in time. It is credited that appropriate LoRa technology to smart irrigation system will applicably simulate evolution of smart agriculture. Of course, we have plenty of research work to do to make the system more acute and error-free managing.

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### 5.2 FUTURE WORKS:

#### Field Deployment Module

The Sensors placed in the field can be measured in order to remove the privation and problems faced by the deployment team, as the current setup is required to be manipulated every time when it is established or restored. This Can prefer the pre setup cost to be remarkably down and enable easy configure of the structure by a non-technical person Systemization of water flow control and other systems using robotics or any other similar mechanisms. This System can be farther extemporize by adding automated systems for Weeding, Harvesting and affiliate it with the existing system.

#### Communication Module

This section allow communication between the area distribution section and the other section or configurations. With development of technology like 5G it can be used on the public web work to get more attached of the technology and also can be used to avoid the primary deployment cost that is associated with the LoRa WAN based system as it needs to have a proprietary gateway system in order to interface with a public network like Internet.

#### Data Logic Module

The Logical Decisions are made by this module. This can be farther buildup and upgraded by using AI (Artificial Intelligence) and Machine Learning Technologies to make human like conclusion with rapid and accuracy. This accuracy can be improved by farther enhancing the systems proficiency by instructing them with large quantity of illustrative data from several execution of the system.

#### Cloud Deployment Module

The Cloud Systems are nearly new to organized the applications that are being used in the accomplishment of this system. This will all be associated to a public cloud which distribute as a supervisor for the field tracking. The cost features similar to high in hosting a private cloud and to preserve it. The public cloud are feasible and cheap in price. The future range of this is to make powered of public cloud in numerous ways other than real time data monitoring.

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