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MONITORING & CONTROLLING OF FARM USING SMART TECHNOLOGY & WIRELESS SENSOR NETWORK

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Abstract: Agriculture is one of the main needs for human to survive. Agriculture has to face many problems like changing soil quality, water shortage, changing climate, etc. Due to the increasing in population demand for cereals and other crops for daily usage by the consumers is also increased so there is a need for smarter implementation of irrigation and also develop farming methods that reduce human efforts and alter the basic eco systems this is less harmful to other creatures too. India is one of highest farming dependent county and producing countries all over the world. At the same time, India is facing the challenge of farmers committing suicide because of crop failure and liability. Most of the land in India is used for agriculture purposes. Still there exists several places that uses primitive methods for irrigation, fertilization etc. This leads to the decline in the crop yield and eventually less income for the farmers. This paper discusses the design and development of an IoT based module that helps farmers to improvise their methods of farming and also make the best use of their land for a better income. The main goal of this IoT module is to sense agriculture parameter and advice farmers to properly grow and treat the crops. Also in this project we are going to implement a irrigation control i.e. motor control through android app. To avoid animal interference flasher are also going to implement in the field. This will reduce human efforts.

Index Terms – WIFI, Database, IoT, Bluetooth.

I. INTRODUCTION

Nowadays mobile phones are becoming commonly used in daily scenario and among the beneficiaries of this are farmers. Farmers are using mobile phones in achieving their farming business and daily life. At the same time, Wireless Sensor Networks (WSNs) are also displaying a result in developed part of our world. WSNs potential in sensing various ecological condition, their affordability and applicability motivated conducting of this master thesis.

Therefore, the objective of project is to investigate and identify how the use of mobile phones with the support of WSN enable farmers where in their farm various sensors will be installed so that depending upon the sensed value we can control the devices in the field. Advantage of this system will be it will provide monitoring and controlling of farm devices so that human effort will be reduce.

II. REVIEW OF LITERATURE

These literature reviews are experimental work carried out by researcher on how to sense value by different sensor, how to connect those sensors to controlling unit and how to display the same.

Nor Alina Khairi, Asral Bin Bahari Jambek, Liew Ji Hwa and Uda (2013) In this paper author implemented device which will monitor the surrounding environment in the farm like temperature, humidity and animal motion with the help of PIC24F16KA102 microcontroller as controlling unit and the reading displayed on JHD162A LCD display (1)

Geetanjali A. Choukidar, Prof. N.A. Dawande (2017) Poultry farm is small business with maximum output so to make environment which monitor the poultry farm is essential to check temperature, water level, smoke, gas and food dispensing through smart device like Raspberry Pi and to transmit it GPRS is used.(2)

Dweepayan Mishra ,Arzeena Khan, Rajeev Tiwari, Shuchi Upadhay (2018) Farming plays major role in the economy of India so it is important business. For crop to grow properly checking humidity in the soil has done after particular interval is important. So in this paper system is developed for the same problem and one threshold value is set for humidity if that value is less than threshold then motor is switched on and humidity is maintained with help of Arduino kit and Wi-Fi module. (3)

K. V. Sai Vineeth, B. Vamshi and V. K. Mittal (2017) Automation can reduce the manual work there are various technology to implement automation but, in this paper, author choose voice controller eHome automation. For sending the voice command RF

frequency is used these commands are secured by voice password. In the transmitter side they used Arduino and to decode that command at receiver side raspberry Pi is used. (4)

Jalpa Shah, Bhavik Modi, Rohit Singh (2014) In this paper author explains the disadvantage of using wired home automation system over wireless automation system using RF module this can increase the range up to 20-30m and the speed of DC motor can also be control of Dryer from distance. (5)

F. Viani, M. Bertolli, and A. Polo (2017) In this paper author discussed about the reduction in dosages of pesticide this can be monitored by and controller by wireless sensor and Fuzzy logics to implement intelligent system.(6)

Xiaofan Jiang, Jose Fernando Waimin, Hongjie Jiang, Charilaos Mousoulis, Nithin Raghunathan, Rahim Rahimi and Dimitrios Peroulis (2019) As part of third generation revolution in farming farmers has developed a system to control the Nitrate using Nitrate sensor with temperature and soil sensor these data are observed six month and data transferred through cloud. To reduce the cost LoRa network and ANT antenna is used. (7)

Matti Satish Kumar, T Ritesh Chandra, D Pradeep Kumar and Dr. M. Sabarimalai Manikandan (2016) In this paper author mentioned the need of measuring soil moisture for that they have designed a simple low cost module consist of LED's and resistor and as monitoring Arduino is used. In paper experiment done in two ways 1st is along area and 2nd is carried out our depth and result are shown on MATLAB. The overall working of sensor is based on resistance offered by soil.(8)

Sajal Saha, Rakibul Hasan Rajib, Sumaiya Kabir (2018) IoT is used for the monitoring of fish farm aquaculture where the mini computer like Raspberry Pi is with temperature sensor, mobile camera to ensure the temperature of farm and the water color. (9)

Rekha P., Maneesha V. Ramesh, Venkata Prasanna Rangan, Nibi K V (2017) In this paper a IoT based farm automation is developed where the sensor node placed in farm and the send value is transmitted using RF communication of WSN node that data is transmitted to central unit the same central unit is connected to controlling unit which control the irrigation system, dosages of fertilizer etc. The output is displayed on android app this app also whose whether forecasting for taking necessary precaution (10)

Priyanka Padalalu, Sonal Mahajan, Kartikee Dabir, Sushmita Mitkar & Deepali Javale (2017) This paper aims on irrigation system for farming here sensor with microcontroller is used to achieve the goal, also data is updated to database with help of PC and data can be accessed by android app. To suggest fertilizer to crops Navie Bayes algorithm on database is used it also give rainfall prediction. (11)

III. CONCLUSION

The following conclusions were acknowledged by researchers

- 1) Using wireless sensor network or wireless sensor node for the application of farm application like farm monitoring and controlling farm appliances improve monitoring from remote location.
- 2) In country like India farming is important and require more man power these man power can be reduce by implementing system which is based on IoT with sensors can reduce human efforts.
- 3) For achieving the automation various technologies are present like Zigbee, WiMAX, Bluetooth, Zwave & Wi-Fi are available but one more option is their to automate the system for voice controlling is RF frequency.
- 4) Measuring soil moisture can be easy if we use circuit which made up with resistor and led with resistor fundamental working as mentioned in [8]
- 5) Sensed data after sending over wireless network that data can be displayed on android app or website which can be accessed at any time i.e. real-time by making use of database.

IV. REFERENCES

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