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Literature Review on IOT Based Smart Security and Monitoring Devices for Agriculture

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Abstract:- A smart way of automating farming process can be called as Smart Agriculture. By implying an automated system it possible to eliminate threats to the crops by reducing the human intervention. The major emphasize will be on providing favorable atmosphere for plants. These agricultural automated systems will help in managing and maintain safe environment especially the agricultural areas. Environment real time monitoring is an important factor in smart farming. Graphical User Interface based software will be provided to control the hardware system and the system will be entirely isolated environment, equipped with sensors like temperature sensor, humidity sensor. The controllers will be managed by a master station which will communicate with the human interactive software. The system will provide smart interface to the farmers. This smart system can increase the level of production than the current scenario. This system will realize smart solution for agriculture and efficientlysolve the issues related to farmers. The environment will not be the barrier for production and growth of any plant and can overcome the problem of scarcity of farming production.

Keyword: *Sensor technology, Smart Agriculture*

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1. INTRODUCTION

Agriculture is considered as the basis of life for the human species as it is the main source of food grains and other raw materials. It plays vital role in the growth of country's economy. It also provides large ample employment opportunities to the people. Growth in agricultural sector is necessary for the development of economic condition of the country. Unfortunately, many farmers still use the traditional methods of farming which results in low yielding of crops and fruits. But wherever automation had been implemented and human beings had been replaced by automatic machineries, the yield has been improved. Issues concerning agriculture have been always hindering the development of the country. The only solution to this problem is smart agriculture by modernizing the current traditional methods of agriculture. The proposed a system which is useful in monitoring the field data as well as controlling the field operations which provides the flexibility. The paper aims at making agriculture smart using automation and IOT technologies.The highlighting features of this paper include Node MCU and Arduino.

2. LITERATURE SURVEY:

The Arduino and Node MCU study reviews the efficiency in smart agriculture.

Patil K. A et al. (2016) [6], proposes a wise agricultural model in integration with ICT. ICT have always mattered in Agriculture domain. Over period, weather patterns and soil conditions and epidemics of pests and diseases changed, received updated information allows the farmers to cope with and even benefit from these changes. It is really challenging task that needs to provide such knowledge because of highly localized nature of agriculture information specifically distinct conditions. The complete real-time and historical environment information helps to achieve efficient management and utilization of resources. The issue is that the technique can achieve convenient wireless connection within a short-distance.

Joaquín Gutiérrez et al. (2014) [3],The paper aims at optimizing water use for agricultural crops. An algorithm was developed with threshold values of temperature and soil moisture that was programmed into a microcontroller-based gateway to control water quantity. The system was powered by photovoltaic panels and had a duplex communication link based on a cellular-Internet interface that allowed for data inspection and irrigation scheduling to be programmed through a web page. The issue is that the investment in electric power supply would be expensive.

Shakthipriya N et al. (2014) [7], As mentioned it reviews the state of art wireless sensor technology in agriculture.Based on the value of soil moisture sensor the water sprinkler works during the period of water scarcity. Once the field is sprinkled with adequate water, the water sprinkler is switched off. Hereby water can be conserved. Also the value of soil pH sensor is sent to the the farmer via SMS using GSM modem.The issue is that it provides only precision values that is not accurate and is not cost efficient.

BezaNegashGetu et al. (2015) [1], It investigate the design and simulation of an electronic system for automatic controlling of water pumps that are used for agricultural fields or plant watering based on the level of soil moisture sensing. The speed of the

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motor is varied according to the level of the soil moisture content; the motor is OFF during maximum wet and is running with HIGH speed during dry soil conditions respectively. The duration of water pumping is controlled by a timer circuit. The system is tested using NI MULTISM simulation software.DIAC and TRIAC techniques are used.The issue is that it does not support several water levels and uses old techniques.

G.MeenaKumari et al. (2014) [4], The approach proposes technological development in Wireless Sensor Networks made it possible to use in monitoring and control of greenhouse parameter in precision agriculture.In the Field bus concept, the data transfer is mainly controlled by hybrid system(wired and wireless) to automate the system performance and throughput. ZigBee protocols based on IEEE 802.15.4 for wireless system are used. The atmospheric conditions are monitored and controlled online by using Ethernet IEEE 802.3. Partial Root Zone Drying Process is implemented to save water. Also Controller Area Network (CAN) and Hybrid networks are used. It uses traditional communication system is used. The future research can be focused on Optical communication System with wavelength routing networks and can also be implemented using advanced ARM Controllers and core processors and also in energy saving, data fusion and other directions.

Nikhil Agrawal et al. (2015) [5], It proposes a design for home automation system using ready-to-use, cost effective and energy efficient devices including raspberry pi, arduino microcontrollers, xbee modules and relay boards. Use of these components results in overall cost effective, scalable and robust implementation of system. Use of these components results in overall cost effective, scalable and robust implementation of system. Drip irrigation system makes the efficient use of water and fertilizer. Freeduino flavor of arduino is used in this design. To start the drip irrigation system an email is sent to a defined account.The issue is that the the failure of any particular part or device is not informed and has to be tested manually. not efficient for large agricultural fields.

HemlataChanne1 et al. (2015) [2],it reviews the use of modernized techniques such as Internet-of-Things (IoT), Sensors, Cloud-Computing, Mobile Computing, Big-Data analysis in agricultural sector . Soil and environment properties are sensed and periodically sent to AgroCloud through IoT (Beagle Black Bone). Bigdata analysis on AgroCloud data is done for fertilizer requirements, best crop sequences analysis, total production, and current stock and market requirements. It is beneficial for increase in agricultural production and for cost control of Agro-products. The system does not include different soil nutrient sensors and does not produce accurate data.

3. RESULTS AND DISCUSSION

S.NO	PAPER	TECHNIQUES	RESULT	ISSUES
1	A Model for Smart Agriculture Using IOT	ZigBee with Wings	A complete real-time and historical environment information, efficient management and utilization of resources.	The technique can achieve convenient wireless connection only within a short-distance.
2	Automated Irrigation System Using a Wireless Sensor Network and GPRS Module	WSUs and a WIU, based on microcontroller, ZigBee, and GPRS technologies.	Feasible and cost effective for optimizing water resources for agricultural production.	The investment in electric power supply is expensive.
3	An Effective Method for Crop Monitoring Using Wireless Sensor Network	WSN with GSM technology.	Can collect data from locations previously inaccessible on a Micro -measurement scale.	Provides only precision values that is not accurate and is not cost efficient.
4	Automatic Control of Agricultural Pumps Based on Soil Moisture Sensing	For testing NI MULTISM simulation software is used .DIAC and TRIAC technique.	Achieves proper water management, saves human power and enhances crop or	Does not support several water levels and uses old techniques.

			productivity.	
5	Real - Time Automation and Monitoring System for Modernized Agriculture	Bus concept, ZigBee protocols based on IEEE 802.15.4, Hybrid network.	Monitoring and control of greenhouse parameter in precision agriculture.	Not energy saving and data fusion,directions are left for future research.
6	Smart Drip Irrigation System using Raspberry pi and Arduino	Raspberry pi, arduino microcontrollers, xbee modules.	Automates and regulates the watering without any manual intervention. Sending the emails to the system.	Failure of any particular part or device is not informed and has to be tested manually
7	Multidisciplinary Model for Smart Agriculture using Internet-of-Things (IoT), Sensors, Cloud-Computing, Mobile-Computing & Big-Data Analysis	(IoT), Sensors, Cloud-Computing, Mobile Computing, Big-Data analysis.	Beneficial for increase in agricultural production and for cost control of Agro-products.	Different soil nutrient sensors are not used.

4. CONCLUSION AND FUTURE WORK

Water being a precious resource must be utilized efficiently.Agriculture is one of those areas which consumes lot of water. Irrigation to the farm is a time consuming process and must be done on timely basis. As aimed through this work an auto irrigation system measuring the moisture content, humidity, astemperature, rain detection and the water level. Later harvesting the excess water from the cultivation field and recycled back to the tank. The developed system also alerts the farmer with buzzer when there is intruder(human/animal) into the farm.Thus the proposed system deals about the irrigation system in smart way using Internet of Things(IoT) which solved the current problems related to farming such as by reducing human efforts, wastage of water and updating the farmer about the live condition of the field on the mobile device. The work can be extended in such a way it detects plant disease,crop theft,use of modernized technique.

5. REFERENCES

[1] BezaNegashGetu, Hussain A. Attia, "**Automatic Control of Agricultural Pumps Based on Soil Moisture Sensing**", IEEE conference publication,2015.

[2] Hemlata Channe1, Sukhesh Kothari2, Dipali Kadam3, "**Multidisciplinary Model for Smart Agriculture using Internet-of-Things (IoT), Sensors, Cloud-Computing, Mobile-Computing & Big-Data Analysis**", International Journal of Int.J.Computer Technology &Applications,Vol 6 (3),May-June 2015.

[3] Joaquín Gutiérrez, Juan Francisco Villa-Medina, Alejandra Nieto-Garibay and Miguel ÁngelPorta-Gándara,"**Automated Irrigation System Using a Wireless Sensor Network and GPRS Module**",IEEE Transaction onInstrumentation and Measurement,Vol.63, No.1, January2014.

[4] MeenaKumari G, Dr. V .Vidya Devi, "**Real- Time Automation and Monitoring System for Modernized Agriculture**", International Journal of Review and Research in Applied Sciences and Engineering (IJRRASE) Vol3 No.1. PP 7-12 March 2013.

[5] Nikhil Agrawal, SmitaSinghal, "**SmartDrip Irrigation System using Raspberry pi and Arduino**", International Conference on Computing, Communication and Automation (ICCCA2015).

[6] Patil K. A, N. R. Kale, **" A Model for Smart Agriculture Using IoT"**, International Conference on Global Trends in Signal Processing, Information Computing and Communication,IEEE 2016.

[7] N.Shakthipriya, "**An Effective Method for Crop Monitoring Using Wireless Sensor Network**", Middle-East Journal of Scientific Research 2014.

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