

AGRICULTURAL IRRIGATION SYSTEM BASED ON IOT: A SURVEY BASED ON VARIOUS CONCLUSIONS

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Abstract:

India is an agricultural country with abundance of fertile lands. Nowadays, it's a challenge to improve the growth of plants and reduce usage of water in agricultural field. This is because of water scarcity which lead to defect of crop growth and lack of available water quantity. To bring out an efficient crop growth, various automation with water control technologies and notification method to farmers has been made. A survey to analyze the issues in the use of this technology has been made update with recent method.

Keywords — IoT, Sensors, GSM Technology

I. INTRODUCTION

Automatic irrigation is a new trend and emerging technology in agricultural fields. though, there are various methods are used in agricultural field, new technique with various feature will improve the system. the technique of automation has been implemented in which water control has been made in the field and notification with internet technology has been used which fits the evolving generation. irrigation is the supply of limited amount of water at regular intervals. this will lead to proper utilization of available water and avoid over flooding in agricultural fields.

Automation in agriculture will provide more facility to farmers and usage of water in the field is reduced. there are several other techniques are also used in agricultural irrigation. though there are several methods used, accuracy of water level is important. accuracy can be given in automatic irrigation.

Not only maintaining the accuracy, but also notification of agricultural field process is also important. notification of agricultural system will give about various information regarding hardware component in the field.

Hardware components can include about various modules which include temperature sensor, soil sensor, flood sensor, pressure sensor, etc. sensors

will maintain about various environmental conditions of the field. various sensors can be controlled by mobile applications. sensors can also be made wireless in the crop field. sensors will be used with internet connectivity. with the help of internet connections, water level and environment conditions can be delivered to the farmers. maintaining water level accuracy will lead to increase in crop production and it will be a great help in water scarce region with limited water availability.

Efforts need to be taken to improve various types of crop productivity with limited water supply with various technologies to enhance the development of agricultural field and reduce the impact of water scarcity in agriculture. internet of things will be useful in agricultural field. though several other technologies and applications are available.

II. RELATED WORKS

AjantaDasgupta, AyushDaruka, et al in [1] proposes irrigation system with automation system which becomes smart for agricultural production. Smart irrigation will make less amount of resource and solve water shortage problem. The whole method of irrigation system is monitored using various sensors. With various automation, there can also be various development in innovation.

In [2], VaishnaviBheemarao Joshi, R. H. Goudar have addressed Internet of Thing connectivity to agriculture. Internet of Thing is used to connect various agricultural production and electricity can be a problem in farm fields. Even though electricity is obtained and controlled, automation may lead to a problem in irrigation.

AashikaPremkumar, P Monishaa in their paper [3] have shown that automatic irrigation system with wireless sensor nodes. Sensors will control about various agricultural field. Increase in demand of water supply leads to automatic irrigation which will reduce the impact of overflow of water in agricultural field. Automation through sensor will not affect soil and fertilizer will also do not get washed away due to overwatering.

IoT- Based smart crop monitoring in farmland [4] by G. Naveen Balaji, V. Nandhini, et al have shown about usage of IoT sensors in farmland. For increase in productivity, there should be proper monitoring of farm field is important. Monitoring methods can be done through various sensor nodes. Monitored information need to be sent to the farmers. The information can be sent the farmers to various technology. In this paper, GSM technology is used to send the information. Monitoring will also help in reduced usage of water level in agriculture.

In [5], TiberiuMarinescu, NicoletaArghira, Daniela Hossu, IoanaFagarasan have shown about various monitoring of crop fields. Monitoring methods are included with air, moisture and temperature. In this paper, they shown about control strategies for irrigation and adequate supply of water is important for productivity. Informations are maintained and

controlled by programming through Embedded C. Technology used in this paper include Telemetry technology.

R. Nageswara Rao, B.Sridhar [6] made automate irrigation and monitoring of field through IoT technology. There are various problem in crop growth. Inorder to improve crop growth proper supply of water need to be made in agricultural field. Management of water should be made with automation. In this paper, water level is managed and data's about the field is maintained by Cloud computing, Raspberry pi and IoT technology. The data's are notified to farmers and calibration of sensor is found to be important.

Shiny Rajendrakumar in her paper [7] have shown that there is a wastage of water in agriculture without proper irrigation. The soil constituent can be based on composition but watering is considered to be important. The irrigation is done automatically but electricity is considered to be a problem. Passive infrared sensor is one of the technology used in this paper.

Rahul G. Ghodake, Altaf O. Mulani [8] in Micro controller based Automatic Drip Irrigation system does a research in drip irrigation automation system. By using automatic drip irrigation, proper planning of water supply can be made. There is a reduction of water level in agriculture and automation is required. Sensor technology and microcontroller is used and output should be displayed in digital form to the farmers.

Wafadiffallah, KhelifaBenahmed [9] using Smart irrigation technology for efficient water use Wireless sensor and Microcontroller technology for watering of agricultural field. Due to increase in water scarcity, proper watering is needed. Watering of field should be done in accurate level. They can be done in water scarce region. Along with microcontroller, IoT technology can be used which improves with internet connectivity.

Sandra Rhea Samson, S.Saranya [10] focuses on IoT based smart agriculture monitoring system. In

this paper, agriculture is considered as primary occupation and proper soil maintenance need to be done. Soil maintenance can also be done using monitoring. Soil should be monitored and moisture level in soil need to be detected. In this paper, IoT and Wi-fi technology is used. In this paper, smart agriculture is done for limited amount of land. Sensors also need to be properly maintained.

G. Nagarajan [11] using the technology of Zigbee and microcontroller analyzed the demand in water supply to the crop field. Sensor system is used in agricultural field and it need to be automated. Wireless soil monitoring sensor is used and it can help in reduction of water level in the field. Various sensor need to be maintained along with ph level of water quality. Water quality need to be maintained for irrigation system. With the advancement in communication technology automatic display to user mobile phone can be made.

In [12], Dr.M.NewlinRajkumar, S.Abinaya, have addressed the demand of crop growth and deficiency of water supply. Water control is considered to be the most important thing in agriculture. Water control is done by detecting through sensors. Sensors are maintained through IoT technology. In future, they can be made notified to the farmers.

SrishtiRawal in [13] gives about smart irrigation system. Microcontroller and GSM-GPRS technology is used. This paper shows about soil moisture content is detected for every one hour. Automatic pumping to water the plants can be used in the field.

Automatic Agricultural Land Irrigation System by Fuzzy Logicin [14] by ZohaibMushta, SyedaShaima Sani, ,KhizarHamed, Amjad Ali gives about irrigation with hybrid power, water, time and energy. Agricultural land irrigation system and MATLAB technology is used. Electricity cost is very high factor for tube well operation. Electric motors are used in this system so availability of power is main concern for motor operation for all time in day and night. The design of a controller for

automatic irrigation control system is a positive step towards water and power optimization. This system can also be implemented to existing tube wells working in fields.

Shiny Rajendrakumar, Rajashekarappa, et al [15] focuses on IoT technology. Due to water scarcity, farmers are suffering for irrigation and information about the crop is not notified to the farmers.Determining about soil health and crop selection is important. IOT is found to be an important technology in farming.

III.CONCLUSIONS

Survey on agricultural field and water supply to the crop field and agricultural technology has been analyzed.

REFERENCES

- 1) A. Dasgupta, A. Daruka, A. Pandey, A. Bose, S. Mukherjee, and S. Saha, "Smart irrigation: Iot-based irrigation monitoring system," in *Proceedings of International Ethical Hacking Conference 2018*. Springer, 2019, pp. 395–403.
- 2) V. B. Joshi and R. Goudar, "Iot-based automated solution to irrigation: An approach to control electric motors through android phones," in *Recent Findings in Intelligent Computing Techniques*. Springer, 2019, pp. 323–330.
- 3) A. Premkumar, K. Thenmozhi, P. Praveenkumar, P. Monishaa, and R. Amirtharajan, "Iot assisted automatic irrigation system using wireless sensor nodes," in *2018 International Conference on Computer Communication and Informatics (ICCCI)*. IEEE, 2018, pp. 1–4.
- 4) G. N. Balaji, V. Nandhini, S. Mithra, N. Priya, and R. Naveena, "IoT based smart crop monitoring in farm land," *Imperial Journal of Interdisciplinary Research (IJIR)* Vol, vol. 4, pp. 88–92, 2018.
- 5) T. Marinescu, N. Arghira, D. Hossu, I. Fagarasan, I. Stamatescu, G. Stamatescu, V. Calofir, and S. Ilescu, "Advanced control strategies for irrigation systems," in *2017 9th IEEE International Conference on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications (IDAACS)*, vol. 2. IEEE, 2017, pp. 843–848.
- 6) R. N. Rao and B. Sridhar, "Iot based smart crop-field monitoring and automation irrigation system," in *2018 2nd International Conference on Inventive Systems and Control (ICISC)*. IEEE, 2018, pp. 478–483.

7) S. Rajendrakumar, V. Parvati et al., "An efficient irrigation system for agriculture," in *2018 International Conference on Communication, Computing and Internet of Things (IC3IoT)*. IEEE, 2018, pp. 132–136.

8) R. G. Ghodake and A. O. Mulani, "Microcontroller based automatic drip irrigation system," in *Techno-societal 2016, international conference on advanced technologies for societal applications*. Springer, 2016, pp. 109–115.

9) W. Difallah, K. Benahmed, F. Bounaama, B. Draoui, and A. Maamar, "Smart irrigation technology for efficient water use," in *Proceedings of the 7th International Conference on Software Engineering and New Technologies*. ACM, 2018, p. 25.

10) N. Suma, S. R. Samson, S. Saranya, G. Shanmugapriya, and R. Subhashri, "Iot based smart agriculture monitoring system," *International Journal on Recent and Innovation Trends in computing and communication*, vol. 5, no. 2, pp. 177–181, 2017.

11) G. Nagarajan and R. Minu, "Wireless soil monitoring sensor for sprinkler irrigation automation system," *Wireless Personal Communications*, vol. 98, no. 2, pp. 1835–1851, 2018.

12) M. N. Rajkumar, S. Abinaya, and V. V. Kumar, "Intelligent irrigation system—an iot based approach," in *2017 International Conference on Innovations in Green Energy and Healthcare Technologies (IGEHT)*. IEEE, 2017, pp. 1–5.

13) S. Rawal, "Iot based smart irrigation system," *International Journal of Computer Applications*, vol. 159, no. 8, pp. 7–11, 2017.

14) Z. Mushtaq, S. S. Sani, K. Hamed, A. Ali, A. Ali, S. M. Belal, and A. A. Naqvi, "Automatic agricultural land irrigation system by fuzzy logic," in *2016 3rd International Conference on Information Science and Control Engineering (ICISCE)*. IEEE, 2016, pp. 871–875.

15) S. Rajendrakumar, V. Parvati, B. Parameshachari, K. S. Soyjaudah, R. Banu et al., "An intelligent report generator for efficient farming," in *2017 International Conference on Electrical, Electronics, Communication, Computer, and Optimization Techniques (ICEECCOT)*. IEEE, 2017, pp. 1–5.