Monitoring and Controlling for Agricultural Land

Ye Naing
GIS Lab, UCSY
Myanmar
yenaing1@ucsy.edu.mm

Thin Lai Lai Thein
GIS Lab, UCSY
Myanmar
tllthein@ucsy.edu.mm

***Abstract*— Myanmar is an agriculture-based country. As a developing country like Myanmar, agriculture plays a very important role in improving the country's economy. Farmers need to be extra careful to avoid crop damage caused by climate change. Smart agriculture will allow farmers to monitor their crops in real-time to ensure that their crops are not damaged. Therefore, traditional methods should be combined with the help of IoT technology to make crops more productive and less wastage. Based on the information obtained through IoT sensors, it will be used in agriculture fields. In this paper, using Raspberry Pi, it is a system that can monitor crop damage from sensors. The purpose of this paper is that agriculture technology is the most important thing for humans in the world, so it is created using IoT technology. In this paper, smart agriculture system will estimate the conditions of farmland such as soil, temperature, water level and rainfall. After that, IoT technology is used to help agricultural land and presented.**

Keywords—smart agriculture, Raspberry Pi, Sensors, Internet of Things, wireless sensor network, wireless node

I. Introduction

In the agriculture sector, IoT-based smart agriculture methods should use rather than conventional methods. The proposed system provides information on agricultural land and surrounding climate at alert level. This system is composed of sensors, microcontroller (Node MCU) and raspberry pi. This proposed system implements the effective monitoring for smart agriculture system based on wireless sensor networks (WSN). Soil moisture sensor will measure the amount of moisture in the soil. The temperature sensor will measure of the plantation environment. The water level sensor will measure the level of water entering the plantation. After that, the rainfall sensor will be used to detect the rainfall. All these sensors collect the necessary data for agricultural land such as humidity, temperature, amount of water infiltration and rainfall. All sensors are connected to wireless nodes. Wireless nodes send the sensing data to the control center through Radio Wave and Raspberry Pi. When sending like that, the sensing data send from the microcontroller (Node MCU) to the Radio Wave. The Radio Wave sends the sensing data to the Raspberry Pi in the control center. MQTT (Message Queue Telemetry Transport) protocol is used to communicate between the sensor nodes and Raspberry Pi).

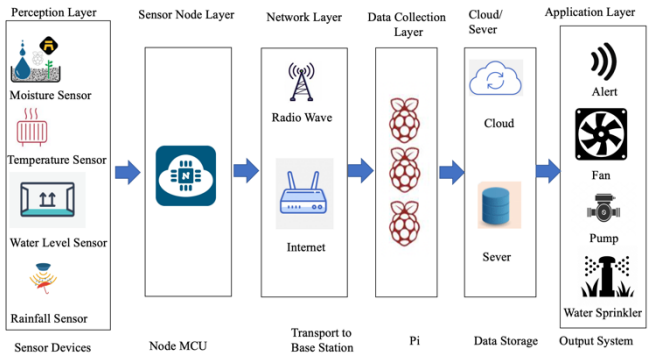
Some reports presented smart agriculture using IoT and Machine Learning. In paper [1] describes IoT based Smart Agriculture system, which would help farmers, get recommendations based on various factors like humidity, temperature, pH, moisture and rainfall. The system would also focus on suggesting fertilizers to farmers as well based on factors such as nitrogen, phosphorus and potassium levels of the soil. In paper [2] describes automated Smart Agriculture system which reduces the time and resources that is required while performing it manually. This system uses the technology of Internet of Things. The system also measure moisture of soil and level of water in fields.

In paper [3] describes focusing on smarter and efficient way of cultivation is crucial. The improvement of new practices of increasing crop yield and handling, recently youth are inclining towards agriculture and choosing it as a profession. Technology like IoT helps them to simplified way of cultivation and monitoring crops by accessing the information using mobiles and internet. Taking these factors into consideration, this paper highlights the major role of technologies, mainly IoT, which makes the farming smarter to meet the expectations in future.

II. System Architecture

A. Architecture of Monitoring and Controlling

If the value of the sensing data obtained from the soil moisture sensor exceeds the threshold value, it signals the warning system that there is a lot of moisture in the agricultural land. If the agricultural soil is too moist, the roots of the crops may be damaged. If the value of the sensing data from the temperature sensor exceeds the set forest temperature for the plants to survive, the air conditioning system should work. If the inflow of water into the agricultural land is exceeded, the irrigation machines must be stopped to prevent water from drying out. After that, check whether there is rain for the crops and control to operate the sprinkler system.



III. Conclusion

The proposed system based on wireless sensor network is very beneficial for protecting agricultural land. This system helps farmers to save costs and not damage the agricultural land. Agricultural land can be monitored by workers, but it is important to have accurate information in real time. More productive crops can help the country's economy.

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