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ANALYSIS ON MONITORING & CONTROLLING SYSTEM OF GREENHOUSE

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Abstract – *Greenhouse management system offers to increase the productivity of crop by controlling various parameters. As technology develops, there is so many enhancements done in greenhouse system. Emerging embedded system with wired/wireless system, real time monitoring can be possible. Now a day, energy saving also becomes important aspect in every field. This paper describes the analytic overview on different method to monitor & control greenhouse.*

Keyword*- Greenhouse monitoring & controlling; real time monitoring; energy saving; analytic overview*

I. INTRODUCTION

Mostly the world & people are dependent on agriculture & their productivity. Because there is a lot of fluctuation in atmosphere, people cannot predict that deviation & not obtain enough productivity. So there is requirement of technology in that direction which provide to fulfill the criteria for crop to develop& corresponding atmospheric parameter condition. Greenhouse also helpful in nursery for orchid breeding, vegetables, fruits, and transplants.

[12] Idea of growing plants in environmentally controlled areas has existed since roman times. In the 13thcentury, greenhouses were built in Italy. They were originally called giardini botanici(botanical gardens).Then, in 1450, sanga yorok written description of greenhouses which was designed to regulate the temperature and humidity requirements of plants & crops. As the time passed, every country adopts the greenhouse system with some enhancement.

With the help of greenhouse, it may enable to grown a selected crop through the year. Therefore, greenhouse monitoring & controlling become essential this days.

II. LITERATURE REVIEW

Due to development in agriculture field, there are many ways to monitor & control the various parameters like temperature, humidity, soil moisture, light intensity. System can be wired or wireless. In the wired system, power source is wire. This system more reliable but complex to handle. When in wireless sensor network, power source of node is battery but it has also a drawback relative to battery which is of limited capacity. To overcome this drawback AODTPC (adaptive on demand transmission control protocol) protocol with kalman estimator is used. [5]

In WSN, there are also many ways to monitor the greenhouse. Bhaviskar et al [13] adopted ZigBee protocol in which they divided system into two partPCN (portable controller node) system &SAN (sensor & actuator node) system. PCN system consist laptop/PC & Xbee transceiver. A GUI application provides real time monitoring & controlling of various parameters & remote control. SAN system consist sensor node & actuator node. At sensor node, it senses various parameters and transmits to PCN system. At actuator node, it performs the switching operation.

Liu et al. [8] proposes design of greenhouse dividing in two framework. First part consist several sensor nodes which were used to measure different parameter. In that, sink node install inside the greenhouse to collect the data [10] & transferred to remote PC. Second part consist GSM module & management software. Authors analyzed the result of sensors &RSSI (received signal strength) value.

Ling et al. [6] proposed a monitoring system with ZigBee module [1] which is interfacing with microprocessor C8051F. They also provided the flow chart of network address searching & mode of transmission

Yeh et al. [3] build a mobile nursery for orchid breeding using ARM9 processor interfacing with PC based server. They were showing standard deviation improvement for temperature & humidity.

Another advancement in controlling tool is that Hanggoro et al. [2] demonstrate design of greenhouse monitoring &controlling using Android mobile application. They were concentrated in humidity level of greenhouse using Ardunio UNO processor interfacing with Android mobile application.

Sahu [4] monitor & control the greenhouse using microcontroller AT89C51 & shown the result analysis of transducer readings.

Sometimes robot also placed in farm to monitor the farming status with the help of sensors. [9] [11].

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