Available Online at www.ijcsmc.com

International Journal of Computer Science and Mobile Computing

A Monthly Journal of Computer Science and Information Technology

ISSN 2320–088X

IJCSMC, Vol. 4, Issue. 6, June 2015, pg.416 – 418

RESEARCH ARTICLE

An Overview on Wireless Sensor Technologies for the Development of Agriculture

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Abstract— This paper provides an overview on recent development of wireless sensor technologies which will useful for developing the wireless network for the development of agriculture methods and also provides the standards for wireless communications as applied to wireless sensors. Different sensors are used like Temperature Sensor, Humidity Sensor and Soil Moisture Sensor for the field data and central server for the data processing.

Keywords— Temperature Sensor, Humidity Sensor, Soil Moisture Sensor, central server

I. INTRODUCTION

Agriculture has played a major role in human history; human developed different methods for the development of crops, these methods are applied to the crop by checking the atmospheric conditions. The agricultural progress has been a crucial factor in worldwide social and economic change. In the traditional methods human labour will provides the weather and land condition, according the condition discussion will be taken. In this paper presents we will discuss latest and advanced system which will provides the different data from the different types of sensors like Temperature Sensor, Humidity Sensor and Soil Moisture Sensor. From the literature survey it is found that this agriculture system based on three module i.e. Agriculture environmental parameters measurement, which will be received from the different sensor, The Data are received by the central monitoring server, which will be transfer or received different module like ZigBee and third module the central server which provides the result. Fig. 1 provides the basic methodology of the system.

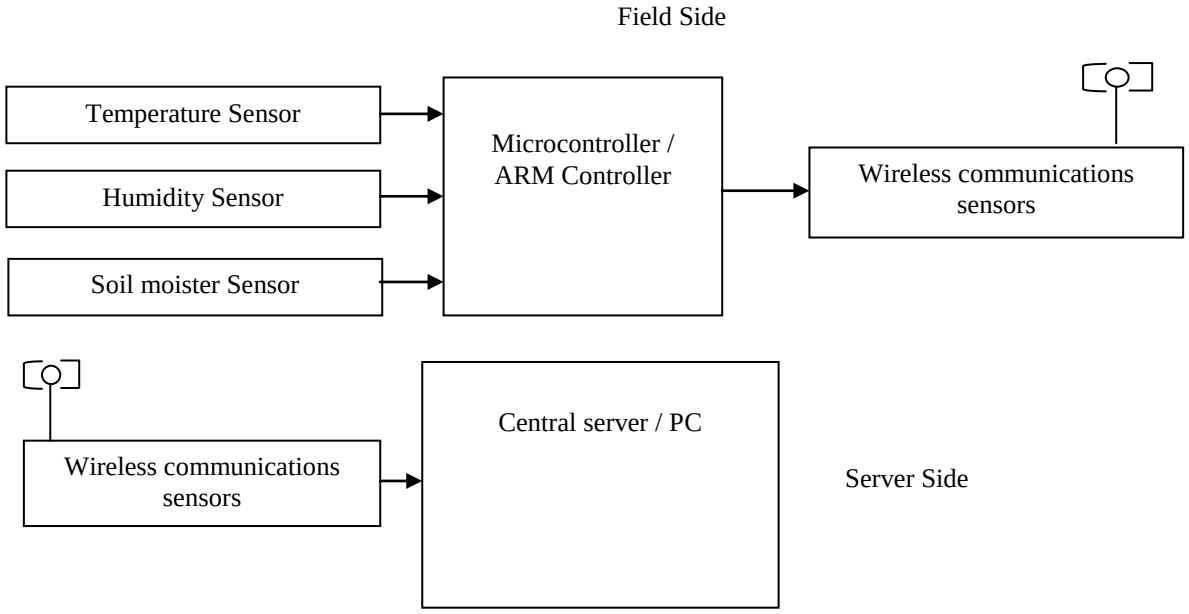

Fig. 1 Basic methodology of the system

II. LITERATURE SURVEY

Xiaolu Xi et al. [1], presents low power AMT acquisition network based on ZigBee and GPS. This AMT acquisition system is based on GPS, ARM and data acquisition module. Using ZigBee network power supply of all module i.e. GPS, ARM and data acquisition module and induction coil can be switch off or on. In this system clock signal timing signal is provided by the GPS module to the data acquisition module where as ARM based embedded module contains, AT91RM9200, 64MB NOR flash, Ethernet, 64 MB-SDRAM, 1GB NAND flash and WI-FI, which is useful for data acquisition, self testing and calibration in AMT exploration. In this system, data acquisition module contains 8-channel, 4 channels for 24 bit ADC and 4 channels for signal conditioning of weak AMT signals. These signals are filters by using low power differential and audio amplifiers. This system practically tested in Tibet.

GopalaKrishna Moorthy et al. [2], presents a wireless remote monitoring system for agriculture using Zigbee. Proposed system develops a smart wireless sensor network (WSN) for an agricultural environment. Monitoring agricultural system detects environment factors such as temperature and humidity along with other factors can be of significance. Different nodes send data wirelessly to a central server. This server collects the data, stores it and will allow it to be analyzed then displayed as needed and can also be sent to the client mobile. This system cheaper in cost consumes less power and can control 254 devices or nodes.

Raul Morais et al. [3], presents a part of a long-term effort to introduce precision viticulture. This precision viticulture is the region of Demarcated Region of Douro. This agriculture system presents the architecture, hardware and software of a platform designed for that purpose called as MPWiNodeZ. This MPWiNodeZ is also a ZigBee network element, provides a mesh-type array of acquisition devices ready for deployment in vineyards. This MPWiNodeZ also provides general-purpose wireless acquisition device for remote sensing in large coverage areas. The testing of the system was done in two stages, laboratory and vineyard. In the first test i.e. in the laboratory, to validate the power management and networking solutions under particularly severe conditions and the second stage was done in a vineyard. System was provides good performance.

Dr. K.Srinivasa Ravi, K.Tapaswi, B.Lokesh, and G.Sai Krishna [4], present a smart sensor system for agricultural chronology. This system is based on preliminary design on the real-deployment of WSN for paddy cropping, Banana and Turmeric fields in our nearby localities. This system required low power consumption for the new design architecture to cater the most important and it is critical issue nowadays in WSN monitoring.

Data takes from the different Sensor like Temperature Sensor like THERM200 is a soil temperature probe, which has a temperature span from -40°C to 85°C, Humidity Sensor like SY-HS-220 produces the Dc output voltage 1980 mV at 250C and 60% RH, Soil Moisture Sensor like VH400-Soil Moisture Sensor Probe to the central data processing system.

D. D. Chaudhary et al. [5], presents a wireless sensor networks for greenhouse parameter control in precision agriculture. In the green house it is necessary to choose correct method for crop, choosing of method is depend upon the different parameter like weather conditions, soil structure and variety of crops cultures. These parameters of greenhouse are requiring a detailed analysis in order to choose the correct method. By using wireless sensor technologies and miniaturized sensor devices, it is possible to uses them for automatic environment monitoring and controlling the parameters of greenhouse for Precision Agriculture application. This paper or system provides analysis and the use of Programmable System on Chip Technology (PSoC) as a part of Wireless Sensor Networks (WSN) to monitor and control various parameter of green house.

Prof C. H. Chavan and Mr. P. V. Karande [6], presents a wireless monitoring system of soil moisture, temperature & humidity using zigbee in agriculture. This system contains a smart wireless sensor network (WSN) for an agricultural environment which will monitor agricultural environment for various factors like as soil moisture, temperature and humidity along with other factors can be of significance. This system will removes the traditional approach to measure these factors in an agricultural environment that is manually taking measurements and checking them at various times. This remote monitoring system uses Zigbee for wireless connectivity. Central server received data from the different nodes and collects the data, stores it and will allow it to be analyzed then displayed as needed and can also be sent to the client mobile.

Prof. Mrs. S. S. Patil, Prof. V. M. Davande and Prof. J. J. Mulani [7], presents the Smart Wireless Sensor Network for monitoring system for an Agricultural Environment. It is very difficult to monitor environmental conditions and planning the correct method for crop. This system is based on the Zigbee smart sensing platform for monitoring environmental parameters. The center server i.e. the smart weather station consists of microcontroller based measuring units which collect the values from the different nodes, values like the temperature, relative humidity, water level and soil moisture and stores and displays them into a database. Embedded C and Visual Basic 6.0 methods are used to create the graphical user interface (GUI).

III. CONCLUSION

This paper provides a basic idea to develop agriculture system using wireless sensor technologies. Literature survey provides the existing agriculture system.

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