ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol3, Issue 5, May 2016

Agrikart: A New Revolution Agriculture

[1] Dr. B Shadaksharappa, [2] Mr. Venkatesh Kumar M, [3] Rajesh G,[4] S Srijayanth,[5] Mrs. Myneni Chandana, [6] Chaithra R S
[1] Head,Department of Computer Science and Engineering,
[2] Sr. Lecturer, Department of Computer Science & Engineering,
[3,4,5,6] UG Scholars, Department of Computer Science and Engineering,
Sri Sairam College of Engineering, Bengaluru, India

***Abstract*— The project is based upon Wireless Sensor Network and an android based interface. The advanced development in wireless sensor networks can be used in monitoring various parameters in agriculture. Due to uneven natural distribution of rain water, it is very difficult for the farmers to monitor and control the distribution of water to agricultural field as per the requirements of the crop. There is no ideal irrigation method for all weather conditions, soil structure and variety of crop cultures. The sensors are used to collect various data which is to be then analyzed. The android interface provides the farmer with a framework to communicate with experts and get immediate response. It also provides them detailed information about the governmental policies which they can make use of. The main motive of this idea is to provide the analyzed soil sample and the best suggestion on which crop will minimize the cost and maximize the profit. The application also gives specific weather predictions for the day/week. Details on agricultural loans with their interest rates are also shown in the android application interface. This project aims to reduce the stress and problems that adversely affect the farmers resulting in the loss of crops and human lives.**

***KEYWORDS*:Agriculture, Irrigation, GSM, Android Application.**

I. INTRODUCTION

Global environmental changes are currently altering key ecosystem services that soils provide. Therefore, it is necessary to have up to date soil information on local, regional and global scales to monitor the state of soils and ensure that these ecosystem services continue to be provided. In this context, digital soil mapping (DSM) aims to provide and advance methods for data collection and analysis tailored towards detailed large-scale mapping and monitoring of soil properties. In particular, remote and proximal sensing methodologies hold considerable potential to facilitate soil mapping at larger temporal and spatial scales as feasible with conventional soil mapping methods. Existing remote and proximal sensing methods support three main components in DSM: (1) Remote sensing data support the segmentation of the landscape into homogeneous soil-landscape units whose soil composition can be determined by sampling. (2) Remote and proximal sensing methods allow for inference of soil properties using physically-based and empirical methods. (3) Remote sensing data supports spatial interpolation of sparsely sampled soil property data as a primary or secondary data source overall, remote and proximal sensed data are an important and essential source for DSM as they provide valuable data for soil mapping in a time and cost efficient manner.

This document provides general insights into diverse aspects of soil related remote sensing, including DSM, remote sensing technologies and soil properties. In this context, we present the underlying concept of DSM and introduce approaches to predict the spatial distribution of soil properties. Monitoring agricultural environment for various factors such as soil moisture, temperature and humidity along with other factors can be of significance. A traditional approach to measure these factors in an agricultural environment meant individuals manually taking measurementsand checking them at various times. As the smart phones users in INDIA are increasing and as the country is moving towards digitalization, our android based application can be at service for many farmer and thus helping them move towards the digital world. It can provide the necessary soil and crops related information for better productivity.

II. OBJECTIVE

AGRIKART is an android based application interface that is useful throughout all the stages of agriculture. The main objective of this project is to bring a new revolution in agriculture with technology. The project deals with the irrigation methods, soil samples, weather conditions and agricultural loans using wireless sensor networks.

III. AIM

This project aims to reduce the stress and problems that affect farmer and their crops which ultimately result in loss of crops and lives.

IV. LITERATURE SURVEY

1.Wireless Monitoring of Soil Moisture, Temperature & Humidity Using Zigbee in Agriculture

ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol4, Issue 4, May 2017

Author: Prof C. H. Chavan, Mr.P. V.Karande[2014]

Zigbee-based agriculture monitoring system serves as a reliable and efficient system for monitoring agricultural parameters. The corrective action can be taken. Wireless monitoring of field not only allows user to reduce the human power, but it also allows user to see accurate changes in it. It is cheaper in cost and consumes less power. The GDP per capita in agro sector can be increased. This project can be extended for cattle monitoring. We have designed ZigBee wireless sensor network for monitoring the crop field area by deploying moisture sensors in the land to detect the places where the water level is low. From those results we can irrigate to that particular place only. So we can conserve water and minimize the problem of water logging in the land.

2.Monitoring for Precision Agriculture using Wireless Sensor Network-A Review

Author: AnjumAwasthi& S.R.N Reddy[2013].This paper explores the potential of WSN in the area of agriculture in India. Aiming at the sugarcane crop, a multi-parameter monitoring system is designed based on low-power ZigBee wireless communication technology for system automation and monitoring. Real time data is collected by wireless sensor nodes and transmitted to base station using zigbee. Data is received, saved and displayed at base station to achieve soil temperature, soil moisture and humidity monitoring. The data is continuously monitored at base station and if it exceeds the desired limit, a message is sent to farmer on mobile through GSM network for controlling actions. The implementation of system software and hardware are given, including the design of wireless node and the implementation principle of data transmission and communication modules. This system overcomes the limitations of wired

sensor networks and has the advantage of flexible networking for monitoring equipment, convenient installation and removing of equipment, low cost and reliable nodes and high capacity.

3. A Test-bed on Real-time Monitoring of Agricultural Parameters using Wireless Sensor Networks for Precision Agriculture

Author: SiuliRoy ,SomprakashBandyopadhyay[2015]

A sensing system combined with IEEE 802.15.4/Zigbee based wireless networking [8] has been tested to be quite effective. We have observed that wireless transmission range varies with humidity and environment condition. On that basis we have to design the placement of routers in a network. If possible then number of routers should be increased. The routers should be encased in such a way that it can tolerate sudden weather damage like rain falling, storm etc. To use this system in a crop field or in other greenhouses, the Maxstream-Pro with whip antenna is recommended for routers. The whip antenna rarely varies in case of range. It is very difficult for a router placed in ground level to send data to another router which is placed in 2nd or 3rd floor of a building. So in that case both the router should be elevated somehow to be in line of sight.

4. A Zigbee Based Smart Sensing Platform for Environmental Monitoring

Author : Mane S.P. , Kavathekar G.S. , Jadhav S.T.

In this paper we proposed an environmental monitoring system with a Star network structure controlled by a central station. The different stations are equipped with temperature, relative humidity, sunlight and Wind Speed sensors. Initial component testing of sensor performance has reflected good results in sensing and radio communication. The outcome provides a variable platform for different sensors to measure necessary values. In future we can add GSM module at coordinate side of developed system to get records on Mobile phones.

5.Zigbee based Wireless Sensing Platform for Monitoring Agriculture Environment

Author: N.Krishna Chaitanya.

Sensors and ZigBee are interfaced to microcontroller. The sensed parameters are displayed on LCD display. The received parameters are continuously displayed on graphical user interface and the data and time of each value is stored in system database, the below table II shows the results stored in Micro Soft Access Database. Hence, the project agriculture monitoring is designed and developed using ARM. The developed system is successful in measuring the dryness of the soil, relative humidity and temperature. The values received are stored in system database are used for further analysis.

V. EXISTING SYSTEM

Over the past decades, the Earth's surface has witnessed major changes in land use and land cover. These changes are likely to continue, driven by demographic pressure and by climate change. As part of the Earth's spheres, the pedosphere is responding and contributing to

ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol4, Issue 4, May 2017

these environmental changes. Observed changes in the functioning of the pedosphere renewed the recognition that soil resources provide key ecosystem services and play a fundamental role for assuring food security. In this context, monitoring tools are needed for maintaining a sustainable ecological status and improving soil conservation. The implementation of sustainable agricultural, hydrological, and environmental management requires an improved understanding of the soil, at increasingly higher resolutions. Information on spatial and temporal variations in soil properties are required for use in conservations efforts, climate and ecosystem modeling, as well as engineering, agricultural, forestry applications, erosion and runoff simulations. Irrigation of plants is usually a very time consuming activity; to be done in a reasonable amount of time, it requires a large amount human resources. Some systems use technology to reduce the number of workers or the time required to water the plants. With such systems the control is very limited and many resources are still wasted. Water is one of these resources that are used excessively. Mass irrigation is one method used to water the plants. This method has massive loss since the amount of water given in excess of the plant needs. There are also many miss conceptions as to cultivate what type of crops in what type of cultivation lands available.

VI. DRAWBACKS

- Farmers are not aware of the changes in the soil due to the environmental changes.
- To transfer the knowledge to the farmers is difficult.

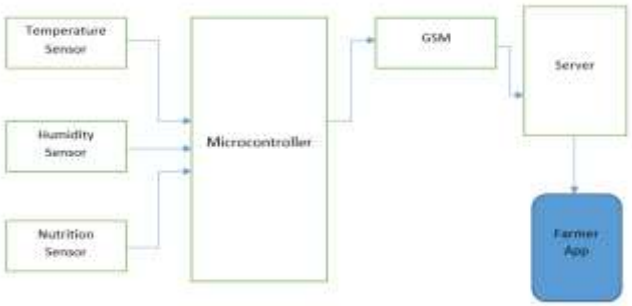
VII. PROPOSED SYSTEM

The proposed hardware of this system includes 8 bit AVR, GSM module, Temperature, humidity, soil moisture sensors and soil ingredients sensors, LCD. The system is low cost & low power consuming so that anybody can afford it. The data monitored is collected at the server. It can be used in precision farming. The system should be designed in such a way that even illiterate villagers can operate it. They themselves can check different parameters of the soil like salinity, acidity, moisture etc. from time to time. During irrigation period they have to monitor their distant pump house throughout the night as the electricity supply is not consistent. The system can be installed at the pump house located remotely from the village, it is interfaced with the pump starter & sensors are plugged at different location in the field for data acquisition. Using this system they can switch on their pump from their home whenever they want. To overcome the shortcomings of the existing system we are planning to implement wireless sensor network with which the data about the soil is collected and then sent to the farmer via an android application interface. The android application interface also provides specific weather predictions for the rest of the week which help the farmer to plan accordingly and to manage his vital resources. The app also provides complete details on agricultural loans, their interest rates of many nationalized banks across the country helping the farmer choose the best in the lot and also gives the Governmental policies available across the country.

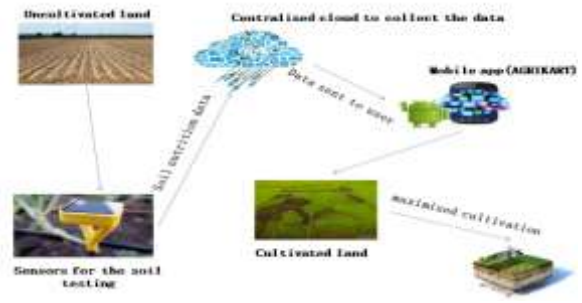
VIII. ADVANTAGES

- Real time data is transferred to the farmers.
- Better productivity.
- Good quality of corps.
- Easy for farmers.
- Farmersget the tips and genuine suppliers details in the app.
- Audio alert and notification.

IX. THE BLOCK DIAGRAM



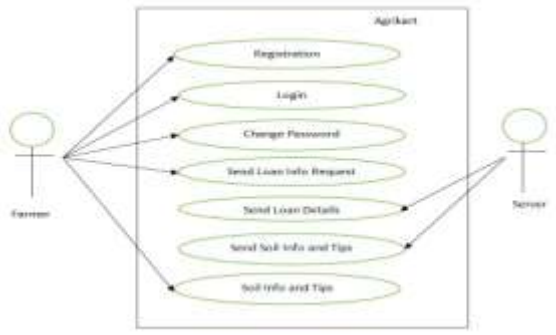
X.WORKING PRINCIPLE



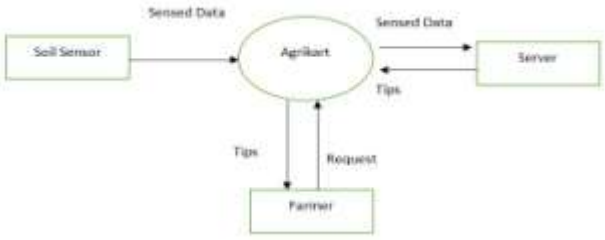
ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol4, Issue 4, May 2017

XI. USE CASE DIAGRAM



XII. DATA FLOW DIAGRAM



XIII.HARDWARE REQUIREMENTS

Processor : Intel i3
Ram : 2GB
SPEED : 2.4 Ghz
Android Phone
Microcontroller- ATMEGA 8/ ATMEGA 16
Temperature Sensor
Humidity Sensor
Nutrition Sensor
Beeper
GSM Sim 900

Power Supply
i. Transformer
ii. Diode
iii. Resister
iv. Capacitor
v. LED

XIV. SOFTWARE REQUIREMENT

1. AVR Studio
2. Embedded C
3. Java
4. Android Studio
5. Mysql
6. Netbeans

XV.CONCLUSION

Sensor-based agriculture monitoring system serves as a reliable and efficient system for monitoring agricultural parameters. The corrective action can be taken. Wireless monitoring of field not only allows user to reduce the human power, but it also allows user to see accurate changes in it. It is cheaper in cost and consumes less power. The GDP per capita in agro sector can be increased. This project can be extended for cattle monitoring. This Idea aims to provide an optimized and a well-structured framework to the farmer which helps the farmer both mentally and financially for better results. This idea also helps in maximized optimization of all the vital resources.

REFERENCES

- http://www.knowledgebank.irri.org/step-by-step-production/growth
- http://www.knowledgebank.irri.org/decision-tools/rice-doctor
- http://www.knowledgebank.irri.org/step-by-step-production/growth
- http://en.wikipedia.org
- http://msdn.microsoft.com/en-us/library/windows/apps/hh464924.aspx
- http://people.csail.mit.edu/sparis/bf_course/course_notes.pdf