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Assimilation of Intelligent Cloud & IoT based Water Management System and Accumulates Crop Information

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***Abstract*—**Agriculture is a backbone of Indian economy. As India to become a super power, the large development is required in the field of agriculture. Agriculture development will strengthen the Indian economy this will also take small rural areas into limelight and will reduce burden on metros. This project will suggest best irrigation & nutrition management system to the farm and can be remotely operated or controlled by using SMS control. This will provide ideal irrigation conditions by sensing moisture in soil . This helps in preventing drought conditions and water logging also maintains productivity of a soil.

Keywords- *agriculture; SMS; moisture*

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I. INTRODUCTION

Irrigation is the process of providing the water to the farm. Usual method of providing water to the farm is rain, hand pump, motor, drip sprinkler etc. All except rain are manually controlled and requires labor for the same. This method sometimes causes water logging if excess water remains in the farm. If there is an insufficient rain then it causes drought. The first and foremost intention is to supply sufficient and correct water supply to the farm.

There is a requirement of a plant nutrition's N, P, K . we are also going to supply through the irrigated water , hence the nutrient management is not the issue left. They are given to the farm on the basis of crop taken and land requirement.

This will help to save water, human efforts and unnecessary stress of water management and requirement of actual presence of human being at the farm as we can switch ON and OFF motor remotely and can observe the status of the plant at any time and location.

This system uses SMS controlling as Wifi has some range issue in farm land and Bluetooth has limited range so we thought SMS controlling is the best suited option for the system.

II. IMPORTNACE OF IRRIGATION

A. Large agreecultre of India depends upon monsoon or ceased mansoon largely affect the agreeculture which forces country drought conditions.

B. *Multiple cropping is not possible as only four months rain is available so multiple crop cannot be taken and this reduces yield in agreeculture.*

C. Mansoon certianly is a major issue as it is only only for four months from June to Septmber after that eight months are almost going without rain.

D. Using provision of irrigation eight months of dry period can be managed and crop yield can be taken in that phase as well.

E. Proper management of water using irrigation can provide a good quality as we provide a required amount of water to the crop as when required so we can get a good quality yield.

F. Irrigation helps in multiple crop yield with constant quality of crop product using small amount of water.

III. LITERATURE REVIEW

As a part before starting of project, we visited some farms and had discussion with farmers, we came to know about how things are manually occurs and how can we automate them causing optimum utilization of resources and reduces wastage.

In our proposed system, we are going to use water wisely and will avoid wastage in areas where there is less availability of water, system can be employed.

Previously farmers use to start motor for specific time in order to provide water to the plant, sometimes it is less then required and may be sometimes more than required. All areas are not evenly provided with water using manual system. By proposed system we overcome this fall as as per the crop taken

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in the farm we select appropriate moisture level and depending upon the moisture level selected we calculate the deviation in moisture level and can work accordingly.

This system can be used in preinstalled drip irrigation with minimal changes, over the drip irrigation which is usually made ON and OFF manually.

IV. ARDUINO-UNO

Arduino is an open source computer hardware and software company and user community that designs projects and manufactures single board microcontroller and microcontroller kit for building digital devices and interactive objects that can sense and control objects in the physical world. The projects product are distributed as open source hardware and software, which are licensed under the GNU Lesser General public License (LGPL) or the GNU General Public License(GPL), permitting the manufactures of Arduino boards and software distribution by anyone.

Most Arduino boards consist of an Atmel 8-Bit AVR microcontroller (ATmega8), ATmega168, ATmega328, ATmega1280, ATmega2560) with varying amounts of flash memory, pins and features. The 32 Bit Arduino Due, based on the Atmel SAM3X8E was introduced in 2012. The boards use single or double-row pins or female headers that facilitate the connections for programming and incorporation into other circuits. These may connect with add-on modules terms shields. Multiple and possibly stacked shields may be individually addressed via an I^2C serial bus. Most boards include a 5V linier regulator and a 16 MHz crystal oscillator or ceramic resonator. Some design such as the Lilypad, run at 8 MHz and dispense with the onboard voltage regulator due to specific form-factor restrictions.

V. GSM 900A MODULE

This is an ultra compact and reliable wireless module. The SIM900A is a complete Dual-Band GSM/GPR solution in a SMT module which can be embedded in the customer's applications. Featuring industry standard interface, the SIM 900A delivers GSM/GPRS 900/1800 MHz performance for voice, SMS, data and FAX in a small form factor and with a low power consumption. With a tiny configuration of 24mm x 24mm x 3mm, SIM900A can fit in almost in all space requirements in user applications, especially for slim and compact demand of design.

VI. PRAPOSED SYSTEM

Moisture sensors are initially installed in row format as shown in figure. If the moisture sensor level desired for a a crop is 'X' value. Here 'X' is an arithmetic mean of (1+2+3)/3 value . If so it the situation then motor will energies and relay one(1) will trip and only TP1 that is solenoid 1 (SN1) becomes ON. When entered water increases level of moisture and after some period moisture level approaches near 'X' when moisture level becomes equal to 'X' then motor pump will stop automatically also SN1 and TP1 will 'OFF' and message will display on mobile, this message contains the TP Status and status of the motor.

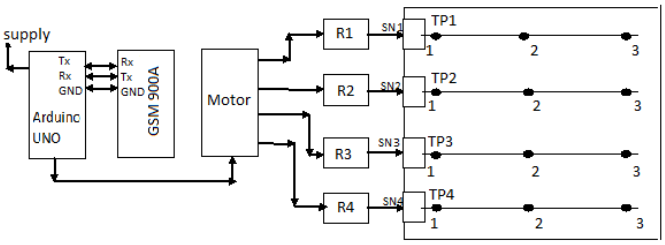

Figure 1. Fig: Proposed System

R1:R2:R3:R4-Realys
TP1:TP2:TP3:TP4 – Taps
TP1:TP2:TP3:TP4- Taps
SN1: SN2: SN3: SN4-Solenoid Valves

Proposed stages are divided into below categories.

A. Frontend

1. Accountability (Web / Mobile Application)

B. Backend

1. Database
2. Whether Prediction module
3. Nutrition management system
4. Water Management System

Accountability-

User need to register their account with this system. System will authenticate the user with valid code. After successful login user get an access to the portal .Portal will showcase the details of the below fields.

1. Motor Status – User will be given an option to ON or OFF the main motor remotely.
2. Water level status – The resource for water irrigation like well, farming pond, bore-well on these cases we can major water level and show it to the user. These levels will be displayed in percentage. We will use ultrasonic sensor to major the water level.
3. Soil Status – In this system we are going to provide soil and moisture content levels. Soil status can be derived by slandered formula.

$\log 1/H = -\log H^+$

Where H = log activity

We also consider current level of NPK

Where N=Nitrogen

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P=Prosperous

K=Potassium

4. Nutrients Status – We recommend a certain amount of nutrients for crop. This information will be provided on the basis of soil examination as well as crop requirements. We are providing this information as considering the disease on the crop. The recommended amount of nutrients will be the requirements per hector.
5. Irrigation control system – By referencing the moisture levels in the soil. The respective water outlets can be activated and deactivated.
6. Whether forecast – Based on the field's longitude and latitude coordinates, accurate whether predictions can be given to the use by the system. On the basis of this information farmer can schedule the water management system.

VII. FUTURE SCOPE

1. We can create mobile application for this system.
2. In the application we can have parameters like PH, Nutrients, water used in liters, motor status etc.
3. We can help farmers by adding weather forecasting , fertilizers information, market availability, market rates for farmers product etc.

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