FLOOD LOSS ANALYSIS WITH SMART SECURITY USING IOT

Abstract- In reality, numerous ranchers confront issue in observing their homesteads. The ranchers have more troubles to screen every one of the homesteads in the meantime. Thus the venture is done to screen the ranches in the field utilizing the idea of IoT (Internet of things). Exactness horticulture is one of the ideal models which can utilize the IoT preferences to enhance the generation productivity and consistency over the agribusiness fields, enhance the nature of the yields, and limit the negative ecological impact. The mix of customary technique with programming advancements like Internet of Things and Wireless Sensor Networks can prompt rural improvement. Temperature level, soil dampness and water level are observed by the readings of these sensors and the pump is changed on to give satisfactory water to the fields. By utilizing the IoT, the advancement time gets diminished and consequently time for observing the ranches. The pump can be turned ON or changed OFF from any piece of the world utilizing the idea IoT (Internet of Things). Temperature sensor sense the warmth in the atmosphere, this proposed framework is arranged to give keen water system and conveying continuous notice in light of data examination and handling without human mediation. It will take proactive and preventive activities to limit the misfortunes.

Keywords-Internet of Things (IoT); Cloud Computing (EC2); Sensors; Microcontroller

1. INTRODUCTION

Farming, which is the upstream sustenance delivering part, is, along these lines, needing new and current techniques to guarantee the world's nourishment security. Conventional horticulture was generally done inside a family or a town. Be that as it may, this customary technique is not any more appropriate, in light of the fact that cultivating yields depend to a great extent on the regular encompassing conditions (e.g., climate and water) and a worldwide temperature alteration issues (causing successive dry spells and surges) and harvest malady episodes are troublesome of cultivating profitability. Along these lines, new strategies for cultivating have been concocted to beat this. The blend of conventional strategy with programming advances like Internet of Things and Wireless Sensor Networks can prompt rural improvement. The related Architectures that were proposed by the Authors are: The Cloud based Architecture for IoT Precision horticulture application and it plot the Three layers of the proposed design [1]. A New farming innovation in view of IoT Association with distributed computing. Here Li-Fi innovation was presented for settled zone structure topology for the better performance [2], Agriculture Production framework has based on the long-standing want of rancher to guarantee their territory stay beneficial into the future utilizing IoT Technology and actualized it as GUI Visualization software [3], Improving Prevention and control abilities of the verdure scourge illness guaranteeing the quality and wellbeing of agrarian products [4]. The Semantically upgraded advanced horticulture utilize case Phenonet worked with the open IoT Platform [5]. In Drip Irrigation control System equipment and programming is intended for uniform use of water specifically to the plant root zone to keep up soil dampness inside the range for good plant development without inordinate water loss [6]. An associated cultivate in view of IoT framework for keen cultivating framework to give web availability to the sensors and controllers of the associated farm [8], A2S which is outlined and actualized to acknowledge mechanized agribusiness [9], Developed the Machine transformation from a customary water system framework to an electronically controllable framework for singular control of water system sprinklers and figured the route of the water system framework that was persistently observed by a differential GPS and remotely exchanged information to a base station for website particular water system control [10].

Numerous Embedded frameworks have significantly unique plans as indicated by their capacities and utilities. In this work Design, organized particular outline idea is embraced, and the framework is mostly made out of a solitary microcontroller LCD, GSM or GPRS. Dry run sensor, water pump so the microcontroller is situated at the focal point of the square graph shapes the control unit of the whole work is inserted inside the microcontroller is a program that causes the microcontroller to act in view of the data sources gave Fig: 1 Shows piece chart of work process. In this paper 1) Water is provided by deciding if the dirt is wet or dry which brings about no wastage of water. 2) Crop development examination is finished by which proper advances are taken or performed which brings about better yield. 3) Provides better security for the harvests. 4) Evidence is gathered as far as product misfortune or general misfortune.

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1.1. Block Diagram

Fig 1: Block diagram of Work Flow

Amazon webserver (AWS) gives on-request figuring assets and administrations in the cloud. You can run a server on AWS that you can sign on to, arrange, secure, and run similarly as you would a server that is sitting before you. Distributed computing is a cloud administrations stage gives quick access to adaptable and ease IT assets. With distributed computing, you don't have to make extensive forthright interests in equipment and invest a great deal of energy in the truly difficult work of dealing with that equipment Cloud processing gives a basic method to get to servers, stockpiling, databases and a wide arrangement of use benefits over the Internet A Cloud administrations stage, for example, Amazon Web Services claims and keeps up the system associated equipment required for these application administrations which can be gotten to utilizing web application.

EC2 gives adaptable processing limit in the Amazon Web Services cloud we can utilize Amazon EC-2 to dispatch the same number of or as couple of virtual servers as we require, design security and organizing, and oversee capacity. Convention utilized is Transport Control convention whatever information originating from equipment TCP will get it and transfer it on site page General Packet Radio Services (GPRS) is a bundle based remote correspondence benefit that guarantees ceaseless association with the Internet for cell phone and PC clients. GPRS will enable you to exchange information over cell systems.

Table 1: Used Sensors

<table>
<thead>
<tr>
<th>Sensors</th>
<th>Models</th>
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<tbody>
<tr>
<td>Temperature</td>
<td>LM35</td>
</tr>
<tr>
<td>Soil Moisture</td>
<td>SEN0114</td>
</tr>
<tr>
<td>Rain Analysis</td>
<td>YL-83</td>
</tr>
<tr>
<td>Dryrun</td>
<td>FTE45</td>
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<tr>
<td>Ultrasonic</td>
<td>HC-SR04</td>
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2. METHODOLOGY

A sample module will be urbanized for the work. It include a sample PCB’s board for all interface just like the above shown diagram. All PCB will be organized with jumper supports. Microcontroller which controls all external peripheral devices ACLD is used for display purpose. The Temperature Sensors are used to detect the temperature of the surrounding. Soil moisture sensor is placed in the soil it will check the soil condition if the soil is dry then through relay the water pump will automatically switched on and off. Dryrun sensor will be placed at the end of the pipe it will check flow of water in the pipe.
Rain analysis will update the Rain condition. Ultrasonic pump will detect the growth of the crop. Microcontroller will sends an alert SMS to farmer through GSM and also it will update on server through GPRS.

The Workflow of the algorithm will be in the following steps.

Microcontroller which controls all external peripheral devices. It is accountable for taking the data from the different sensors attached to it and the Microcontroller used here is Renesas Microcontroller. It is Ultra low power consumption, high speed (41MIPS), high accuracy, industrial oriented microcontroller and Rigidbody.IC Name-R5F100LEA Renesas Development or kit which contains three sections Power Section, Control section, Communication Section.

ALCD is used for Display Purpose which is a flat panel display, we are using 16*2 LC and at one time total 32 characters are going to print. It displays Temperature, Soil condition, Rain State, Crop Growth, Losses

Temperature sensor used is LM35 that will detect the environmental temperature and displays it on the LCD

Soil dampness sensor is placed in the soil, it will check the soil condition. When the value is One then Land Dry messages is displayed on LCD and through relay water pump is switched on automatically and when the value is Zero then through relay the water pump will automatically switched off and Land wet message is displayed on LCD

Dryrun Sensor will be placed at the end of the pipe when the water pump is on. Dryrun condition will be checked for 5 seconds and if the pipe is dry its displays as Dryrun on LCD and even if after 5 seconds there is no flow of water through pipe then water flow message will be displayed on LCD, which means water pump is on and there is no water flow through pipe. IR Sensor will Sense the Movement, it is placed in front of the pump. Initially IR value will be Zero and if the pump is stolen then IR value will be One and a "Pump Theft" alert signal is sent to farmer through GSM and counted as loss.

Rain Analysis will update the rain condition, whether it is Low, High or Medium. When the value is Zero it is considered as Low, if the value is One it is Medium and if the value is Two it is high. if it is high it results in flood then it is counted as loss. Ultrasonic Sensor will detect the growth of the Crop, Initially growth value will be zero which results in no growth of crop and when values becomes one its states high crop growth and if there is low crop growth then it is counted as loss. When Switch button is pressed From Hardware all the data is collected by Microcontroller and it is stored on the Amazon Cloud Server (EC2). TCP will receive the data continuously from the hardware and it will upload to the server.

That Data contains Time, Date, Temperature, Soil State, Rain, Crop Growth, Motor, Flood, and Loss Points. And we can view the data, clear the data or if we want we can download the data.

Data which is displayed on the LCD is stored on the cloud server. The Result contains at particular time and date the present temperature of the environment, soil state whether wet or dry, rain condition high or low or medium, crop growth low or high, motor on or off, flood occur or normal so if any loss is there then loss points will be added and these data will be stored. These data is collected as evidence so if any loss occurs then it would be helpful to the farmer in terms of claiming

3. RESULTS AND DISCUSSION

In this work hardware and software is designed for better crop growth and security. Now heat Sensor is used to detect the environmental temperature the main aim is controlling the water pump automatically based on the soil state. With the assistance of soil dampness sensor through relay water pump is switched on when the soil is dry and switched off automatically when the soil is wet for good plant growth without excessive water loss, erosion and the Crop growth will be effective. Dryrun Sensor will be placed at the end of the pipe and if there is no flow of water dryrun sensor will detect that there is no stream of water in pipe. Fig :2 which shows the relation between soil moisture and water pump. Initially soil moisture will be zero so water pump is off and when the value reaches to one then water pump is switched on automatically through relay. Rain Analysis sensor checks the rain condition whether it is Low, high or Medium. Fig :3 shows the relation between rainfall and dampness, when the rain percentage is below 25% then it is considered as low, if the percentage is above 25 and below 35% it states Rain is medium and if the rain is above 35 percent it states as High, so the heavy rain leads to loss.
Crop growth analysis is done by which appropriate steps are performed which results in better crop growth. Here Ultrasonic Sensor is used to detect growth of the crop Fig :4 Shows the relation between crop and its growth initially there is no growth of the crop and when the value reaches one then growth will be high, if there is no growth in crop it will leads to loss. it provides better security like, evidence is collected in terms of crop loss or loss i.e. for every loss 5 points will be added, the reasons behind the loss like if the rain is heavy it results in floods, if the water pump is stolen a signal is passed to farmer through GSM which results in loss and if there is no growth in crop it also results to loss if these type of loss occurs data is collected as evidence. So that it would be helpful to the farmer in terms of claiming. Fig: 5 shows the relation between the total loss and the claim percentage, for pump theft loss he can claim upto 20%, in terms of crop growth loss he can claim upto 40%, due to heavy rain loss he can claim upto 60%
After all the process When Switch button is pressed the data which is processed is shown on the LCD. This data is stored on the cloud server by the Microcontroller and we can access this data from the cloud server. And the protocol used is TCP protocol, The TCP will receive all the data continuously from the hardware and it will upload to the server that particular data can be viewed, cleared and if we want we can download.
Considering the previous work, which focused on only one of these things like saving water, security and concentrating on crop growth, which is not efficient in the agricultural field. In this paper the focus is on water saving, security in terms of loss, crop growth in case if loss is occurred the farmer can get help by claiming. So which is more effective than concentrating only one factor like in previous work.

4. CONCLUSION
The present work is outlined utilizing organized displaying and can give the coveted outcomes, It can be effectively actualized as an ongoing framework with specific adjustments. Science is finding or making real leap forward in different fields and thus innovation continues changing now and again, to make the framework material for the ongoing reason segments with more noteworthy range should be executed.

5. REFERENCES
[1] Ahmad,Kumar Yelmarthi “Design and implementation of cloud based IoT for scheme Based Precision Agriculture”,IEEE 2016