PROJECT SCOPE

ON

SMART AGRICULTURE SYSTEM BASED ON IoT

The internet of things describes the network of physical objects that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet. IoT applications are prebuilt software-as-a-service applications that can analyze and present captured IoT sensor data to business users via dashboards. The ability of IoT is to provide sensor information as well as enable device to device communication.

Smart Agriculture System uses this IoT technology to bring ease in farming methods. Farmers go through many problems while farming because they have no idea about the weather conditions. They are not priorly known if there will be rains or not or is it going to be sunny all day. Hence problems like over flooding can occur which will degrade the quality of soil by decreasing the required nutrients further leading to reduction in production of crops. On large scale such problems can affect our economy and may lead to some similar starting stages of famine.

This project will not only solve our weather condition problems but also let us know about soil conditions. Depending upon the soil moisture, humidity and temperature, the famer can turn their motors on or off. Turning the motor on and off will also be operated using the web application. This means the farmer can operate on the web app and take care of their fields by tracking the soil conditions and also predicting the weather conditions of their own region.

The project is built using cloud IoT platform and Node -RED. An API is generated which helps in communication of the IoT generated device and the web app made by Node-RED. The UI made makes the device user friendly. This project is just giving basic information of soil like its temperature, moisture and humidity including the weather conditions and all this information and the control over the motors is on the fingertips of the farmers.

To improve the project the sensors used should be incremented. Sensors that can sense the capacity of soil to absorb water and to let us know information about the amount of chemical composition and nutrients of the soil can improve the condition of degraded soils also. Another improvement that can be made is to operate the pesticides, insecticides, irrigation and the fertilization process also handy .

This project has reduced the labour work of farmers and also improved the management of agricultural system. But one of the major drawback is availability of Smart phones and awareness of such IoT systems among farmers and also education.

The major challenges about this project is to bring the actual practical application and also make the app friendly enough to operate not just on fingertips but on the very tip of tongue, that is it should be made to operate on the voices and a camera which can act like an eye on field can also be added to capture and send photos of the farms with the other required data.

CASE STUDY ON INDIRA GANDHI CANAL

Excessive irrigation also causes problem of water logging as has happened in Indira Gandhi Canal area in Rajasthan. Soils and ground level of Indira Gandhi Canal area is very sensitive from the angle of irrigation as maximum soil there has bold granules and at a little depth below the surface, there are hard rocks of calcium carbonate which do not allow excess water to infiltrate underground but keeps it filled above.

Hence, the problem of waterlogging occurs there. Due to maximum dampness in Naurangdesar, Silvana, Lakhuwali and other areas near Indira Gandhi Main Canal, agriculture activity has almost completely stopped. Pilibanga and Badopal have also similar problem. Thus, 44,625 hectare land in the north of the canal has become waterlogged.

Excessive And Irregular Irrigation Has The Following Effects

Increase in Saline and Alkaline Elements in Soil or Increase in Salinity
Problem of Water logging
Reduction in Temperature of Soil

Such problems can be solved if IoT is brought into daily life applications and this can also be a forward step to bring modernization and automation in practical world.

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