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| **Project Title** | **Smart Irrigation and Fertilization System for Precision Agriculture using Internet of Things and Cloud Infrastructure** |
| **Funding Department** | Council of Scientific and Industrial Research |
| **Project Duration** | 36 Months |
| **Project Cost** | Rs. 24.9 Lakhs |
| **Project Started in** | April-18 |
| **Project Expected end in** | Mar-21 |
| **Abstract** | The proposed project aims to find out strategic and conceptual methods for minimal usage of water for irrigating the fields and further intends to design the framework in such a manner that least amount of fertilizers are used for plant’s growth. The entire concept aims at incorporating latest trends and techniques of modern day. The proposed system would make use of agricultural sensors for observing the data. Furthermore, the data would be uploaded on cloud server for enhancing the flexibility of data, disaster recovery in case of system failure and to cater the needs of accessibility of data from any location. During the recent years’ researchers have been exploring the field attributes for clearly understanding the current status and behavior of the fields. According to the observations, future visions for work plan can be charted out by minimal usage of natural and bio-chemical resources. The approach for designing the framework is also to upload the data on to cloud servers to keep a repository of observations and also to be competent enough to access the field information from any place. |
| **Objective** | 1. To study the existing techniques for irrigation and fertilization used by farmers in Punjab 2. To propose an IoT-based smart irrigation and fertilization framework for optimizing the use of water and fertilizers in agriculture. 3. To prepare a test bed for data collection on server with the help of agricultural sensors. 4. To upload the observations observed by sensors onto cloud server for future reference. 5. To develop a Web/ Mobile interface, data analytics system and to perform decision making for end users and farmers. 6. To validate the proposed smart irrigation and fertilization framework. |
| **Project Expected Outcomes** | * IoT-based smart irrigation and fertilization system to optimize the use of water and fertilizer in agriculture. * A cloud-based data analytics system for decision making. * A mobile/web-based based application as an interface to end-user for command and control based on the decision taken by data analytics system. |
| **Work done till date** | * IoT framework for the irrigation to fetch the readings from the environment and the soil is developed. Two different frameworks are developed using Raspberry and Waspmote of the Libelium. * A website named as smartfasal.in is developed for the better experience of the project. It has all the content related to the project such as research articles and hardware and software equipment used in the project. * The observed readings are uploaded to the cloud servers of the smartfasal.in (ftp://ftp.smartfasal.in/) and the thingspeak ([https://thingspeak.com/ channels/863137](https://thingspeak.com/%20channels/863137)). GUI based charts are created on the thingspeak and [http://smartfasal.herokuapp.com](http://smartfasal.herokuapp.com/) depicting the performance of the model. * Four publications are submitted/accepted in the international conference from the proposed scheme. |