

Satellite Based Agricultural Data Monitoring and Weather Podcasting System

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ABSTRACT

The applications of satellite imagination are terribly numerous and most of the image sensors are designed for specific functions, therefore, for a few applications they're incomplete whereas for a few they're either redundant or complementary. for instance, the data contained in multispectral datasets provides a valuable basis for environmental studies whereas the low spatial resolution characteristics of those datasets scale back their performance in several applications. knowledge Fusion (DF) could be a formal framework during which the suggests that and tools for the alliance of information originating from totally different sources are summarized. It aims at getting data of increased quality wherever the precise definition of the term "quality" depends upon the applying of united datasets. The satellite instruments offer a large variety of numerous datasets and thus it's vital to use these datasets properly in order that their application avenue may be extended. These days scientists are paying special attention on Moderate Resolution Imaging Spectro-radiometer (MODIS) as a result of it is temporal similarly as spectral capabilities. Therefore, during this project, our main concern is back-geared towards enhancing the employment of MODIS image that is restricted by the spatial resolution of non- inheritable pictures. Consequently, fusion of high-resolution satellite image might enhance MODIS capability.

Keywords- Satellite, API, Agro API, DF, MODIS, etc.

I. INTRODUCTION

Our aim is to extend agricultural productivity, advance agriculture practices thought to be enforced which might be accomplished by correct agriculture/crop watching. For this purpose, we tend to area unit attending to develop the system which might be employed by farmers. The system is predicated on the analysis of multi-temporal satellite knowledge and composed of principally 2 modules particularly "Classification" and "Crop Monitoring". In classification module, the situation of greenness/vegetation may be known, and also the agricultural space is segregated from different land cowl categories. The Crop watching module is predicated on Normalized distinction Vegetation Index (NDVI) that may be a live of plant/crop's "greenness" on the premise of photosynthetic [chemical change], chemical action process or pigment content within the plant and thus it helps in distinctive the crop health. For crop health watching, 2 choices area unit offered, one is general date wise and another is year wise. In general date wise choice, the season wise have an effect on on the crop health may be monitored and also the alterations occurring in crop health in a very specific fundamental measure may be determined. Through year wise choice, beside vegetative state (healthy/normal/weak) estimation for all the various years, the year wise fluctuations between the chosen years within the physical conditions of a vegetation may also be known.

II. RELATED WORK

Way back in 1969, a practicableness study to observe root plant disease in coconut plantations in elements of Kerala was conducted, conjointly by ISRO, National Aeronautics and Space Administration and IARI. Colour infrared (CIR) images, collected employing a Hasselblad camera on-board an eggbeater, were wont to observe the coconut root plant disease affected plants (Dakshinamurti et al., 1971). Since then, several experiments/projects/programmes are conducted to explore the role of remote sensing in agriculture, a number of that has resulted in national programmes. Initially, aerial CIR pictures were used for crop inventory in Anantapur District of province and Patiala District of geographical region underneath the ISRO and ICAR joint project, referred to as Agricultural Resource Inventory and Survey Experiment (ARISE) (Dhanju & Shankaranarayana, 1978 and Sahai et al., 1977). Watching the crops as well as their health, developing techniques for machine process of remote sensing information was the world of attention in period of time of development that was incontestable in a very study of paddy and sugarcane crops in Mandya district of Karnataka (Sahai et al., 1977). CIR and multi-band aerial images collected in numerous season employing a 2-seater trainer Pushpak craft were wont to establish crops, conversion of multiband black & white images and pc else process were tried to be told the utilization of digital information. blight affected sugarcane crops were additionally known in elements of Mandya victimisation CIR pictures (Parihar et al., 1977). the primary time, Dadhwal & Parihar (1985) used

satellite information of Landsat MSS and digital image analysis for wheat land area estimation in Karnal district of Haryana and enlarged the applying to state-level estimates by introducing a phase sampling approach (Dadhwal et al., 1987). With the launching of IRS-1A satellite, in 1988, it became doable to come up with crop estimates, operationally, that light-emitting diode to the formulation of national level project referred to as Crop land area and Production Estimation (CAPE), underneath that district-level crop space and production estimation was disbursed for major crops like rice, wheat, cotton, groundnut, rabi sorghum and oilseed & mustard (Manjunath et al., 2000 and Dadhwal & Ray, 2000). Dadhwal et al. (2002) have provided a close review of remote sensing-based crop land use/land cover mapping, soil resources mapping, irrigation management, exactitude farming, cropping system analysis, farming development, potential fishing zone statement, etc.

III. METHODOLOGY

The proposed system allows user to monitor weather and soil health through their mobile and web based dashboard from anywhere, this system monitors data with the help of various Data Visualization technologies like gauges, charts, histogram, etc.

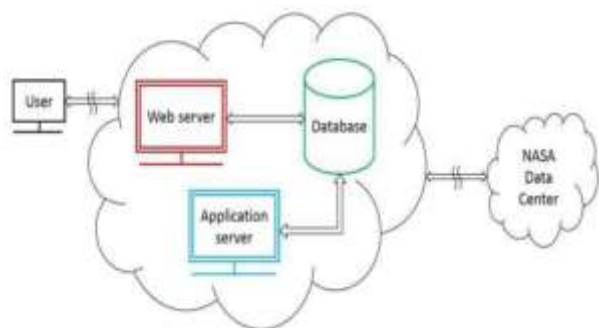


Fig. 1 : system architecture

IV. DASHBOARD

Dashboard may be a visual service that helps you to watch your field states over the year. It covers nearly any territory wherever agricultural activities square measure doable. The service relies on the Openweather genus Apis that operate with satellite representational process and weather knowledge at the side of advanced machine learning technologies.

Wide range of vegetation indices like NDVI, EVI, DSWI, NDWI, NRI, etc. helps you to determine anomalies in your fields and set up additional actions, and with a historical NDVI chart you'll analyze the changes within the level of vegetation in your field through the seasons

Accurate and generous weather knowledge for your fields includes current state of weather, soil, weather alerts; weather forecasts with hourly (2 days) and daily granulation (8 days);

resent temperature, precipitation, soil temperature and moisture; accumulated temperature and precipitation.

1. API To satellite pictures for the crop

Data- NDVI, EVI, EVI2, NRI, DSWI, NDWI square measure the foremost common indicators for assessing vegetation progress over time.

2. API to weather for the crops

- Current Weather
- Forecast for five days ahead with 3-hour step
- Historical weather
- Data sets embody air temperature, humidity, wind speed and different vital weather parameters

3. API to special parameters for agriculture

- Accumulated temperature and precipitation is crucial to form a right call depends on a threshold setting. Temperature amount index calculated because the add of daily temperatures. wetness amount index expressed because the add of daily precipitation
- Soil temperature and wetness square measure essential indices that permit your client to regulate irrigation work and forestall crop roots harm.

V. IMPLEMENTATION AND RESULT

Crop monitoring system manages, visualizes and analysis the spatial SPI, TCI and VCI data in simple and easy way for farmers, stakeholders and policy makers for better understanding of agricultural situations during kharif and rabi season. The interface contains main map, information and legend panel. Complete system is implemented with IoT Technology, and it is live and online, it allows user to monitor their field from anywhere for the specific defined geographical co-ordinates. Working of Trigger Mechanism, when the user sets any condition for example- If the temperature is greater than 34°C then send me an message or email. Whenever, the temperature triggers the condition then server will immediately send a notification or message or email to user. User can generate weather report in PDF format as well as Complete data report. Crop monitoring system manages, visualizes and analysis the spatial SPI, TCI and VCI data in simple and easy way for farmers, stakeholders and policy makers for better understanding of agricultural situations during kharif and rabi season. The interface contains main map, information and legend panel. Complete system is implemented with IoT Technology, and it is live and online, it allows user to monitor their field from

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DASHBOARD IMAGES-



Fig. 2: Sattellite Image of crop



Fig. 3: Weather Data of crop



Fig. 4: Special Parameters for crop

VI. CONCLUSION

The use of satellite based mostly remote sensing has proved itself as a robust and unbiased data system at regular intervals of your time. whereas agricultural scientists have shown some interest in developing its usage, there's still an extended thanks to go, because it is just the agricultural scientists WHO will clearly outline what data is really required. Besides, they ought to integrate the remotely detected data system with their agricultural data system to derive optimum usage, timely recovery of degraded land and refrain from unsustainable activities by use of alternative advanced technologies to their profit and to alter increasing productivity through alternate farming system.

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