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Satellite Based Agro- Advisory Services

B Dinesh
B.Sc. Student, Lovely Professional University

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Introduction:

Agricultural meteorology must used in agricultural planning and in the utilisation of agricultural technologies. Agricultural weather and climate data systems are required to hasten the production of goods, analyses, and forecasts that influence agricultural cropping and management decisions, irrigation scheduling, commodity trading, markets, and preparedness for calamities.

By using remote sensing method to evaluate crop condition and estimate yields:

Utilizing the remote sensing approach, crop condition evaluated, and yield estimates made. The use of remote sensing data to estimate crop acreage has progressed to a point almost operational. Studies conducted for predicting the area under various crops in numerous countries show a degree of accuracy close to 90%. Nations use remote sensing data for crop yield modelling, crop stress monitoring, and production forecasting for specific crops. Numerous elements affect yield, including crop genotype, soil characteristics, cultural practises used, weather patterns, and the effects of diseases and pests. Ascertain the combined effects of several elements that influence crop development and crop production, numerous methods have used. Cover some of the characteristics, several yield models have constructed using data from various type of satellites. [HP Das 2004]. The Utilizing the NDVI parameter to predict agricultural yields is a particular application on the overarching idea. There is a correlation between the seasonal NDVI levels.as reported crop yields in semi-arid zones. Models for simulating crop growth have used to accurately forecast yields of crops in the field. However, there input specifications that are depending on the crop variety, soil properties, and management techniques their relevance to local studies. incorporating metrics obtained from growth model applied to remotely sensed data gives spatial integrity and near-real-time simulations of crop growth that are "calibrated" in real time. Data collected remotely a reutilised in simulations [Pettorelli, N 2005]

Pest and disease tracking using satellite data

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Numerous elements, including intensive farming, monoculture, shifting weather patterns, and the excessive use of pesticides, have led to crop diseases and pest outbreaks that frequently result in significant crop losses. Enhancing grain output and remote agriculture by reducing these losses Sensing technology hasshown to be particularly helpful in routinely monitoring big areas. The densities of insect populations and their natural adversaries are influence by weather factors as temperature, humidity, daylight hours, and wind. The type of cloud is one of the weather variables that can remotelysense. [Nesreen, M 2020]. This provided a hint to the area that was visible from a satellite's vantage point. Understand the significance of plant protection in agricultural production programmes, one must first have a basic understanding of crop losses. Losses may result from biotic factors like pests, illnesses, and weeds as well as abiotic factors such as hailstorms, cyclones, floods, and drought. Pest damage may result in quantitative (total yield decline) or qualitative (colour shift), and an unpleasant smell. the differences in crop status assessments between regions, the ties between the Centre and States that handle humanitarian efforts and the launch of a crop insurance programme calls for an independent timely information system to provide warning and show the level of as well as to calculate the loss. [Gao, D 2020].

Remote sensing used to keep track on natural disasters

While airborne remotely sensed data have used for a long time, satellite-based remote sensing data regarded as a strong tool for tracking changes in the Earth's environment and taking prompt action because of its constant availability and ability to view broad areas. By providing an early warning system, remote sensing satellite data helps to reduce losses due to natural disasters, such as the death of people, animals, and crops. [Jeyaseelan 2003].

Remote Sensing of soil moisture

Given the close physical correlation between the microwave response and soil moisture as well as the capacity of microwaves to penetrate clouds, precipitation, and herbaceous vegetation, microwave sensors are the best soil moisture sensors. The main benefit of active microwave sensors is the ability to get excellent spatial resolution even at satellite altitudes. Only surface layers up to 10 cm thick can receive estimations of soil moisture from microwave sensors. In comparison to the 1-2 m root zone of many tropical field crops, this depth is too shallow. When the surface soil moisture estimation uses the water content in the top 10 cm of the surface layer, the moisture content can compute within reasonable bounds and with the least amount of error. [WANG 2009].

Remote sensing's estimation of rainfall

Although rainfall estimated by satellites is unlikely to be more accurate than rainfall collected by traditional rain gauges, it is nonetheless valuable to close spatial and temporal gaps in ground reporting. A method for creating an indicative drought map based on NOAA AVHRR-derived rainfall estimation at the seedling stage of crop growth demonstrated by Nageswara Rao and Rao.

FASAL

When identifying crops using remote sensing data, the crop must have grown before using the data. However, crop forecasting at the sowing stage would necessitate the utilisation of weather data as well as knowledge of the economic factors influencing the farmer's reaction. The "Forecasting Agricultural output using Space, Agrometeorological and Land based observations (FASAL)" idea was develop considering these factors. Prior to crop sowing activities, FASAL seeks to forecast the area and production using econometric models. Forecasting crop acreage and production in unirrigated areas involves using data on the quantity and distribution of rainfall. Crop area counting, crop condition evaluation, and production forecasts all depend on remote sensing data, both optical and microwave. The crop is being observe throughout its growing season using data from temporal remote sensing. Create the crop growth monitoring system, surface and satellite measurements of vegetation indices and weather parameters will be use. [Parihar j.s vol 6411].

Components of FASAL

The following exercises have used to develop, evaluate, and implement the FASAL concept's components:

- National Kharif rice production forecasting using Radar sat SAR data
- National wheat and winter potato production forecasting using IRS AWIFS data
- District level FASAL implementation in the state of Odisha. Three in-season predictions produced. This successfully demonstrates the FASAL concept of using multi-source data and approaches.

Conclusion:

Remote sensing based on satellite technology has consistently shown itself to be a reliable and objective information system. There is still a long way to go because only agricultural scientists can properly identify what information needed. Agricultural scientists have showed interest in developing its usage, but there is still a long way to go. They should also integrate the remotely sensed information system with their agricultural information system to get the most out of it, to recover degraded land quickly, to avoid unsustainable activities, to use other advanced technologies to their advantage, to increase productivity through alternative farming systems, and to avoid unsustainable activities.

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