JUST AGRICULTURE
multidisciplinary e-Newsletter

Application of Remote Sensing in Agriculture

Pallavi Priya, Raman Kumar
BFIT, Dehradhun
Email. Id- priyapallavi373@gmail.com
ARTICLE ID:082

Introduction

Remote sensing is defined as the art and science of gathering information about objects or areas from a distance without having physical contact with objects area being investigated. The principal behind remote sensing is the use of electromagnetic spectrum (visible, infrared and microwaves) for assessing the earth's features. The typical responses of the targets of these wavelength regions are different, so that they used for distinguishing the vegetation, bare soil, water and other similar features. They are generally two types of remote sensing are Passive remote sensing and active remote sensing. Passive remote sensing system which measure energy that is naturally available . For example: Sun, this can only take during the time when the sun is illuminating the earth. Active provide their own energy source for illumination. The sensor emits radiation which is directed towards the target to be investigated. The radiation reflected from that target is detected and measured by the sensor. They obtain measurements anytime, regardless of the time of day or season. For example: Laser, Radar.

Role of Remote Sensing in Agriculture

Agriculture resources are important renewable dynamic natural resources. In India, agriculture sector alone sustain the livelihood around 70 percent of the population and contributes nearly 35 percent of the net national product. Increasing agriculture productivity has been the main concern since scope for increasing area under agriculture is rather limited. This demands judicious and optimal management of both land and water resources. During the last two decades, remote sensing techniques are applied to explore agriculture application such as crop growth monitoring comprehensive and reliable information on land use\cover, forest area, soils, geological information, extent of wastelands, agriculture crops, water resources both surface and underground and hazard\natural calamities like drought and flood

JUST AGRICULTURE
multidisciplinary e-Newsletter

is required. Season-wise information on crops, their acreage, vigour and production enables the country to adopt suitable measures to meet shortages, if any, and implement proper support and procurement policies.

- Ground bases: Infrared thermometer, spectral radiometer, Pilot-Balloons and radars.
- Air Bases: Aircraft air based remote sensing tools.
- Satellite based: The digital image processing, using powerful computers, is the key tool for analysing and interpretation of remotely sensed data.

Since the ground based and air based platforms are very costly and have limited use, space based satellite technology has become handy for wider application of remote sensing techniques.

Remote Sensing technology provides many advantages over the traditional method in agriculture resources survey. The advantages include capability of synoptic view, potential for fast survey, capability of repetitive coverage to detect the changes, low cost involvement, higher accuracy and use of hyperspectral data for increasing information. As mentioned there are many application of remote sensing in the agriculture sectors. Below given the summary of these applications :

Crop Production Forecasting:

Remote sensing is used to forecast the expected crop production and yield over a given area and determine how much of the crop will be harvested under specific conditions. Researchers can be able to predict the quantity of crop in a given farmland over a given period.

Assessment of Crop Damage and Crop Progress:

In the event of crop damage or crop progress, remote sensing technology can be used to penetrate the farmland and determine exactly how much of a given crop has been damaged and the progress of the remaining crop in the farm.

Crop Identification:

Remote sensing has played an important role in crop identification especially in cases where the crop under observation shows some mysterious characteristics. The crop data collected will be taken to labs where various aspects of crop including the crop culture are studied.

JUST AGRICULTURE
multidisciplinary e-Newsletter

Crop Acreage Estimation:

Remote sensing has also played a very important role in the estimation of the farmland on which a crop has been planted. This is usually a cumbersome procedure if it is carried out manually of the vast sizes of the land being estimated.

Crop yield Modelling and Estimation:

Remote sensing also allows farmers and experts to predict the expected crop yield from a given farmland by estimating the quality of the crop and the extent of the farmland. This is then used to determine the overall expected yield of the crop.

Identification of Pests and Disease Infestation:

Remote sensing technology a significant role in identification of pests in farmland and gives data on the right pests control mechanism to get rid of the pests and diseases on the farm.

Soil Mapping:

Soil mapping is one most important uses of remote sensing, through soil mapping, farmers are able to tell which soil are ideal for which crops and which soil require irrigation and which one do not. This information helps in precision agriculture.

Water Resources Mapping:

Remote sensing is instrumental in the mapping of water resources that can be used for agriculture over a given farmland. Through remote sensing, farmers can tell where water resources are available for use over a given land and whether the resources are adequate.

Monitoring of Droughts:

Remote sensing technology is used to monitor the weather pattern of given area. The technology also monitors drought pattern area too. The information can be used to predict the rainfall patterns of an area and also tell the time difference between the current rainfall and the next rainfall which helps track of the drought.

Conclusion

With increasing population pressure throughout the world and the need for increased agriculture production, there is a definite need for improved management of the world's

JUST AGRICULTURE
multidisciplinary e-Newsletter

agriculture resources. To make this happen, it is first necessary to obtain reliable data on not only the types of resources, but also the quality, quantity and location of the resources. Satellite-or aerial-based RS technologies will become important tools in improving the present system of agriculture and generating agricultural and natural resources data. Agriculture surveys are presently conducted throughout the world in order to gather empirical information on crop, rangeland, livestock and other agriculture resources. Such information is critical for effective management of depleting and scarce resources.