Solution:

GIS/Remote Sensing for Crop type mapping and assessment of crop health

Submitter: (ICRISAT)

Solution Overview

What is it, and what problem does it solve? Brief 2–3 sentence description.

Crop type mapping and crop health assessment are essential components of modern agricultural monitoring. Crop type mapping involves identifying and classifying the various crops grown in a region using satellite imagery, remote sensing, and GIS tools, which helps in understanding cropping patterns and planning agricultural activities.

Key Features & Benefits

Main components and why it is useful? Bullet points summarizing methods, tools, and value added.

The main components of Crop type mapping include the acquisition of time-series hyper-spectral satellite imagery, ground-truthing, building spectral libraries for different crops, image processing, and estimating the area under different crops. The benefits of crop type mapping include improved agricultural planning, as it supports decisions related to crop rotation, yield forecasting, and market supply management. Governments and insurance providers can leverage this data to verify crop insurance claims and manage subsidy programs more effectively.

Where It Works and Where It Can Work

Existing and potential target regions, agroecologies, or farming systems. Include examples if available.

Crop type mapping and crop health assessment have already successfully deployed in a variety of agricultural regions in India with established access to satellite data and digital agriculture infrastructure. This can be expanded to regions where agriculture is critical to livelihoods, but data-driven farming is still emerging. This includes much of Sub-Saharan Africa, South and Southeast Asia. These areas often have high climatic variability and fragmented landholdings, making remote sensing tools valuable for scalable, consistent monitoring. and farming systems worldwide, demonstrating their adaptability across diverse agroecological zones.

Evidence & Impact

What results has it shown? Stats, pilot outcomes, or testimonials.

Crop type mapping is one of the most advanced applications of remote sensing technology, enabling the identification of different crop types across a region. In the Bundelkhand region, village-level crop type mapping has been successfully conducted using high-resolution satellite data with both temporal and spatial detail. This approach allowed for the classification of wheat, mustard, and chickpea crops with an accuracy of approximately 85%. The integration of crop type and health monitoring has significantly reduced the reliance on traditional crop cutting experiments (CCEs), which are typically used to estimate yields for crop insurance.

Scalability & Adoption Support

Why it can be scaled and what's needed to adopt it?

Low-cost, adaptable, partner-ready, etc.

Crop type mapping and crop health assessment technologies are highly scalable due to their reliance on widely available satellite and drone imagery, cloud computing, and advanced machine learning algorithms. These solutions can be adapted to various geographic regions, crop types, and farm sizes, from smallholder farms to large commercial operations. To successfully adopt these technologies, key requirements include access to quality geospatial data, basic technical infrastructure such as internet connectivity, and training or capacity-building for end-users to interpret and apply the insights effectively.

Collaboration with local agricultural extension services, technology providers, and government agencies further facilitates adoption by aligning solutions with local farming practices and policy frameworks.

Partners & Contact Info

Who's involved and how to connect? List of key contact and partners + email / phone.

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