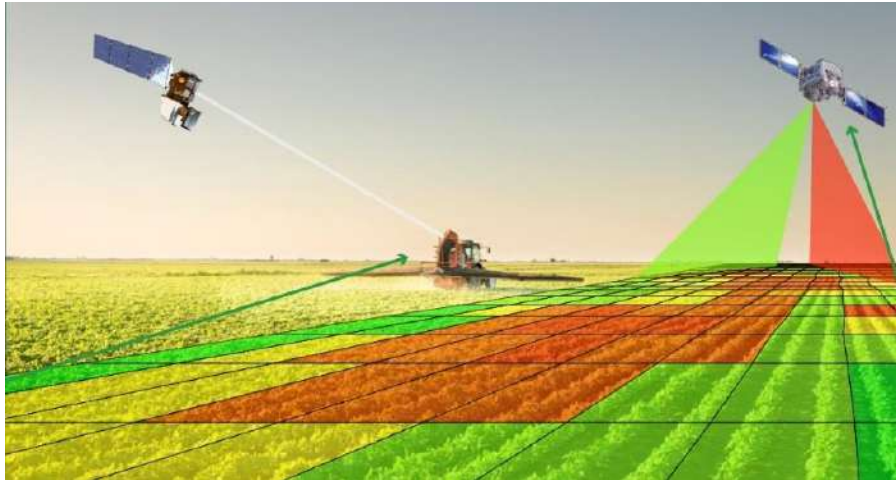


Leveraging Satellites and Remote Sensing for Crop Insurance: PMFBY as a Model for the Global South

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Agriculture in the Global South is increasingly vulnerable to climate-induced risks, necessitating robust mechanisms for financial resilience among farmers. Crop insurance plays a crucial role in safeguarding livelihoods, yet challenges such as delayed claim settlements, inaccurate yield assessments, and high operational costs often hinder its effectiveness. India's Crop Insurance Programme-Pradhan Mantri Fasal Bima Yojana (PMFBY) has pioneered the integration of satellite-based remote sensing technologies to enhance transparency, efficiency, and scalability in crop insurance.

PMFBY has leveraged remote sensing, geographic information systems (GIS), and artificial intelligence (AI) to revolutionize yield estimation and risk assessment. These technologies minimize dependency on traditional, manual crop-cutting experiments (CCEs), which are often resource-intensive and prone to errors. The Department of Agriculture and Farmers Welfare, Government of India has introduced the Yield Estimation System Based on Technology (YES-TECH) for paddy and wheat crops from Kharif 2023. This system, developed through pilot studies conducted by the Mahalanobis National Crop Forecast Centre (MNCFC), integrates satellite-based remote sensing and advanced analytics for improved yield estimation. Under this initiative, 30% weightage has been mandatorily assigned to YES-TECH derived yield, ensuring a more transparent and accurate assessment of crop losses. In Kharif 2023, all implementing states successfully completed claims calculation and payout using YES-TECH without any disputes from stakeholders. This demonstrates the enhanced efficiency and credibility of technology-driven crop insurance mechanisms. PMFBY is mainly implemented on an 'Area Approach' basis, providing comprehensive risk coverage for farmers' crops against all natural disasters from pre-sowing to post-harvest stages at a minimal premium.

Key Advantages of Satellite-Based Crop Insurance

1. *Improved Accuracy in Yield Estimation:* Satellite imagery and Remote Sensing based models enhance objectivity in yield assessments, reducing discrepancies in loss evaluations.
2. *Faster Claim Settlements:* Remote sensing expedites post-disaster damage assessment, enabling quicker compensation disbursement to affected farmers.
3. *Cost-Effectiveness:* Automated monitoring significantly reduces administrative and operational costs, making insurance more affordable and accessible.
4. *Scalability:* The technology-driven approach allows the model to be replicated across diverse agro-climatic regions.
5. *Increased Transparency:* The successful implementation of YES-TECH in claim settlements in Kharif 2023 indicates a more reliable, stakeholder-approved approach to insurance payouts.

The PMFBY model presents a scalable framework that can be adopted across the Global South by integrating remote sensing and GIS tools into national crop insurance programs. Regions facing similar agricultural vulnerabilities can benefit from India's experience in leveraging remote sensing for data-driven decision-making in crop insurance programmes.