

## The Economic Impact of Crop Insurance: Protecting Farmers Against Income Loss under PMFBY

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### Abstract: -

Agriculture in India is highly vulnerable to climate variability, pest outbreaks, and market fluctuations, which threaten farmers' incomes. Crop insurance schemes, such as the Pradhan Mantri Fasal Bima Yojana (PMFBY), provide financial protection against losses, stabilize farm income, and promote investment in modern agricultural practices. This article evaluates the economic impact of crop insurance in India, highlights current challenges, discusses technological innovations for efficient implementation, and outlines future perspectives for strengthening risk management in agriculture.

**Keywords:** Crop insurance, PMFBY, economic impact, risk management, farmers' income, natural disasters etc.

### Introduction:

Agriculture contributes nearly 17–18% of India's GDP and employs more than 50% of the rural population. However, the sector remains highly susceptible to natural disasters such as droughts, floods, and unseasonal rainfall, as well as pest and disease outbreaks. Income instability discourages investment in modern inputs and technologies, reducing productivity and sustainability.

Crop insurance schemes aim to mitigate these risks by providing financial compensation for crop losses. The Pradhan Mantri Fasal Bima Yojana (PMFBY), launched in 2016, offers coverage for pre-sowing to post-harvest losses, low premium rates for farmers, and promotes adoption of modern risk management practices. By reducing income variability, crop insurance contributes to economic stability, enhances credit access, and encourages the use of high-

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yielding and resilient crop varieties.

## Current Challenges in Crop Insurance

### Implementation

1. Awareness and Enrollment Limited awareness among small and marginal farmers about the scheme's benefits, processes, and eligibility reduces coverage rates.
2. Timely Claim Settlement Delays in claim assessment and compensation payment often undermine the scheme's effectiveness in stabilizing farmer income.
3. Premium Affordability and Subsidy Dependence While PMFBY offers subsidized premiums, some farmers still find it unaffordable, particularly for high-value or multi-crop coverage.
4. Crop Damage Assessment Traditional methods of assessing crop loss rely on physical inspections, which are time-consuming, labor-intensive, and prone to error or disputes.
5. Low Adoption Among Marginal Farmers Marginal and tenant farmers often face difficulties in accessing insurance due to lack of land records, bank accounts, or proper documentation.

### Technological Innovations in Crop Insurance

1. Remote Sensing and Satellite Imagery Use of satellites and drones helps

monitor crop health, estimate area coverage, and assess losses accurately and rapidly.

2. Weather-Based Index Insurance Weather-index insurance links payouts to measurable climatic parameters such as rainfall, temperature, or drought indices, reducing assessment time and moral hazard.
3. Mobile Applications and Digital Platforms Digital enrollment, claim submission, and tracking improve efficiency, transparency, and access for farmers in remote areas.
4. Data Analytics and AI Big data analytics and machine learning enable predictive modeling for risk assessment, claim forecasting, and premium determination.
5. Blockchain for Transparency Blockchain technology can ensure transparent, tamper-proof record-keeping of insurance policies, claims, and payments, enhancing trust among farmers.

### Conclusion and Future Perspectives

Crop insurance, particularly PMFBY, plays a vital role in protecting farmers against income loss, stabilizing rural livelihoods, and fostering agricultural growth. However, challenges such as delayed claims, low awareness, and limited adoption among marginal farmers must be addressed to realize its full potential.

## Future strategies include:

1. Enhanced Awareness Campaigns: Targeted training and communication to educate farmers on benefits, processes, and digital tools.
  2. Timely and Efficient Claim Settlement: Leveraging satellite data, drones, and AI to reduce delays and disputes.
  3. Inclusive Coverage: Simplifying processes to cover tenant, marginal, and smallholder farmers.
  4. Integration with Risk Management Tools: Linking insurance with credit, climate-smart practices, and resilient crop varieties.
  5. Policy Support and Innovation: Continuous review of premiums, subsidies, and technological adoption to improve scheme efficiency and sustainability.
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## Conclusion

Crop insurance serves as a critical economic safety net for farmers. Combining technology, awareness, and policy support will enhance its impact, reduce vulnerability, and promote resilient agricultural systems in India.

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