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# AGRICULTURE INSURANCE IN INDIA: POLICIES AND COVERAGE

**KEY WORDS:** Crop Insurance, Agriculture Risk, PMFBY, WBCIS

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**ABSTRACT**

Agricultural insurance is a vital risk-management tool that safeguards farmers against financial losses caused by natural disasters, climate change, and market uncertainties. In India, various schemes, including the Pradhan Mantri Fasal Bima Yojana (PMFBY) and Weather-based Crop Insurance Scheme (WBCIS), have been introduced to mitigate these risks. This study reviews the evolution of agricultural insurance in India, evaluates its effectiveness, and identifies key challenges such as low awareness, delayed claim settlements, and inadequate coverage. The analysis is based on secondary data, including government reports, policy documents, and academic research, with a comparative assessment of different schemes. Findings suggest that while these schemes have improved financial security for farmers, challenges remain. Strengthening technology-driven solutions, improving farmer education, and ensuring timely claim settlements are essential to enhancing their impact. Future policy reforms should focus on making agricultural insurance more inclusive, accessible, and resilient to climate risks.

## INTRODUCTION

Agriculture plays a significant role in India's economy, contributing nearly 18% to the GDP and employing over 50% of the workforce. However, Indian agriculture is highly vulnerable to risks, such as erratic rainfall, droughts, floods, pest attacks, and market fluctuations. Agricultural insurance aims to mitigate these risks by compensating farmers for crop losses, thereby ensuring financial stability and promoting investments in agriculture. The Indian government has introduced various schemes to improve farmers' access to finance and insurance (Kambali & Niyaz, 2021). However, crop insurance adoption remains low, with only approximately 5% of households insuring their crops and 87% not receiving claims (Cariappa et al., 2020). The study revealed that households with larger family sizes, lower social groups, less education, lower standards of living, and poor economic conditions are more likely to be excluded from crop insurance coverage (Cariappa et al., 2020). Despite these challenges, agricultural insurance has shown potential benefits. Households with access to crop insurance have significantly less outstanding debt and experience positive effects on their input costs and crop income (Cariappa et al., 2020). However, the current system faces issues, such as adverse selection due to the relationship between rate-making and expected yields for individual farmers (Skees & Reed, 1986). To address these challenges and improve the effectiveness of agricultural insurance in India, policymakers should consider revenue-based indemnity calculations, strengthen both credit and insurance markets, and focus on developing more tailored farm-specific insurance products (Cariappa et al., 2020; Skees & Reed, 1986). Agricultural insurance in India is a crucial component of the country's efforts to protect farmers against various risks and uncertainties. The sector has experienced significant growth, with a 25% increase in the health insurance business in recent years, primarily driven by the expansion of private health insurance (Gambhir et al., 2019). India's agricultural sector contributes 13.9% to the country's GDP and employs 54.6% of the workforce, highlighting its importance to the national economy (Wagh & Dongre, 2016). Given the sector's vulnerability to various factors such as climate change, crop diseases, and market fluctuations, agricultural insurance plays a vital role in mitigating risks for farmers. A key challenge in agricultural insurance is the assessment of crop damage, particularly in cases of lodging. Remote sensing (RS) techniques have shown promise in this area, although their use remains in the experimental stage. Satellite-based lodging assessment studies are limited and operational applications over large spatial extents remain a significant challenge (Chauhan et al., 2019). The development of quantitative models to estimate lodging severity and map lodging risks using RS data presents opportunities for future research. The implementation of climate-smart agriculture (CSA) strategies can potentially address some of the challenges faced by the agricultural sector, including greenhouse gas emissions and food security concerns. Future developments in CSA are expected to focus on leveraging advanced internet technologies to enhance agricultural data security, optimize cropping patterns, and improve management techniques (Raihan et al., 2024). While progress has been made in agricultural insurance in India, there are still significant challenges to overcome. The integration of new technologies, such as remote sensing and data mining techniques (Kamath et al., 2021), could improve risk assessment and policy implementation. Additionally, addressing issues related to climate change and sustainable agricultural practices will be crucial for the future prospects of agricultural insurance in India. Agriculture insurance in India has evolved significantly over the past few decades, with various schemes being introduced to protect farmers against crop losses due to natural calamities. Agricultural insurance in India has been a crucial policy instrument for protecting farmers against various risks and uncertainties. Despite numerous initiatives, this sector faces significant challenges in its implementation and adoption.

### Review Of Literature

Agricultural insurance plays a crucial role in safeguarding farmers against financial losses caused by unpredictable weather, pests, and market fluctuations. Researchers have extensively studied its effectiveness, challenges, and potential for improvements. This review presents key studies under the following themes.

### Effectiveness Of Agricultural Insurance Schemes

Agricultural insurance schemes in India have shown mixed results in terms of effectiveness. Although they are considered a significant risk management policy, access to these schemes remains a major challenge for the majority of farmers (Singh & Agrawal, 2020). The government has introduced new agricultural schemes every decade, but they often prove inconsistent and ineffective because of operational defects (Singh & Agrawal, 2020). Moreover, Implementation issues at the state level further compounded the problem, leading to the improper operation of current crop insurance schemes (Singh & Agrawal, 2020). Despite these challenges, some studies have shown the positive impact of publicly financed health insurance schemes on health service utilization in India (Prinja et al., 2017). However, the same study found no clear evidence of reduced out-of-pocket expenditures or higher financial risk protection for the enrolled households (Prinja et al., 2017). This

contradiction highlights the complexity of implementing effective insurance schemes. Although agricultural insurance is recognized as an important tool for risk management in India, its effectiveness has been limited by various factors. These include insurance illiteracy, farmers' preferences for relief payments, and implementation issues (Singh & Agrawal, 2020). However, recent innovations, such as weather-based index insurance and revenue insurance, present potential solutions that may improve the effectiveness of these schemes (Santeramo & Ford Ramsey, 2017). Additionally, the introduction of a "satellite-derived crop health index" as an alternative to yield data in insurance models shows promise in enhancing risk transfer in agriculture (Murthy et al., 2022). To improve the effectiveness of agricultural insurance schemes in India, further research and policy-driven experimentation are required to address existing knowledge gaps and implementation challenges (Kadiyala et al., 2014).

**Challenges Faced by Farmers in Insurance Adoption**

Farmers in India face several challenges when adopting agricultural insurance. One of the primary obstacles is the lack of awareness and understanding of insurance products among smallholder farmers (Cole and Xiong 2017). This is further compounded by the limited access to financial services and mobile-based applications, which could otherwise facilitate insurance adoption (Andati et al., 2022). Economic constraints significantly hinder insurance adoption. Many farmers, particularly those with small landholdings, find it difficult to afford insurance premiums (Fragomeli et al. 2024). Additionally, an uncertain legal framework and insufficient training and education about insurance products add to the challenges, further impedeing adoption (Oke et al., 2024). Interestingly, while crop insurance has dominated the agricultural landscape in some regions, such as the Midwest United States, it is not necessarily a barrier to the adoption of conservation practices (Fleckenstein et al., 2020). This suggests that insurance and conservation practices can coexist and play unique roles in farmers' operations. However, in India, the situation may differ because of the country's specific agricultural and socioeconomic contexts. Addressing the challenges of insurance adoption in India requires a multifaceted approach. This includes improving awareness through education and training, enhancing access to financial services, and developing tailored insurance products that meet smallholder farmers' needs. Additionally, leveraging technology, such as blockchain, could potentially improve transparency and trust in the agricultural supply chain, which might indirectly boost insurance adoption (Yadav et al., 2020).

**Farmer Awareness And Participation**

Agriculture insurance in India is recognized as a crucial risk management policy for farmers; however, its accessibility remains a significant challenge for policymakers (Singh & Agrawal, 2020). Despite the government's efforts to introduce new agricultural schemes every decade, these initiatives have been inconsistent and ineffective owing to operational defects (Singh & Agrawal, 2020). Awareness and adoption of climate-smart agricultural technologies (CSAT) among Indian farmers, which can enhance resilience to climate change, is relatively low. Approximately 74% of farmers have low to medium awareness of CSAT, whereas approximately 83% have low to medium adoption rates (Hebsale Mallappa & Pathak, 2023). This low awareness and adoption can be attributed to factors such as limited knowledge of CSAT, high input costs, and youth migration from rural areas (Hebsale Mallappa & Pathak, 2023). Interestingly, a study on farmers' willingness to pay for crop insurance in India revealed that some farmers are willing to pay premiums exceeding the current subsidized rates (Ghosh et al., 2020). Farmers particularly value timely payouts when they incur losses, and are sensitive to coverage periods (Ghosh et al., 2020). This suggests that the low uptake of crop insurance in India may not be primarily due to premium costs, but rather to other factors, such as implementation issues at the state level and farmers' preference for agriculture relief payments (Singh & Agrawal, 2020). To improve farmer participation in agricultural insurance and related schemes, several factors need to be addressed. These include enhancing farmers' education levels; increasing their exposure to agricultural mass media; promoting participation in extension programs; and fostering innovativeness, achievement motivation, risk orientation, and scientific orientation among farmers (Hebsale Mallappa & Pathak, 2023). Additionally, involving farmers in decision-making processes related to the development of climate-smart technologies and ensuring a timely supply of inputs could promote awareness and adoption of such technologies (Hebsale Mallappa & Pathak, 2023).

**Role Of Technology In Agricultural Insurance**

In recent years, agricultural insurance has seen significant technological advancements, playing a crucial role in risk management and farm productivity. The integration of digital platforms, IoT devices, and AI-driven analytics has transformed the way farmers design, implement, and access insurance products (Abbasi et al., 2022; Fox et al., 2021). Mobile digital platforms for farm management have emerged as powerful tools that enable farmers to manage their operations better and interact with insurance providers. These platforms are shaped by social influence, performance expectancy, and effort expectancy, and trust beliefs play a significant role in the continued use post-adoption (Fox et al., 2021). Additionally, technologies such as unmanned aerial vehicles (UAVs), IoT sensors, irrigation automation, and smartphones are becoming mainstream in small-scale farming, offering potential solutions to the challenges faced by smallholder farmers (Dhillon and Moncur, 2023). The combination of blockchain technology with IoT devices has shown promise in creating more transparent and efficient agricultural insurance systems. This integration facilitates the creation of reliable food supply chains, direct markets for farmers, and the improved traceability of agricultural products (Praveen et al. 2021). Furthermore, the use of robotics and drones equipped with AI and machine learning algorithms has revolutionized precision agriculture, providing real-time data and actionable insights that insurance providers can leverage to assess risks and tailor products more accurately (Das, 2024). Technology plays a multifaceted role in the agricultural insurance sector, from improving risk assessments and product designs to enhancing farmer engagement and operational efficiency. As these technologies continue to evolve, they have the potential to make insurance more accessible, affordable, and effective for a broader range of farmers, ultimately contributing to increased food security and sustainable agricultural practices (Abbasi et al. 2022; Kramer et al. 2022; Vyas et al. 2021).

**Lessons From Other Countries**

Agricultural insurance programs have been implemented in various countries, with mixed results. In the European Union, despite recent changes in the Common Agricultural Policy, participation in crop insurance programs remains low, at around 20% (Santeramo and Ramsey, 2017). This contrasts sharply with the United States, where the federal crop insurance program covers the majority of the agricultural land. In developing countries, agricultural insurance can provide significant welfare gains for smallholder farmers, potentially increasing their investments and income by 20-30% (Kshetri, 2021). However, determining farmers' real demand for crop insurance in these contexts is challenging because of the lack of formal financial sector integration and reliance on informal risk mitigation options (Ghosh et al., 2020). Studies in India have shown that farmers value crop insurance under certain conditions, particularly when they

receive timely payouts and have flexibility in their coverage periods. Interestingly, research in Romania has revealed that crop insurance knowledge and risk assessment are key factors influencing insurance adoption, along with cultivated area, trust in the insurer, and crop type (Dragos et al., 2023). In China, farmers' insurance choices depend on the difference between their total costs and earnings, with compensation, subsidies, and premiums playing a crucial role (Sun et al. 2023). A study in rural China found that farmers initially made arbitrary decisions influenced by community pressure but gradually established more rational decision-making mechanisms based on factors such as yield volatility, education, and engagement experience (Wang et al., 2015).

**Objective**

**The Study is based on the following objectives:**

1. **To assess the effectiveness and coverage of crop insurance schemes in India**, focusing on participation and claim settlement.
2. To analyze the evolution of crop insurance schemes in India.

**Methodology**

This study adopts a systematic review approach to analyze the effectiveness, challenges, and future prospects of agricultural insurance policies in India. This methodology involves collecting, evaluating, and synthesizing secondary data from various sources to provide a comprehensive understanding of the subject. Data will be collected from government reports, policy documents, official databases, and published research studies on Pradhan Mantri Fasal Bima Yojana (PMFBY) and Restructured Weather-Based Crop Insurance Scheme (RWBCIS) covering the period from 2016-17 to 2023-24. For the Coconut Palm Insurance Scheme (CPIS) from 2009-10 to 2020-21. A descriptive and analytical research design was used to examine trends in participation rates, claim settlements, and regional variations. Quantitative data such as the number of farmer applications, area insured, sum insured, gross premiums, and claims settled will be analyzed to assess the performance of crop insurance schemes. A comparative analysis across states will help identify disparities in implementation and effectiveness. To understand these challenges and opportunities, a literature review will be conducted on existing studies related to technology adoption, policy gaps, and financial inclusion in crop insurance. Policy recommendations were formulated based on the findings, focusing on expanding coverage, improving claim settlements, and leveraging technology for better risk management.

**Evolution Of Crop Insurance Scheme In India**

The Government of India has long used crop insurance to mitigate farming risks. The first attempt was in 1915 by the Mysore state, who proposed a rain insurance scheme based on an area approach. Other princely states such as Madras, Dewas, and Baroda also made unsuccessful efforts (AICL website). In independent India, crop insurance took formal shape in 1970, influenced by economist Prof. V. M. Dandekar, who advocated for an area-based approach. The first government-supported scheme was introduced in 1972. Since then, coverage has expanded, reaching approximately 30% of land holdings. A major milestone was the launch of **the Pradhan Mantri Fasal Bima Yojana (PMFBY)** in 2016, which significantly enhanced coverage and efficiency.

**First Crop Insurance Program**

A number of models of crop insurance were considered for feasibility by the Government and the 'first crop insurance program'(FCIS) based on 'Individual Approach 'was introduced in 1972-73 for cotton, Groundnut, Wheat and Potato and implemented in the states of Gujarat, Maharashtra, Tamil Nadu, Andhra Pradesh, Karnataka and West Bengal. This experimental scheme continued up to 1978-79 and covered only 3110 farmers for a premium of Rs 4.54 lakhs against claims of Rs 37.88 lakhs. It was realized that crop insurance programs based on the individual farm approach would not be viable or sustainable.

**Pilot Crop Insurance Scheme**

Building on the lessons learned from the **First Crop Insurance Scheme (FCIS),** the **Pilot Crop Insurance Scheme (PCIS)** was introduced in **1979**. This scheme was linked to **institutional credit** (crop loans), and followed an **area-based approach**. Participation was **voluntary** for state governments, with risk-sharing between the **General Insurance Corporation (GIC) and the respective state governments in a 2:1 ratio.** The scheme covered **cereals, millets, oilseeds, cotton, potatoes, grams, and barley**, with an insurance premium ranging from **5% to 10% of the sum insured**. It operated until **1984-85**, with **13 participating states**. During its tenure, it provided coverage to **6.27 lakh farmers,** generating a **premium income of □1.97 crore** against **claims of □1.57 crore**.

**Comprehensive Crop Insurance Scheme**

Building on the experience of the Pilot Crop Insurance Scheme (PCIS), the Comprehensive Crop Insurance Scheme (CCIS) was launched at the all-India level in Kharif (1985). Participation was optional for state governments and the scheme adopted a homogeneous area approach. It is compulsory for farmers to avail short-term crop credits. The CCIS operated for 15 years, from Kharif 1985 to Kharif 1999, with 15 states and two Union Territories participating. During this period, the scheme covered 7.63 crore farmers across 12.76 crore hectares, with a total insured amount of □24,949 crore at a premium of □403.56 crore. The total claims paid amounted to □2,303.45 crore, with a claim ratio of 1:5.71. Around 59.78 lakh farmers received compensation, with major claim disbursements in Gujarat (□1,086 crore, 47%), Andhra Pradesh (□482 crore, 21%), Maharashtra (□213 crore, 9%), and Orissa (□181 crore, 8%).

**National Agricultural Insurance Scheme**

The National Agricultural Insurance Scheme (NAIS) replaced CCIS in 1999 to ensure sustainability by shifting to an actuarial regime. It uses an indexing approach based on crop yield and offers three coverage levels with threshold yields of 60%, 80%, and 90%. NAIS covered food crops, oilseeds, and commercial/horticultural crops, which were initially managed by GIC and later by AIC. It was available to both borrowers and non-borrowers for crop loans, with 50% premium subsidies for small and marginal farmers. Farmers can buy additional coverage of up to 150% of the threshold yield. Implemented in 23 states and UTs, NAIS covered 22.90 crore farmers across 33.97 crore hectares over 30 seasons. By 2015, it had insured 25 million farmers, making it the world's largest crop insurance program (GFDRR 2011).

**Weather-Based Crop Insurance Scheme**

In 2007, the Weather-based Crop Insurance Scheme (WBCIS) was introduced in Karnataka as a pilot project by AIC. It follows an area-based approach and is currently offered by AIC and private insurers, such as ICICI Lombard and IFFCO Tokyo. WBCIS operates on actuarial premium rates capped at 8-10% for food crops and oilseeds and 12% for commercial crops, with subsidies shared equally between the Central and State Governments. Unlike NAIS, insurers bear the liability of the entire claim. It serves as an alternative to NAIS, and is not available in areas where NAIS is notified. In 2016, WBCIS was replaced by Restructured WBCIS (RWBCIS).

**Coconut Palm Insurance Scheme**

The Coconut Palm Insurance Scheme, launched in 2009-10 by the Coconut Development Board and the Agricultural Insurance Company of India, aims to protect coconut farmers from losses due to natural calamities, pests, and diseases. It covered trees aged 4–60 years, with a sum insured of □600 per

tree for younger palms and ₹1,150 for mature palms. Premium was shared among farmers, boards, and state governments. Implemented in major coconut-growing states like Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, and Odisha, the scheme covered damages from storms, droughts, pest attacks, and diseases. However, challenges, such as low awareness and delays in claim settlements, have limited their impact. Over time, it was integrated into broader agricultural insurance programs, such as the Pradhan Mantri Fasal Bima Yojana, requiring better outreach to improve farmer benefits.

### Modified National Agricultural Insurance Scheme

After 2010-11, NAIS was gradually replaced by Modified NAIS (MNAIS), implemented by AIC on behalf of the Ministry of Agriculture. Premium rates were actuarial, with up to a 70% subsidy shared equally by the Central and State Governments. The claims' liability rested entirely with insurers. The MNAIS introduced immediate relief, providing up to 25% of the likely claims in the case of calamities. This was compulsory for loanee farmers and voluntary for non-loanee farmers. Private insurers were allowed to encourage competition for the first time. The key participating states included Rajasthan, Andhra Pradesh, Bihar, West Bengal, Karnataka, and Uttar Pradesh.

### National Crop Insurance Programme

The National Crop Insurance Programme was launched in 2013-14 by the Government of India to provide comprehensive risk coverage for farmers against crop losses due to natural calamities, pests, and diseases. It aimed to streamline and merge existing crop insurance schemes under a single framework for better efficiency and wider reach. The program included three key components: the modified national agricultural insurance scheme, which improved upon the earlier insurance model by offering actuarial-based premiums and faster claim settlements; the weather-based crop insurance scheme, which provided compensation based on weather parameters such as rainfall and temperature; and the coconut palm insurance scheme, which covered coconut farmers against natural disasters, pests, and diseases. Under the programme, farmers availing crop loans were mandatorily covered, while non-loanee farmers voluntarily participated. The government subsidized the premiums to ensure affordability. However, the program faced challenges such as low awareness, delays in claim settlements, and implementation issues. In 2016, it was replaced by the Pradhan Mantri Fasal Bima Yojana, which simplified the structure, reduced premiums, and expanded coverage to benefit farmers nationwide.

### Pradhan Mantri Fasal Bima Yojana (PMFBY)

Pradhan Mantri Fasal Bima Yojana (PMFBY) was launched in 2016 to provide comprehensive risk coverage for farmers against crop losses due to natural calamities. It replaced previous schemes, such as NAIS and MNAIS, improving efficiency and increasing farmer participation. PMFBY covers all food crops, oilseeds, and annual commercial and horticultural crops. The premium rates are 2% for kharif crops, 1.5% for rabi crops, and 5% for commercial/ horticultural crops, with the remaining premium being subsidized by the Central and State Governments on a 50:50 basis. The scheme ensures faster claim settlement through technology, using satellite imagery, drones, and remote sensing for accurate yield assessments. In 2020, the PMFBY was voluntary for farmers, and the premium-sharing model was revised for certain states. By 2023, it had covered over 40 crore farmer applications, insuring over ₹25 lakh crore worth of crops. The scheme continues to evolve, incorporating digital advancements and better risk-management strategies to enhance its effectiveness.

### Current Status Of Agriculture Insurance In India

In India, agricultural insurance schemes aim to protect farmers from financial risks associated with crop failure due to natural disasters, pests, and diseases. The government has implemented several key insurance schemes over the years, with the most prominent being the **Pradhan Mantri Fasal Bima Yojana (PMFBY), the Coconut Palm Insurance Scheme (CPIS)**, and the Restructured **Weather-Based Crop Insurance Scheme (RWBCIS)**. Here, we provide an overview of the performances of these schemes.

**Table 1: State-wise progress under Pradhan Mantri Fasal Bima Yojana (PMFBY) & Restructured Weather Based Insurance Scheme (RWBCIS)- Combined from 2016-17 to 2023-24**

| State/UTs | Total Farmer Applications (In Lakhs) | Area Insured (In lakh hectares) | Sum Insured (In Rs. Crore) | Farmers Share in Premium (In Rs. Crore) | Gross Premium (In Rs. Crore) | Total Claims (In Rs. Crore) | Paid Claims (In Rs. Crore) | Claims Outstanding (In Rs. Crore) |
|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| A & N Islands | 0.03 | 0.02 | 0.11 | 0.05 | 0.17 | 0.27 | 0.23 | 0.04 |
| Andhra Pradesh | 298.06 | 141.36 | 103930.15 | 776.58 | 9195.83 | 5417.68 | 5392.05 | 25.63 |
| Assam | 51.43 | 30.78 | 22280.18 | 23.46 | 948.99 | 649.76 | 607.48 | 42.28 |
| Bihar | 50.17 | 46.09 | 21749.35 | 383.92 | 2444.91 | 749.37 | 749.37 | 0.00 |
| Chhattisgarh | 354.52 | 188.17 | 70692.70 | 1400.43 | 9005.68 | 6997.81 | 6977.46 | 20.35 |
| Goa | 0.03 | 0.01 | 15.21 | 0.19 | 0.22 | 0.14 | 0.14 | 0.00 |
| Gujarat | 83.94 | 112.33 | 53812.10 | 1499.42 | 12645.21 | 5526.42 | 5508.11 | 18.30 |
| Haryana | 196.84 | 140.43 | 94622.79 | 2056.28 | 7307.26 | 8567.20 | 8533.13 | 34.07 |
| Himachal Pradesh | 23.33 | 220.47 | 5819.50 | 223.17 | 776.98 | 426.98 | 409.71 | 17.28 |
| Jammu & Kashmir | 7.40 | 4.70 | 3095.79 | 55.83 | 265.29 | 99.69 | 95.51 | 4.18 |
| Jharkhand | 44.62 | 19.40 | 10733.46 | 75.15 | 1256.66 | 896.37 | 884.45 | 11.92 |
| Karnataka | 181.03 | 165.32 | 78021.95 | 2090.06 | 17196.19 | 12783.67 | 12572.56 | 211.11 |
| Kerala | 7.43 | 4.19 | 3176.27 | 62.61 | 596.96 | 574.58 | 566.05 | 88.52 |
| Madhya Pradesh | 835.60 | 913.69 | 329229.32 | 6124.47 | 38484.88 | 30472.75 | 30190.92 | 281.83 |
| Maharashtra | 1087.48 | 648.35 | 264521.26 | 5306.69 | 49720.94 | 32525.51 | 31896.40 | 627.10 |
| Manipur | 0.34 | 0.41 | 172.82 | 3.23 | 12.73 | 0.89 | 0.72 | 0.17 |
| Meghalaya | 0.44 | 0.18 | 136.87 | 0.84 | 12.07 | 0.52 | 0.52 | 0.00 |
| Odisha | 507.21 | 167.95 | 69952.87 | 1138.76 | 10177.73 | 6854.94 | 6777.51 | 77.42 |
| Puducherry | 1.46 | 0.68 | 441.76 | 0.23 | 32.25 | 37.81 | 28.51 | 9.29 |
| Rajasthan | 1575.17 | 810.76 | 283241.47 | 5763.76 | 37481.35 | 27366.83 | 26496.82 | 870.01 |
| Sikkim | 0.10 | 0.01 | 52.21 | 0.34 | 0.39 | 0.75 | 0.70 | 0.05 |
| Tamil Nadu | 328.45 | 115.48 | 71263.01 | 1223.77 | 16068.12 | 14167.14 | 14118.62 | 48.52 |
| Telangana | 39.04 | 40.11 | 27139.87 | 696.34 | 2389.32 | 1939.19 | 1906.80 | 32.40 |
| Tripura | 13.75 | 2.59 | 1781.17 | 3.33 | 52.75 | 8.63 | 8.04 | 0.59 |
| Uttar Pradesh | 429.11 | 315.12 | 154966.04 | 2786.92 | 10857.85 | 5279.52 | 5208.81 | 70.72 |
| Uttarakhand | 17.34 | 109.09 | 7684.93 | 269.34 | 1195.04 | 707.99 | 692.86 | 15.14 |
| West Bengal | 134.91 | 55.85 | 37345.91 | 305.51 | 2088.77 | 1222.83 | 1218.52 | 4.31 |
| Grand Total | 6260.25 | 4193.55 | 1714975.14 | 32270.06 | 229622.49 | 163279.24 | 160838.00 | 2441.23 |

**Source:** Agricultural Statistics at a Glance 2023, Department of Agriculture & Farmers Welfare, GOI

The Pradhan Mantri Fasal Bima Yojana (PMFBY) and Restructured Weather-Based Crop Insurance Scheme (RWBCIS) have significantly contributed to mitigating agricultural risks in India from to 2016-17 to 2023-24. Over this period, a total of 6260.25 lakh farmer applications have been processed, covering approximately 4193.55 lakh hectares of agricultural land with a total insured amount of ₹1714975.14 crore. The schemes collected ₹229622.49 crore in gross premiums, of which ₹32270.06 crore is the farmers' share. With ₹163279.24 crore in claims, ₹160838.00 crore has been settled, though ₹2441.23 crore remains outstanding. The states with the highest farmer participation include Rajasthan (1575.17 lakh applications), Maharashtra (1087.08 lakh applications), and Madhya Pradesh (835.60 lakh applications), suggesting that these regions are highly dependent on crop insurance. Similarly, Madhya Pradesh has the highest area insured (913.69 lakh hectares) and sum insured (₹329229.32 crore), closely followed by Maharashtra and Rajasthan. These three states are also the largest contributors to the gross premium collection, with Madhya Pradesh at ₹38484.88 crore and Maharashtra leading at ₹49720.94 crore. However, despite the large coverage and premium collection, claims settlement has been a challenge, especially in Rajasthan, which has the highest outstanding claims at ₹870.01 crore, followed by Maharashtra with ₹627.10 crore. This points to potential delays and inefficiencies in the administrative processes. On the other hand, states such as Goa, Meghalaya, and Tripura show very low participation, indicating that crop insurance schemes have not yet reached all regions equally.

**Table 2: Coconut Palm Insurance Scheme (CPIS)- cumulative (from 2009-10 to 2020-21)**

(₹ in lakh)

| State | No. of farmers | No. of Palms | Sum Insured | Premium | | | | Claims Paid | Farmers benefitted |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Farmer | State | CDB | Total | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Andhra Pradesh | 1,217 | 90,122 | 1,883.41 | 5.01 | 4.98 | 9.99 | 19.98 | 0.04 | 1 |
| Goa | 240 | 59,643 | 692.50 | 0.91 | 0.91 | 1.83 | 3.66 | 1.63 | 14 |
| Karnataka | 704 | 96,422 | 1,067.64 | 1.83 | 1.52 | 3.05 | 6.40 | 3.61 | 72 |
| Kerala | 52,583 | 21,01,047 | 22,769.36 | 30.23 | 30.23 | 60.45 | 120.91 | 341.28 | 7,394 |
| Maharashtra | 14,764 | 10,74,127 | 12,920.50 | 22.80 | 22.80 | 45.60 | 91.20 | 34.33 | 766 |
| Odisha | 799 | 25,310 | 418.35 | 0.81 | 0.81 | 1.62 | 3.24 | 0.16 | 3 |
| Tamil Nadu | 54,069 | 24,05,630 | 13,005.69 | 24.69 | 24.69 | 49.51 | 98.90 | 64.79 | 479 |
| West Bengal | 692 | 28,558 | 328.42 | 0.82 | - | 0.82 | 1.64 | - | - |
| Total | 1,25,068 | 58,80,859 | 53,085.87 | 87.11 | 85.95 | 172.87 | 345.93 | 445.84 | 8,729 |

**Source:** Agricultural Statistics at a Glance 2023, Department of Agriculture & Farmers Welfare, GOI

Table 2 provides a comprehensive overview of the agricultural insurance data for palm farmers across several Indian states, including Andhra Pradesh, Goa, Karnataka, Kerala, Maharashtra, Odisha, Tamil Nadu, and West Bengal. A total of 125,068 farmers were covered under this scheme, with Kerala having the highest number of participants (52, 583 farmers), while West Bengal had the lowest number of farmers (692). In terms of the number of palms insured, the total stands at 5,880,859, with Kerala again leading at 2,101,047 palms, and Odisha having the fewest at 25,310 palms. The total sum insured across all states amounts to ₹ 53,085.87 lakh, with Kerala contributing the highest sum insured at ₹ 22,769.36 lakh, and West Bengal the lowest at ₹ 328.42 lakh. Premium contributions are shared among farmers, the state, and the Coconut Development Board (CDB). Farmers have collectively contributed ₹ 87.11 lakh, states have contributed ₹ 85.95 lakh, and the CDB has contributed ₹ 172.87 lakh, bringing the total premium to ₹ 345.93 lakh. Claims paid out total ₹ 445.84 lakh, with Kerala receiving the highest amount at ₹ 341.28 lakh, while West Bengal has no claims paid. In terms of beneficiaries, 8,729 farmers have benefitted from the claims, with Kerala having the highest number of beneficiaries at 7,394 and Odisha the lowest at just 3. Kerala stands out prominently in almost every category, indicating a significant focus on palm farming and insurance in the state. By contrast, West Bengal shows minimal participation and no claims paid, suggesting either lower engagement or fewer incidents requiring claims. The balanced premium contributions among farmers, the state, and the CDB reflect shared financial responsibilities.

## Scope And Limitation

This study is primarily based on secondary data, which may lead to certain limitations, including the absence of real-time farmers' perspectives. While the analysis provides valuable insights into India's agricultural insurance landscape, international comparisons are limited and serve only as a contextual reference, rather than a detailed cross-country evaluation. Additionally, since the findings rely on existing research and publicly available data, they may not fully capture evolving challenges and farmers' experiences. Future studies could address these limitations by incorporating primary data collection through farmer surveys and expert interviews, thereby offering a more comprehensive understanding of the effectiveness and impact of agricultural insurance schemes.

## Conclusion And Policy Recommendation

Crop insurance plays a crucial role in protecting farmers in India from risks, such as natural disasters and crop failure. However, challenges, such as low participation in some areas, delayed claim settlements, and limited customization of policies, hinder their effectiveness. Several policy recommendations have been suggested to improve this system. First, expanding coverage to underserved regions through awareness campaigns and mobile platforms could increase participation. Investing in technology, such as satellite imagery and data analytics, can enhance risk assessment and speed up claim processing. Additionally, customizing insurance products to suit specific crops, regions, and climates will make policies more relevant and boost farmers' confidence. A nationwide campaign focused on financial literacy is essential for educating farmers on the benefits of insurance. Strengthening public-private partnerships can bring innovation and efficiency to the system, while integrating crop insurance with other agricultural programs will provide a holistic safety net. As climate change intensifies, it is crucial to develop insurance products for climate-related risks and promote resilient farming practices. Modernizing claims settlements through digital platforms and establishing a strong reinsurance market can further improve the system, making premiums more affordable for farmers. In conclusion, by implementing these reforms, India can create a more inclusive, efficient, and sustainable crop insurance system, protecting farmers and supporting agricultural growth.

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