



A Step Towards Sustainable Agriculture: Pradhan Mantri Fasal Bima Yojana (PMFBY)

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ABSTRACT

Agriculture is the backbone of India's economy, yet it remains highly vulnerable to climate variability, natural calamities, and market fluctuations. The Pradhan Mantri Fasal Bima Yojana (PMFBY), launched in 2016, represents a significant policy initiative by the Government of India to promote sustainable and resilient agriculture through a comprehensive crop insurance framework. The scheme aims to provide financial protection to farmers against crop losses arising from natural disasters, pests, and diseases, thereby ensuring income stability and reducing agrarian distress. By introducing affordable premium rates, leveraging technology-based assessment tools like remote sensing and drones, and ensuring transparent claim settlement, PMFBY fosters risk management and enhances farmers' confidence in agricultural production. In doing so, it not only supports the economic well-being of farmers but also contributes to the broader goal of sustainable agricultural growth. However, challenges such as delayed compensation, limited awareness, and administrative inefficiencies need to be addressed to realize its full potential. Overall, PMFBY is a vital step towards building a climate-resilient and sustainable agricultural ecosystem in India.

Key words: Crop Insurance; Sustainable Agriculture; Farmers' Welfare; Climate Resilience; Agricultural Sustainability; Financial Inclusion; Crop Loss Compensation; Technological Intervention; Rural Development; Agricultural Policy; Food Security.

Introduction

Agriculture is the backbone of India's economy, providing livelihood to nearly half of the population. However, Indian farmers often face uncertainties due to erratic weather, droughts, floods, and pest attacks, which can lead to severe crop losses. To address these challenges and ensure financial security for farmers, the Government of India launched the crop insurance scheme namely Pradhan Mantri Fasal Bima Yojana (PMFBY) on January 13, 2016. The PMFBY aims to provide comprehensive crop insurance coverage to farmers against natural calamities, pests, and diseases. It promotes sustainable agriculture by encouraging farmers to adopt modern and climate-resilient practices without the fear of financial loss. The scheme replaces earlier insurance programs with a uniform premium rate-only 2% for Kharif crops, 1.5% for Rabi crops, and 5% for commercial and horticultural crops-while the remaining premium is subsidized by the government.

One of the key features of the scheme is the use of technology such as remote sensing, smartphones, and GPS-based crop cutting experiments to ensure accurate and transparent assessment of crop losses. This minimizes delays and ensures timely claim settlements. The scheme is implemented through both public and private insurance companies, with active participation from state governments. PMFBY not only acts as a safety net for farmers but also contributes to sustainable agricultural growth. By reducing the economic burden of crop failure, it encourages investment in improved seeds, irrigation systems, and better farm management practices. It also helps stabilize rural incomes, thus reducing the distress that often leads to migration or indebtedness. Pradhan Mantri Fasal Bima Yojana represents a significant step toward building a resilient and sustainable agricultural sector in India. By protecting farmers from the vagaries of nature and fostering confidence in farming as a viable profession, the scheme paves the way for a secure and prosperous rural economy.

The unique benefit of the scheme is to protect farmers against unpredictable weather and climate risks. It encourages investment in better farming techniques. It also ensures timely compensation for crop loss and strengthens rural economy and food security.

Features of PMFBY:

Feature	Description
Launch Date	13 January 2016
Implemented by	Ministry of Agriculture & Farmers Welfare
Coverage	All farmers (loanee and non-loanee) growing notified crops
Premium Rate (Farmer's Share)	2% of sum insured for Kharif crops, 1.5% for Rabi crops, 5% for Commercial and horticultural crops
Remaining Premium	Subsidized by Central and State Governments- Prevented sowing or planting
Coverage of Risks	Standing crop (natural calamities, pests, diseases) post-harvest losses Localized calamities (hailstorm, landslide, inundation)
Technology Use	Remote sensing, smartphones, drones for quick and accurate crop loss assessment

The scheme is compulsory for farmers taking crop loans and voluntary for non-loanee farmers. Implemented through insurance companies empanelled by the government. The Claims are calculated based on yield data from Crop Cutting Experiments (CCEs). The aim is to settle claims within two months after yield data submission.

Need for the Study

Agriculture in India is highly dependent on monsoon rains and is frequently affected by climate change, erratic rainfall, droughts, floods, and pest attacks. These uncertainties lead to significant crop losses, threatening the livelihood of millions of farmers, particularly small and marginal ones who form the backbone of rural India. In such a scenario, ensuring income stability and risk coverage for farmers becomes essential for sustainable agricultural growth. The Pradhan Mantri Fasal Bima Yojana (PMFBY) was introduced to provide an effective crop insurance mechanism that mitigates agricultural risks, encourages farmers to invest in better inputs and technologies, and promotes long-term sustainability in the sector. Studying this scheme is crucial to understand its role in reducing farmers' vulnerability, improving financial security, and fostering climate-resilient agriculture. Furthermore, evaluating PMFBY helps identify implementation challenges, such as delays in claim settlements and lack of awareness, which hinder its full potential. The study is therefore needed to assess how effectively the scheme contributes to sustainable agriculture, rural development, and national food security, and to suggest policy measures for its improvement.

Review of Literature

Sharma et al., (2025) analysed PMFBY and highlighted how the scheme can contribute to sustainable agriculture by offering risk cover, thus reducing farmers' vulnerability. Girisha & Venkatesh (2023), "Analysis of Review of Literature on Pradhan Mantri Fasal Bima Yojana", several studies highlight gaps, delays in claim settlement, inadequate loss assessment, limited coverage of

tenant/sharecroppers, documentation burdens, and “flawed execution” though good concept. Another study by Prachi Kushwaha, YK Singh and DP Rai (2025), “Socio economic status of farmers enrolled in Pradhan Mantri Fasal Bima Yojna in Satna & Rewa looked at socio-economic status of enrolled farmers under PMFBY. They examined factors such as the affordability of premiums, timely claim settlement, and the extent of government support, the study provides insights into the effectiveness of the scheme in improving the socio-economic conditions of farmers. Vandana Sheoran et.al (2024) studies awareness among non-insured farmers regarding crop insurance, with nearly half of them being uninformed. Conversely, among insured farmers, the primary motivation for obtaining crop insurance stemmed from either bank compulsion or the pursuit of financial security. Concerns regarding premium rates were evident, with a majority perceiving them to be excessive. Recommendations for the enhancement of customer satisfaction and the promotion of greater farmer participation included the proposition of tailored insurance offerings and the mitigation of concerns pertaining to premium rates

Objectives

1. To examine the trend in participation of States/UTs, districts, and insurance units under PMFBY during Kharif and Rabi seasons from 2018 to 2024.
2. To analyse the share of marginal, small, and other farmers to assess inclusivity and coverage of vulnerable farmer groups.
3. To study the claims paid to different categories of farmers by the insurance companies.

Methodology

The present study was undertaken specifically because no in-depth study was undertaken in the country on the PMFBY launched by government of India. The study covered the period of seven years i.e. from 2018 to 2024. The study used only secondary data which was collected from various websites and data published by Indian Agricultural Department. To analyse the collected data and to understand the trends in the concepts, simple percentage analysis is used. This kind of studies give some understanding about the schemes adopted by the government and its benefit to the society. The whole data have been classified into two categories namely Kharif season and Rabi season and analysed each separately.

Trend in participation of States/UTs, Districts, and Insurance Units under PMFBY:

Number of State, District, Insurance Units, Crops Notification Under PMFBY Season: **Kharif**

Year / Category	2018	2019	2020	2021	2022	2023	2024
States / UTs	20	20	19	20	21	21	21
Districts	472	462	370	433	440	465	505
Insurance Units	147520	154485	127100	127134	147335	149081	149490
Agricultural Crops	35	37	36	49	54	53	40
Horticulture Crops	51	48	46	57	59	69	71

Source: Pradhan Mantri Fasal Bima Yojana (PMFBY) – Annual Statistics, 2018–2024.

The above table indicates consistent national participation after initial consolidation. The number of districts covered fell sharply in 2020 may be due to administrative restructuring or COVID, but rebounded strongly by 2024. Agricultural crops peaked in 2022 (54), then dropped to 40 in 2024. Horticultural crops steadily increased reaching a record 71 in 2024. It indicates diversification towards horticultural coverage. Due to COVID-19, visible decline was observed across districts and insurance units.

Number of State, District, Insurance Units, Crops Notification Under PMFBY Season: **Rabi**

Year / Category	2018	2019	2020	2021	2022	2023	2024
States / UTs	21	19	18	20	22	21	21
Districts	482	444	389	436	468	485	485
Insurance Units	134846	126784	112322	116290	129944	125261	125690
Agricultural Crops	39	38	36	52	60	59	46
Horticulture Crops	74	82	89	95	98	105	103

Source: <https://pmfby.gov.in/adminStatistics/dashboard>

State/UT Participation dipped between 2018–2020, likely due to rationalization and scheme restructuring, but regained momentum by 2022. A sharp fall was noticed in 2020 (COVID period), from then there is a consistent recovery since, stabilizing at 485 districts in 2023–24. When we look at insurance unit, it has decreased from 2018 to 2020, partially recovered but hasn't yet reached 2018 levels. There is a strong increase in agricultural crops up to 2022 (peak 60), suggesting diversification, then a fall to 46 in 2024. This may be due to shift towards. Pandemic year 2020 saw the lowest participation across all parameters, similar to the Kharif season. Post-2021, there's clear recovery and stabilization across most indicators. Horticulture coverage is showing continuous and strong growth in both Kharif and Rabi, reflecting a policy focus on crop diversification and high-value produce. Agricultural crop notifications, however, peaked in 2022 and slightly reduced afterward, possibly due to rationalization and better risk targeting.

Coverage Under PMFBY - Season: **Kharif**

Year / Category	2018	2019	2020	2021	2022	2023	2024
Farmers	21481975	19361979	16804816	15746568	19120847	4066882	25282296
Applications (Loanee Farmers)	20169889	22622154	26986330	37763962	46262521	52721246	60023625
Applications (Non- Loanee Farmers)	11061426	16337637	14042479	12610984	22996267	35684872	36952351
Applications (PMFBY)	29992861	37347465	40693200	49777829	68511785	86221098	95276313
Applications (RWBCIS)	1238454	1612326	335609	597117	747003	2185020	1699663
Area Insured PMFBY (in 000 Hect.)	27081.77	28402.44	26993.96	24760.16	26343.50	31471.73	31657.49
Area Insured RWBCIS (in 000 Hect.)	1530.97	1472.78	224.05	323.73	367.43	1113.78	927.73

Source: *Pradhan Mantri Fasal Bima Yojana (PMFBY) – Annual Statistics, 2018–2024.*

The data given in the table reveals that the coverage of farmers under PMFBY fell sharply from 21.5M (2018) to 15.7M (2021). This may be possibly due to state withdrawals and COVID disruptions. The year 2024 rebounded massively to 25.3M, the highest since inception. The loan application rose threefold. Non-loanee applications also grew significantly, showing wider voluntary uptake beyond credit-linked farmers. Total applications under PMFBY grew from 30M to 95M (2018–2024) over 200% increase in participation. The area insured under PMFBY remained largely stable around 26–31 million hectares, showing consistent land coverage. RWBCIS area shrank after 2018 (likely due to merging/streamlining) but saw partial recovery after 2022. RWBCIS participation contributes marginally to overall coverage (below 5%). Data shows inconsistency, possibly because not all states implement RWBCIS every year.

Coverage Under PMFBY - Season: **Rabi**

Year / Category	2018	2019	2020	2021	2022	2023	2024
Farmers	14598307	9620640	9911506	9849472	11009113	13411993	11767873
Applications (Loanee Farmers)	13265093	13034282	12306769	24040235	34183243	35729954	38850288
Applications (Non- Loanee Farmers)	9238855	5195175	7399286	8574699	8627348	19908372	13819728
Applications (PMFBY)	21776853	17503479	19314240	32224187	42274054	54704404	52007403
Applications (RWBCIS)	727095	725978	391815	390747	536537	933922	662613
Area Insured PMFBY (in 000 Hect.)	19363.14	15262.28	15486.72	14961.03	15086.57	18368.33	16211.27
Area Insured RWBCIS (in 000 Hect.)	7942.27	7887.35	6909.59	6616.55	8270.47	9899.57	11727.96

Source: <https://pmfby.gov.in/adminStatistics/dashboard>

Farmers coverage during rabi season fell drastically after 2018 due to state dropouts and COVID-19, bottoming in 2019. Steady recovery was notice since 2021, reaching 13.4M in 2023, then slightly down in 2024. It suggests stabilization of the scheme and renewed farmer confidence. Loanee farmers have nearly tripled (from 13M to 38.9M) driven by integration with Kisan Credit Card (KCC) loans. Non-loanee farmers participation more than doubled. Total PMFBY applications jumped from 21.8M to 52M (2018–2024). PMFBY area remained between 15 and 19 million hectares, showing steady coverage. RWBCIS area rose notably from 7.9M to 11.7M hectares (2018–2024), indicating increasing preference for weather-indexed insurance in Rabi crops (especially horticulture).

Share of marginal, small, and other farmers**Percentage Distribution of Farmers Under PMFBY - Season: Kharif**

Year / Category	2018	2019	2020	2021	2022	2023	2024
Marginal Farmers (%)	17.72	16.44	16.45	17.51	14.55	14.27	15.36
Small Farmers (%)	65.43	67.68	67.67	63.33	67.19	70.12	69.49
Others (%)	16.76	15.88	15.88	19.16	18.26	15.61	15.15
Total	100	100	100	100	100	100	100

Percentage Distribution of Farmers Under PMFBY - Season: Rabi

Year / Category	2018	2019	2020	2021	2022	2023	2024
Marginal Farmers (%)	19.26	18.38	17.45	18.04	15.73	15.80	18.11
Small Farmers (%)	62.93	60.89	64.13	60.94	64.38	66.79	63.29
Others (%)	17.81	20.73	18.42	21.02	19.89	17.41	18.60
Total	100	100	100	100	100	100	100

Source: Pradhan Mantri Fasal Bima Yojana (PMFBY) – Annual Statistics, 2018–2024.

The above tables give an idea about the percentage distribution of farmers under the insurance scheme considering both kharif and rabi season. By looking at the data given in tables, it is observed that across both seasons, over 80% of insured farmers are marginal and small, showing strong alignment with PMFBY's pro-smallholder mandate. In Kharif season mostly dominated by small farmers ($\approx 70\%$) which reflects higher dependence on rainfed agriculture. Participation is more evenly distributed in recent years (2023–24). In Rabi Season the marginal and "Other" (larger) farmer shares are both slightly higher than in Kharif. Indicates broader participation, possibly due to irrigation and crop diversification. Distribution proportions remain remarkably consistent, showing the scheme's structural balance over time.

Premium & Sum Insured Under PMFBY - Season: Kharif

Year / Category	2018	2019	2020	2021	2022	2023	2024
Farmers Premium (in Lakhs)	254890	244562	243038	232222	254622	180316	150411
State/UTs premium (in Lakhs)	722360	846985	838561	854142	927478	1052376	1017469
GoI Premium (in Lakhs)	696526	779272	801150	793678	820237	808226	772772
Gross premium (in Lakhs)	1673776	1870819	1882749	1880042	2002357	2040918	1940652
Sum Insured (in lakhs)	12085681	12456455	10932633	10174228	1270990	16833275	17420084

Source: <https://pmfby.gov.in/adminStatistics/dashboard>

Premium & Sum Insured Under PMFBY - Season: **Rabi**

Year / Category	2018	2019	2020	2021	2022	2023	2024
Farmers Premium (in Lakhs)	1588872	131848	140892	138949	140965	141904	142552
State/UTs premium (in Lakhs)	324428	321702	514091	540837	539490	422004	343473
GoI Premium (in Lakhs)	314388	315435	425915	431685	420510	361479	304627
Gross premium (in Lakhs)	797688	768985	1080898	1111471	1100965	925387	790652
Sum Insured (in lakhs)	9079663	7094326	8270057	7839660	8664284	10672242	9772133

Source: Pradhan Mantri Fasal Bima Yojana (PMFBY) – Annual Statistics, 2018–2024.

From the data given in the tables reveal that farmers' share remains relatively modest ($\approx 8\text{--}10\%$ of gross premium), reflecting strong government subsidy. In Kharif season there is a slight decline in total premium since 2023, possibly due to rationalization and improved risk assessment models. At the same time Rabi season's premiums peaked around 2021–22 and have since stabilized. When we see the sum insured, Kharif season saw a steep growth (44%) from ₹12.1 lakh crore (2018) to ₹17.4 lakh crore (2024). Rabi season maintained moderate growth ($\uparrow 8\%$) over the same period, with a sharp rise in 2023 due to expanded RWBCIS coverage and higher-value crops. Both GoI and State/UTs share the bulk ($\approx 85\text{--}90\%$) of premiums. States' contribution increased more sharply in Kharif due to state-wise re-implementation of PMFBY from 2020 onward. Kharif season dominates total PMFBY coverage due to monsoon exposure and high yield variability. Rabi season steadier premium levels and growing RWBCIS footprint, indicating focus on weather-risk management.

Claims paid to farmers under different categories:

Claim Paid to Farmers (in Lakhs) - Season: **Kharif**

Category/Year	2018	2019	2020	2021	2022	2023	2024
Prevented Sowing	28864	50212	4038	11229	9570	1698	5465
Localised	12730	5224	53227	266125	253472	180268	322797
Mid-term	5453	4549	5578	74442	74155	257735	76376
Yield Based	1283740	1797658	1252415	978790	66398	730212	281577
Post Harvest	2283	26626	14501	10123	59077	34719	87749
WBCIS	187148	152523	17678	18976	27513	29700	22255
Total Claim Paid	1520038	2036792	1347437	1359685	1087805	1234092	796219
Farmer Benefit PMFBY (Actual)	7283898	9160138	6200489	7721178	6833691	8815548	6205265
Farmer Benefit WBCIS (Actual)	1154647	1026259	106720	156260	150270	163862	86467
Total Farmer Benefit (Actual)	8438545	10186397	6307209	7877438	6983961	8979410	6291732

Source: Pradhan Mantri Fasal Bima Yojana (PMFBY) – Annual Statistics, 2018–2024.

Claim Paid to Farmers (in Lakhs) - Season: **Rabi**

Category/Year	2018	2019	2020	2021	2022	2023	2024
Prevented Sowing	41695	--	--	--	5524	5065	--
Localised	3513	21794	12407	17221	35449	44935	11289
Mid-term	7959	4678	--	--	134	1044	--
Yield Based	680805	407953	538063	427900	454455	290428	178141
Post Harvest	200	71	760	1734	20349	22228	15107
WBCIS	104373	115996	48569	93920	126458	141807	90578
Total Claim Paid	838545	550492	599799	540775	642369	505507	295115
Farmer Benefit PMFBY (Actual)	4600730	1980126	2739843	2830435	2571250	2418217	1196022
Farmer Benefit WBCIS (Actual)	483073	438363	206851	203180	284271	258211	128625
Total Farmer Benefit (Actual)	5083803	2418489	2946694	3033615	2855521	2676428	1324647

Source: <https://pmfby.gov.in/adminStatistics/dashboard>

With the data provided in the above tables, a comparative analysis has been made. When we look at Kharif season, consistently shows higher claims due to larger area and monsoon dependence. Rabi seasons' claims are smaller but steadier. Kharif season provides the bulk of financial protection. Rabi season sees smaller payouts, often influenced by WBCIS (weather-indexed) claims. The data reveals that PMFBY dominates in both seasons; WBCIS contributes more for Rabi crops. Kharif contributes ~70% of claims and beneficiaries are consistent with its larger insured area and monsoon-linked risks. Rise in smaller-scale but frequent claims show better granularity in data and on-ground verification through remote sensing. It was observed that in Rabi season smaller claim volume but steadier trend, suggests improved irrigation, lower weather dependency, and stronger risk resilience. On an average the data reveals that the claims paid have reduced, beneficiary reach remains high, indicating quicker, more targeted payouts with fewer catastrophic losses.

Conclusion

The Pradhan Mantri Fasal Bima Yojana (PMFBY) has emerged as a critical instrument for promoting sustainable agriculture in India. By providing financial protection against crop losses due to natural calamities, pests, and diseases, the scheme safeguards farmers' livelihoods and encourages investment in modern and resilient farming practices. Analysis of data from 2018 to 2024 shows that PMFBY has consistently supported farmers across both Kharif and Rabi seasons, with Kharif accounting for a larger share of claims and benefits due to monsoon-dependent risks. Over the years, the scheme has evolved to cover localized, mid-term, yield-based, and post-harvest losses, demonstrating flexibility and responsiveness to diverse agricultural risks. The increasing role of WBCIS (weather-based crop insurance) further enhances coverage for weather-sensitive crops, especially in Rabi.

By mitigating financial risks, PMFBY not only protects farmer incomes but also encourages crop diversification, investment in quality inputs, and adoption of climate-resilient practices, thereby laying the foundation for sustainable and secure agriculture. It represents a forward-looking step towards risk-informed farming, reducing vulnerability, and fostering long-term agricultural sustainability in India.

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Annexure

Concepts used in the study:

PMFBY stands for Pradhan Mantri Fasal Bima Yojana.

RWBCIS stands for Restructured Weather Based Crop Insurance Scheme. **WBCIS** stands for Weather Based Crop Insurance Scheme

Kharif crops are monsoon crops or autumn crops that are sown at the beginning of the rainy season (around June) and harvested in autumn (around September/October).

Rabi crops are winter crops that are sown in the autumn (October-December) and harvested in the spring (March-April)

Loanee farmers are farmers who have taken out short-term agricultural loans from financial institutions

Notified crops: Oilseeds: This covers all oilseed crops, Commercial/Horticultural Crops: This category includes annual commercial and horticultural crops, such as some fruits and vegetables.

