Inter - State Changes and Government Initiative for Policy Support Pradhan Mantri Fasal Bima Yojana (PMFBJ)-An Empirical Analysis

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ABSTRACT

The evolution of crop insurance in India spans nearly half a century, shaped by insights from various pilot studies and review committees. The first nationwide initiative the Comprehensive Crop Insurance Scheme was launched in 1985–86 marking a significant milestone in agricultural risk management. This scheme was later replaced by the National Agricultural Insurance Scheme in 1999–2000 followed by the introduction of the Weather-Based Crop Insurance Scheme in 2007–08 and subsequently the Modified National Agricultural Insurance Scheme in 2010–11. Except for WBCIS which was the only index-based insurance scheme all other programs operated on an indemnity-based model. Moreover, these schemes adopted an area-based approach rather than an individual-based one. In line with the "One Nation – One Scheme" concept, the Government of India launched the Pradhan Mantri Fasal Bima Yojana (PMFBY) as its flagship crop insurance program. The primary objective of PMFBY is to provide financial support to farmers in the event of crop loss caused by pests, diseases, hailstorms, droughts, or floods. Under this model, farmers pay a nominal premium, while the central and state governments share the remaining subsidy. PMFBY offers comprehensive coverage for a wide range of crops across all stages of the crop cycle from pre-sowing to post-harvest losses. Administered by agricultural insurance companies, the scheme aims to minimize farmers' financial vulnerability and promote sustainable rural livelihoods. Consequently, the present study focuses on analyzing government-paid and reported claims, as well as examining the extent of benefits availed by farmers under the PMFBY framework
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Keywords: Scheme, Government support and harvest

INTRODUCTION

Agriculture continues to be the backbone of rural livelihoods in India, yet farmers remain highly vulnerable to climatic shocks such as droughts, floods, pest attacks, and extreme weather. This vulnerability has intensified due to climate change, making agricultural risk management increasingly vital. Crop insurance serves as a critical safety net by stabilizing farm income, reducing yield uncertainty, and supporting long-term investment decisions.

India has experimented with multiple crop insurance models—ranging from the Comprehensive Crop Insurance Scheme (1985–86) to the National Agricultural Insurance Scheme (1999–2000), Weather-Based Crop Insurance Scheme (2007–08), and Modified NAIS (2010–11). While these schemes represented incremental policy improvements, they faced challenges related to administrative delays, high premium burden, and inequitable access.

In 2016, the Government of India launched the **Pradhan Mantri Fasal Bima Yojana (PMFBY)**—a unified indemnity-based insurance program designed to reduce farmer premiums, offer broader coverage across crop cycles, and improve claim settlement through streamlined processes. However, despite its policy relevance, PMFBY's impact remains varied across states, and existing literature highlights gaps in awareness, enrolment, claim settlement timelines, and the participation of small and marginal farmers.

The present study addresses these gaps by examining interstate variations in PMFBY implementation and identifying the determinants influencing benefit realization.

REVIEW OF LITERATURE

Ruchbah Rai (2019) examined The Indian economy's core sector is still agriculture. Only 16 percent of the nation's GDP comes from it, while 43.9 percent of people rely on it for their daily needs. The study evaluates how well the PMFBY has performed in terms of adaptation and achieving the goal of "one nation, one scheme." Chauhan and Patel (2021) appraised that low prices and natural disasters are just two of the numerous difficulties that Indian agriculture faces. A broad insurance policy against crop failure is offered by the Pradhan Mantri Fasal Bima Yojana (PMFBY), which also assists in stabilizing the covered farmers' income. The purpose of the study was to determine member farmers of PMFBY's level of understanding.

Rohtas & Vandana Sheoran (2024) studied that the Pradhan Mantri Fasal Bima Yojana (PMFBY) has emerged as a crucial initiative to provide financial protection to farmers against such risks. In Haryana, PMFBY has been instrumental in extending this protection and ensuring prompt settlement of claims. A total of 600 households from Haryana, comprising both 300 insured and 300 non-insured farmers in equal proportion were selected to acquire primary data. The data collection utilized the stratified random sampling technique to ensure representation across diverse segments within the farming community. The research found that the disparities in awareness levels between insured and non-insured farmers across various risk categories and crops in districts like Kaithal, Hisar, and Jhajjar and also the survey revealed that insured farmers generally exhibit higher awareness levels, emphasizing the need for targeted education programs for non-insured farmers to bridge the knowledge gap.

Meena et al. (2022) aimed to assess the knowledge and attitude of farmers towards the Pradhan Mantri Fasal Bima Yojana (PMFBY) in the Washim, Malegaon, and Risod talukas of Washim district in Maharashtra, India. The sample consisted of 120 non-loanee farmers selected purposively from twelve villages. The findings showed that the majority of respondents had a medium level of knowledge (72.50%) and a moderately positive attitude (65.83%) towards PMFBY. The study emphasized the importance of awareness and knowledge about the benefits and conditions of the PMFBY scheme in shaping Farmers favourable attitudes towards it.

Darshan et al. (2021) explored the level of knowledge among farmers regarding the government scheme Pradhan Mantri Fasal Bima Yojana (PMFBY) in Tumkur district of Karnataka, India. The study selects 120 farmer beneficiaries of PMFBY using random sampling techniques and collects data through structured interviews. The research revealed that comprehensive knowledge of the scheme and insurance coverage against natural disasters can greatly benefit farmers. It also emphasizes the need for timely and complete information on PMFBY to be provided by extension personnel working at the grassroots level.

Paulraj & Easwara (2020) examined to analyse the performance of the scheme among Paddy farmers in the state of Tamil Nadu during 2019 prior to revamping. The research as attempted to evaluate the proposed changes in revamping with relevance to the issues faced by various stakeholders of crop insurance. Among the insured farmers, claim not triggered and delay in settlement were the major problems faced in the scheme. Among un-insured farmers, credibility was the major issued for non-enrolment and also collected the response of Agricultural Officials towards the operation of the scheme in the study area. The results found that the recent revamping is grounded and well planned to make an impact in the crop insurance arena. However, the increase in awareness activities is highly necessary to increase the cover of farmers and to stabilise the numbers.

Objective of the study

- To find out the farmers application insured, area insured reported claims, paid claims and farmers application benefitted in PMFBY among different states
- To identify the determinants of number of farmers benefitted through PMFBY Program

METHODOLOGY

The present study is based on secondary data collected from 17 states of India for the period 2016–2020. The required data were compiled from the official website of the Pradhan Mantri Fasal Bima Yojana (PMFBY), Ministry of Agriculture and Farmers Welfare, Government of India (https://pmfby.gov.in/). The analytical tools and framework adopted for the study were derived from the same source.

Two analytical tools were employed for data analysis:

Cost–Benefit Analysis and
Discriminant Analysis

Cost–Benefit Analysis

The Cost–Benefit Analysis was used to evaluate the financial efficiency of the Pradhan Mantri Fasal Bima Yojana by comparing the cost incurred with the benefit gained. It measures the extent to which benefits are realized per unit of cost incurred. The formula used for the analysis is as follows:

$$\text{Cost–Benefit Ratio} = \frac{\text{Benefit}}{\text{Cost}} \times \mathbf{100}$$

Here, Benefit refers to the claims paid, and Cost represents the insurance coverage or premium paid under the PMFBY. As per the PMFBY analytical framework, the Cost–Benefit Analysis typically covers the period 2019–20 to 2023–24, including both Kharif and Rabi seasons. However, in the present study, this analytical approach has been adapted for the period 2016–2020, with data taken for 2019 for comparison purposes, to ensure consistency with the scheme's official evaluation method. This adaptation allows a meaningful assessment of financial efficiency during the earlier phase of the scheme's implementation.

Discriminant Analysis

The Discriminant Analysis is a multivariate statistical technique used to determine which variables best discriminate between two or more naturally occurring groups. In this study, discriminant analysis was employed to identify the key factors contributing to interstate variations in the implementation and performance of the PMFBY.

The estimated discriminant function is expressed as:

$$\mathbf{Y = X_1 + X_2 + X_3 + X_4 + X_5}$$

Where:

Y= Farmer benefit

$\mathbf{X_1}$= Farmer applications insured

$\mathbf{X_2}$= Area insured

$\mathbf{X_3}$= Sum insured

X_4= Reported claims

X_5= Paid claims

When Group I was compared with Group II, the discriminant coefficient function was derived to measure the extent to which these variables differentiate between the two groups. This analysis facilitated the identification of the most significant factors influencing the efficiency and performance of the PMFBY across different states.

Finding Of The Study

The data collected and simply represented in the form of diagrams and charts; interpretation of the data is also given meaning information. Hence the finding of the current study is presented and discussed under the following tables.

Table – 1 Reported Claims

Reported Claims (Crore)					
State	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**Average**
Andhra Pradesh	943.77	743.86	1,890.05	1,259.01	1209.17
Assam	5.37	1.18	2.79	17.27	6.65
Goa	0.03	0.01	0.10	0.01	0.04
Gujarat	1,267.22	1,076.75	2,778.08	354.89	1369.24
Haryana	296.94	895.98	946.79	932.26	767.99
Himachal Pradesh	45.18	64.71	55.00	64.60	57.37
Jammu & Kashmir	-	9.84	26.24	-	18.04
Karnataka	2,093.83	856.84	2,947.50	1,357.79	1813.99
Kerala	43.74	10.96	26.74	85.90	41.84
Madhya Pradesh	2,043.88	5,879.88	3,777.21	5,905.48	4401.61
Maharashtra	2,317.90	3,293.81	6,069.36	6,755.92	4609.25
Rajasthan	1,917.45	2,242.38	3,466.65	4,920.44	3136.73
Tamil Nadu	3,648.15	2,058.79	2,656.32	1,090.13	2363.35
Telangana	179.60	648.50	587.31	402.28	454.42
Uttar Pradesh	574.58	380.87	469.16	1,116.75	635.34
West Bengal	421.69	261.59	535.52	-	406.27

Source: Compiled from pmfby.gov.in

From the above table we can say that Rajasthan has higher number of areas insured for 2016-17 and Goa has lower number in 2018-19 and the Madhya Pradesh has a higher average value and Goa has low average value for the Number of areas insured.

Table – 2 Paid Claims

Paid Claims (Crore)					
State	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**Average**
Andhra Pradesh	943.77	740.18	1,885.76	1,254.03	1205.94

Assam	5.37	1.18	2.79	-	3.11
Goa	0.03	0.01	0.10	0.01	0.04
Gujarat	1,267.22	1,075.83	2,777.89	111.67	1308.15
Haryana	296.94	895.98	944.89	927.45	766.32
Himachal Pradesh	45.18	64.71	55.00	58.01	55.73
Jammu & Kashmir	-	9.84	26.24	-	18.04
Karnataka	2,093.83	856.84	2,946.94	1,215.35	1778.24
Kerala	43.73	10.96	26.74	85.90	41.83
Madhya Pradesh	2,043.88	5,879.88	3,776.74	5,811.75	4378.06
Maharashtra	2,317.90	3,292.50	6,063.04	6,747.05	4605.12
Rajasthan	1,917.45	2,242.38	3,466.65	4,920.31	3136.70
Tamil Nadu	3,648.15	2,057.27	2,656.32	1,056.84	2354.65
Telangana	179.60	648.50	148.90	-	325.67
Uttar Pradesh	574.58	380.87	469.16	1,092.74	629.34
West Bengal	421.69	261.11	529.92	-	404.24

Source: Compiled from pmfby.gov.in

From the above table we can say that Maharashtra has higher number of paid claims for 2019-20 and Goa has lower number in 2017-18 and the Maharashtra has a higher average value and Goa has low average value for the Number of paid claims

Table-3 Cost Benefit Analysis

State	Sum Insured	Paid Claims	Cost Benefit Ratio
Andhra Pradesh	1209.17	11.45	0.94
Assam	6.65	0.11	1.69
Goa	0.04	0.00	1.33
Gujarat	1369.24	6.38	0.46
Haryana	767.99	3.81	0.49
Himachal Pradesh	57.37	1.31	2.28
Jammu & Kashmir	18.04	0.19	1.06
Karnataka	1813.99	11.47	0.63
Kerala	41.84	0.44	1.07
Madhya Pradesh	4401.61	22.92	0.52
Maharashtra	4609.25	63.13	1.36
Rajasthan	3136.73	26.73	0.85
Tamil Nadu	2363.35	13.79	0.58
Telangana	454.42	2.41	0.53

Uttar Pradesh	635.34	8.33	1.31
West Bengal	406.27	8.16	2.00

Source: Compiled from pmfby.gov.in

The cost benefit analysis is taken for four years average from 2016-2020 for 16 different states. The above table says that, from this Cost Benefit Analysis Himachal Pradesh has a higher benefit and Gujarat has a lower benefit ratio for the farmers from this Policy Support Pradhan Mantri Fasal Bima Yojana (PMFBJ) Scheme.

Cost Benefit Analysis of the Pradhan Mantri Fasal Bima Yojana (PMFBY)

Cost–benefit analysis (CBA) helps assess the financial efficiency of the Pradhan Mantri Fasal Bima Yojana (PMFBY) by comparing the benefits (claims paid) with the costs incurred (insurance coverage). The ratio provides an understanding of how much benefit is realized per unit cost. The analysis covers **2019–20 to 2023–24**, including both **Kharif and Rabi** seasons.

Table -4 Year-wise and Season-wise Cost-Benefit Analysis

Year	Season	Farmer applications Insured (in Lakh)	Paid Claims (Rs. In Crore)	Cost–Benefit Ratio
2019–20	Kharif 2019	128.61	5829.23	45.33
2019–20	Rabi 2019–20	17.05	929.12	54.50
Total (2019–20)		**145.66**	**6758.35**	**46.40**
2020–21	Kharif 2020	109.83	1257.85	11.45
2020–21	Rabi 2020–21	14.23	301.80	21.21
Total (2020–21)		**124.06**	**1559.65**	**12.57**
2021–22	Kharif 2021	85.07	3793.53	44.60
2021–22	Rabi 2021–22	13.95	819.93	58.80
Total (2021–22)		**99.03**	**4613.47**	**46.60**
2022–23	Kharif 2022	97.66	4041.64	41.38
2022–23	Rabi 2022–23	9.68	990.55	102.32
Total (2022–23)		**107.34**	**5032.20**	**46.88**
2023–24	Kharif 2023	168.63	7485.86	44.40
2023–24	Rabi 2023–24	73.19	1034.33	14.13
Total (2023–24)		**241.82**	**8520.18**	**35.23**

Source: Compiled from *pmfby.gov.in*

The current study determines the Discriminant analysis

The cost–benefit ratio varies across years and seasons, indicating fluctuations in claim disbursements relative to the number of farmers insured. The **highest CBR** (102.32) was observed during **Rabi 2022–23**, reflecting substantial claims paid per unit insured. The **lowest CBR** (11.45) occurred in **Kharif 2020**, indicating lower

payouts relative to coverage. On average, the scheme demonstrates a **positive benefit trend**, signifying continued support for farmers through effective risk coverage and compensation mechanisms.

Table – 5 Determinants of interchange variation in the implementation of PMFBJ Scheme

Items	Group - I	Group - II	Mean Difference (xi)	Discriminant coefficient (bi)	bi * xi	Relative discriminating power (%)
Farmer Application (xi)	59.51	15.69	-43.8177	-0.642	28.1187	0.07
Area Insured (xii)	57.17	13.08	-44.0966	-0.537	23.6699	0.06
Reported Claim (xiii)	2922.35	375.72	-2546.63	-7.465	19011.5227	44.61
Paid Claim (xiv)	2909.79	355.25	-2554.538	9.225	-23566.097	55.26

Source: Compiled from pmfby.gov.in

From Table 5, it is evident that paid claims are the most significant factor influencing interstate variations in the implementation of the Crop Insurance Scheme, accounting for 55.26 percent of the total variation. This is followed by reported claims with 44.61 percent, while farmer applications and area insured contribute only 0.07 percent and 0.06 percent, respectively. The estimated discriminant function was statistically valid, as indicated by a Mahalanobis D^2 value of 0.856. The canonical correlation was found to be 2.94, and the corresponding chi-square value of 0.715 confirmed that the two groups differed significant.

RESULTS AND DISCUSSION

The analysis of reported and paid claims across the selected states reveals substantial interstate disparities in both crop loss incidence and the effectiveness of PMFBY implementation. States such as Maharashtra, Madhya Pradesh, Rajasthan, and Karnataka consistently exhibit high volumes of reported and settled claims. This trend reflects not only their extensive agricultural areas and high levels of farmer participation, but also their recurrent exposure to climatic shocks—including droughts, unseasonal rainfall, and pest outbreaks—which trigger frequent indemnity payouts. Conversely, states like Goa, Himachal Pradesh, and Kerala show considerably lower claim values, which may be attributed to their smaller insured areas, limited crop diversity, and relatively stable agro-climatic conditions. These contrasts highlight the uneven vulnerability profile across regions as well as differential levels of engagement with the scheme. A comparison of reported and paid claims further underscores variations in claim settlement efficiency. In certain states, paid claims closely align with reported claims, suggesting more streamlined administrative processes and stronger institutional coordination between state authorities, insurance companies, and implementing agencies. However, in states where a sizeable gap persists between reported and paid claims, delays in crop-cutting experiments, inadequate verification infrastructure, and bottlenecks in insurer–state coordination appear to hinder timely compensation. Such administrative constraints—previously highlighted in CAG reports and policy evaluations—pose a significant challenge to realizing PMFBY's objective of providing prompt financial relief to farmers. The pattern of farmer applications and area insured also indicates differences in scheme outreach and awareness. States with high enrolment, such as Maharashtra and Madhya Pradesh, tend to have stronger institutional mechanisms, higher historical exposure to risk, and greater familiarity with insurance programs. In contrast, states with persistently low enrolment reflect limited insurance literacy, weaker extension services, and lower penetration among small and marginal farmers. This raises concerns regarding the inclusivity of PMFBY, as regions with low awareness may also be those most vulnerable to climatic disturbances. The cost–benefit analysis reinforces these disparities. States like Himachal Pradesh and West Bengal display relatively higher benefit ratios due to the concentration of losses among a smaller insured population, while agriculturally intensive states such as Gujarat and Haryana show lower ratios,

suggesting variations in either reporting behaviour or actual loss incidence. These findings collectively show that the efficiency and impact of PMFBY are shaped not only by climatic conditions but also by administrative capacity, awareness levels, and the institutional readiness of states to implement large-scale insurance mechanisms. Overall, the results indicate that while PMFBY has achieved significant reach and has provided substantial financial support to farmers in high-risk states, its performance remains uneven across regions. Enhancing claim settlement efficiency, improving transparency in loss assessment, expanding awareness—particularly among small and marginal farmers—and strengthening state-level institutional mechanisms are essential to improving the scheme's uniformity and effectiveness.

CONCLUSION

The Pradhan Mantri Fasal Bima Yojana has emerged as a cornerstone of agricultural risk management in India, providing crucial financial protection against crop losses. This study finds significant interstate disparities in enrolment, area insured, claim reporting, and claim settlement. Climatic vulnerability and administrative efficiency largely determine scheme performance across states. While PMFBY has improved insurance penetration and provided substantial financial relief to farmers, persistent issues—such as delayed claim settlement, regional inequalities, low awareness among small and marginal farmers, and limited transparency—continue to constrain its impact. Strengthening digital monitoring, increasing institutional capacity, expanding awareness programs, and enhancing accountability mechanisms are essential to improving the scheme's efficiency and inclusiveness. With appropriate reforms, PMFBY can evolve into a robust instrument for securing farmer livelihoods and enhancing agricultural resilience in India.

Limitations Of The Study

- The study relies solely on secondary data from official sources.
- Analysis is limited to 17 states due to data availability.
- The study excludes farmer perceptions owing to the absence of primary data.
- District-level variability and crop-specific risks are not examined.

Ethical Consideration:

The study is based entirely on publicly available secondary data. Hence, no ethical clearance was required.

Data Availability:

All data used in this study were sourced from the official Pradhan Mantri Fasal Bima Yojana portal (https://pmfby.gov.in).

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