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RESEARCH PAPER

Adoption Dynamics and Barriers of Pradhan Mantri Fasal Bima Yojana (PMFBY): Insights of Coastal and Inland Regions of Odisha

Rishita Sen[1]*, Sarba Narayan Mishra[2] and Ankhila R.H[3]

[1]Department of Agricultural Economics, OUAT, College of Agriculture, Bhubaneswar, Odisha, India
[2]Professor and Head, Department of Agricultural Economics, OUAT, College of Agriculture, Bhubaneswar, Odisha, India
[3]Scientist, ICAR-Indian Institute of Water Management, Bhubaneswar, Odisha, India

*Corresponding author: rishita0808@gmail.com (**ORCID ID:** 0009-0002-6742-2550)

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ABSTRACT

Effective agricultural risk management is essential to safeguard the livelihoods of farmers against climate variability and market uncertainties. Given the ongoing pressures from climate change and economic challenges, protecting farmers from yield losses is increasingly important. The study examines the growth of Pradhan Mantri Fasal Bima Yojana (PMFBY) in Odisha, identifying key adoption drivers and barriers that farmers face in participating. Primary data were gathered from 140 adopters and 60 non-adopters in two purposively selected districts in Odisha, which was analyzed using Compound Annual Growth Rate (CAGR), Cuddy Della Valle Index (CDVI), Logit regression, and Garrett's ranking technique. Farmer enrollment under PMFBY has shown steady growth during the *Kharif* season (15.53%) but was relatively low in the *Rabi* season (0.12%). The number of beneficiaries rose significantly in both *Kharif* (53.27%) and *Rabi* (57.56%) seasons, though with high variability. However, claim payouts demonstrated a negative growth rate and high instability across both seasons. Factors such as education and awareness about crop insurance were significant in influencing adoption, with access to credit and social networks further encouraging uptake. Common issues faced by both adopters and non-adopters included the absence of local grievance mechanisms, delays in Crop Cutting Experiments (CCE), late insurance settlements, lack of transparency, and incomplete documentation in the cultivator's name. Enhancing farmer awareness through extension services, social media, and other communication platforms, alongside tailoring insurance units to individual farms, could improve risk coverage and strengthen the scheme's impact.

HIGHLIGHTS

- The PMFBY scheme in Odisha has achieved stable growth in farmer coverage during the *Kharif* season with moderate variability, while the Rabi season witnessed minimal growth.
- Despite the increasing total sum insured, the insured area and claims paid under the scheme exhibited negative growth rates, reflecting declining coverage and payouts over time.
- In Kendrapara; age, education level, household size, easy access to credit, awareness of insurance products, availability of non-farm income, and social contacts demonstrated a statistically significant relationship with the adoption of crop insurance. While in Bargarh; education, farm income, and awareness of insurance policies significantly affected adoption.
- Major challenges identified include delays in claim settlements, lack of grievance redressal mechanisms, and issues with document verification, which significantly impact effectiveness of the scheme for insured and non-insured farmers alike.

Keywords: Crop insurance, PMFBY, logit regression, garett ranking, physical performance, constraints

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In India, the agriculture sector plays a crucial role in supporting the livelihoods of around 42.3 percent of the population, while accounting for 18.2 percent of the country's GDP at current prices (PIB, 2024). Erratic weather patterns heighten risks that can negatively impact crop yields and food security, presenting challenges for farmers who depend on stable weather conditions for successful harvests (Motha, 2011). Ensuring the resilience of agricultural sector is essential not only for maintaining food security but also for protecting the livelihoods of rural communities and ensuring the overall economic stability of the nation.

In this context, crop insurance emerges as a vital tool to stabilize farm income. By promoting technological advancement, encouraging investment, and enhancing financial support for the agricultural sector, insurance mechanisms offer essential protection, empowering farmers to manage risks more effectively and support the long-term sustainability of agriculture in India. Additionally, crop insurance enhances farmers' self-respect and autonomy by establishing their right to compensation in the event of crop loss (Chandrakanth & Rebello, 1980). It serves as a safety net, shielding farmers from the financial volatility brought on by uncontrollable natural disasters like fire, adverse weather, floods, pests, and diseases (Roy et al., 2017). Beyond financial stability, crop insurance encourages sustainable farming practices as farmers feel more secure in adopting modern, risk-reducing methods. This sense of security helps farmers focus on increasing productivity and adopting environmentally friendly practices, as they are better protected from potential setbacks. Through these means, crop insurance fosters a resilient agricultural economy that can withstand environmental and economic shocks.

Though the agricultural insurance sector is expected to grow at 2.5 percent over medium term from 2024 onward, the agricultural growth rate in 2023-24 was 1.4 percent, which is a sharp decline from the 4.7 percent growth rate in 2022-23. The decrease can be attributed mainly to inadequate and postponed monsoon seasons resulting from El Nino (Economic Survey, 2023-24). In Odisha, farmers face substantial crop loss risks from natural disasters such as floods, droughts, and cyclones. In August 2022, heavy rains and floods affected 124,474.61 hectares of crops in 22 districts of Odisha. The crop loss was found to be 33 percent or more in these areas (Government of Odisha). In the year 2023, the extent of paddy crop cultivation in the state declined to about 28 lakh hectares, compared to 32 lakh hectares in 2022. This reduction is largely attributed to erratic rainfall patterns that disrupted the sowing process, in addition to extensive crop damage resulting from flooding and inundation in the coastal areas.

Crop insurance plays a critical role in reducing agricultural losses by providing a financial cushion against the effects of natural disasters and market fluctuations. By compensating farmers for crop damage due to unforeseen events, crop insurance minimizes income volatility, allowing farmers to maintain their livelihoods despite adverse conditions. An assessment of the Pradhan Mantri Fasal Bima Yojana (PMFBY) in Odisha for the Kharif and Rabi seasons of 2023-24 can be conducted using various indicators, which will help to illustrate the impact of the scheme and its effectiveness in delivering financial protection to farmers. This study, therefore, aims to (1) assess the performance of the Pradhan Mantri Fasal Bima Yojana (PMFBY) in the state, (2) identify factors influencing farmers' decisions to adopt the scheme, and (3) examine the challenges farmers encounter while participating in the program.

MATERIALS AND METHODS

Sources of data and sampling frame

Odisha, an Eastern Indian state with diverse agro-climatic zones, was selected for this study for the 2023–2024 financial year. Of its 30 districts, 8 are coastal and 22 are non-coastal. Kendrapara (a coastal district in the East and South Eastern zone) and Bargarh (a non-coastal district in the Western Central tableland zone) were purposively chosen as high-performing districts under the PMFBY scheme. For the purpose of analyzing the effectiveness of the Pradhan Mantri Fasal Bima Yojana (PMFBY) in Odisha, secondary data was gathered from the Department of Agriculture, Government of Odisha, which includes information from the years 2016-17 to 2023-24. This dataset includes statistics on the number of farmers enrolled, area insured, premiums collected, subsidies received, and claims paid, enabling an assessment of the scheme's reach

and impact over time. The collected data allowed for calculating the Compound Annual Growth Rate (CAGR) and assessing instability using the Cuddy-Della Valle Index (CDVI), facilitating a comprehensive analysis of the growth of the scheme and stability.

To evaluate farm-level conditions and factors influencing the adoption behaviour of farmers under Pradhan Mantri Fasal Bima Yojana (PMFBY) in Odisha, a primary survey was conducted during the *kharif* 2023-24 period. Data was gathered from 200 farmers, 140 adopters and 60 non-adopters across two districts, with 100 farms sampled from Kendrapara and 100 from Bargarh. A multistage purposive and random sampling approach was applied, selecting two blocks from each district based on scheme performance and data availability. From each block, 50 farmers were sampled randomly. The selection of Kendrapara (coastal) and Bargarh (non-coastal) districts aimed to capture varied socio-economic and agronomic conditions, providing a comprehensive view of the impact of the scheme in differing agro-climatic zones.

Analytical tools

Growth trend of physical and financial performance of PMFBY

Compound Annual Growth Rate (CAGR)

The Compound Annual Growth Rate (CAGR) was employed to assess the growth performance of the Pradhan Mantri Fasal Bima Yojana (PMFBY) across key variables, including farmer enrollment numbers, total area insured, premiums collected, subsidies received, claims paid, and beneficiary counts.

The CAGR for these crop insurance indicators was calculated using an exponential function, following the method outlined by Gujrati (2007).

$$Y_t = Y_0 (1+r)^t$$

$$CAGR\ in\ percentage = [(antilog\ b) - 1] \times 100$$

Where,

Y_t = Dependent variable for which the growth rate has been estimated for a particular year

Y_0 = Dependent variable in initial year, r = Compound growth rate, t = 1, 2, 3 …….. years

Instability Index

The instability index was calculated for each variable to assess the type and extent of instability within different aspects of the scheme. The Cuddy-Della Valle Index was chosen for this purpose, as it adjusts for the trend component in time series data, providing a more accurate measure of instability than the coefficient of variation (CV) alone (Cuddy and Della Valle, 1978).

Cuddy Della Valle Instability Index:

$$CDVI = CVx\left[\sqrt{(1-R)^2}\right]$$

Where,

CDVI = Instability index

CV = Coefficient of variation

R^2 = Adjusted coefficient of determination

Determinants affecting the adoption of PMFBY among the farmers

Logit Regression

Logit regression is the most widely used method for modelling a dichotomous dependent variable. In such cases, the response variable typically takes the form of 1 or 0, where 1 usually represents success and 0 represents failure.

The simple logistic model is expressed as follows:

$$\text{Logit (Y) = Natural log (odds)} = \ln\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta x$$

Where,

Y : categorical, X : continuous or categorical

The model shows a linear relationship between the logit of Y and X, with the coefficient β indicating direction: a positive β means higher X values increase Y logit, and a negative β means they decrease it. Parameters α and β are estimated via maximum likelihood (MLI), with dichotomous outcomes coded as 0 or 1 and categorical predictors represented by dummy variables.

Specifying an Empirical Model

Farmers who adopted crop insurance were assigned a value of (Y = 1), while those who did not adopt the insurance were assigned a value of (Y = 0). In this context, the purchase of crop insurance serves as the dependent variable. The specification of the logit model is as follows:

$$Logit\ Y = b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5 + b_6 x_6 + b_7 x_7 + b_8 x_8 + b_9 x_9 + b_{10} x_{10} + b_{11} x_{11} + b_{12} x_{12} + b_{13} x_{13} + u_i$$

Where, Y = Adoption of crop insurance (1 for adopted and 0 for not adopted)

x_1 = Age (years)

x_2 = Education (years)

x_3 = Farm size (acres)

x_4 = Household size

x_5 = Availability of non-farm income (1, if yes; 0, otherwise)

x_6 = Caste

x_7 = Contact with extension agencies (1 for yes, 0 for no)

x_8 = Availability of irrigation facility (1 for yes, 0 for no)

x_9 = Easy Access to credit (if, yes = 1 or no = 0)

x_{10} = Awareness about insurance policy (if, yes = 1 or no = 0)

x_{11} = Farming experience of farmers (in years)

x_{12} = Fellow farmer's influences (1, if yes; 0, otherwise)

x_{13} = Social contacts of the farmer

b_1, b_2 . . . b_{13} are parameters corresponding to estimated variables' coefficients.

u_i is the error term and consists of unobservable random variables.

Constraints faced by farmers in adopting PMFBY

Garrett ranking technique

The Garrett ranking technique was used to analyze the constraints and suggestions for the effective implementation of PMFBY. The formula applied to calculate the percent position of each rank is:

$$Percent\ position = 100\ (R_{ij} - 0.5)/N_j$$

Where,

R_{ij} = Rank given for the i^{th} items by the j^{th} individual and

N_j = Number of items ranked by the j^{th} individual.

RESULTS AND DISCUSSION

Socio-economic characteristics of sample respondents

The demographic profile of beneficiaries and non-beneficiaries across Kendrapara and Bargarh districts provides insights into the socioeconomic structure of these farmer groups. In Kendrapara, beneficiaries largely fall within the 40-60 age range (47%), whereas the same age range comprises an even higher percentage among non-beneficiaries (83.33%). A similar trend is observed in Bargarh, with the majority also between 40-60 years. Educationally, both districts reveal that the primary and higher secondary levels are prevalent among beneficiaries, although Bargarh shows a higher proportion of primary education among non-beneficiaries (76.67%). The caste distribution of farmers says that, a majority in both districts belong to the Other Backward Classes (OBC) category, making up over 50 percent of both beneficiaries and non-beneficiaries. Gender distribution indicates a male dominance, with approximately 75-83 percent of the sample being male across both groups and districts. Farmer categorization reveals that in Kendrapara, most beneficiaries are marginal farmers (64.29%), while in Bargarh, medium farmers form the largest group among beneficiaries (81.43%). Family structure varies, with most families comprising 4 to 6 members, and farming experience is extensive, especially in Kendrapara, where more than 30 percent of non-beneficiaries have over 30 years of experience. Annual family expenditure among Bargarh beneficiaries is significantly higher, with 77.14 percent spending above ₹ 120,000, compared to only 17.14 percent in Kendrapara. Income distribution highlights that Bargarh's beneficiaries are mostly in the higher income brackets, while in Kendrapara, incomes are more evenly distributed. Most beneficiaries in both districts are loanee farmers, indicating their active engagement in formal credit mechanisms.

Table: Socio-economic characteristics of sample respondents in percent (n = 200)

Variables	Kendrapara (n=100)		Bargarh (n=100)	
	Adopters (n=70)	Non-Adopters (n=30)	Adopters (n=70)	Non-Adopters (n=30)
Age				
Upto 40	10	0.00	21	2
40-60	47	83.33	48	25
Above 60	13	16.67	1	3
Educational Qualification				
Illiterate	10.00	3.33	0.00	0
Primary	30.00	30.00	35.71	76.67
Secondary	15.71	30.00	21.43	13.33
Higher Secondary	30.00	33.33	34.29	3.33
College	14.29	3.33	8.57	6.67
Caste				
General	31.42	20	17.14	20
OBC	57.14	66.67	57.14	56.67
SC	7.14	6.67	18.57	13.33
ST	4.29	6.67	7.14	10.00
Gender				
Male	75.71	83.33	82.86	83.33
Female	24.29	16.67	17.14	16.67
Category of Farmer				
Marginal	64.29	66.67	4.29	10.00
Small	28.57	23.33	10.00	13.33
Medium	7.14	10.00	81.43	63.33
Large	0.00	0.00	4.28	10
Family Member				
Less than 4	18.57	23.33	24.29	20.00
4 to 6	47.14	63.33	61.43	56.67
More than 6	34.29	13.33	14.29	23.33
Farming Experience				
Upto 10 Years	4.29	0	8.57	3.33
11 to 20	35.71	43.33	51.43	33.33
21 to 30	37.14	26.67	34.29	43.33
More than 30	22.86	30.00	5.71	33.33
Annual Family Expenditure (₹/Year)				
Upto 80000	22.86	30.00	0.00	10.00
81000-100000	42.86	26.67	10	3.33
100000-120000	17.14	26.67	11.43	16.67
Above 120000	17.14	16.67	77.14	70.00
Annual Family Income (₹/Year)				
Upto 80000	7.14	6.67	0.00	13.33
81000-100000	31.43	23.33	5.71	6.67
100000-120000	30	40	5.71	3.33
Above 120000	31.43	30	88.57	76.67
Type of Farmer				
Loanee	71.43	0	80	0
Non Loanee	28.57	100	20	100

Growth and instability of performance of PMFBY in Odisha

Physical performance of PMFBY in Odisha

The physical performance, including parameters such as the total number of farmers covered, loanee and non-loanee farmers, area covered, number of beneficiaries, and crops covered has been discussed under various headings. The analysis of the progress of PMFBY in Odisha (Table 1) for the *Kharif* season, beginning in 2016, shows a steady rise in farmer coverage, from 1,763,476 in 2016-17 to 16,617,361 in 2023-24, with a CAGR of 15.53 percent and an instability index of 8.07, indicating stable growth. Similar patterns were noted by Namdev (2013) in Madhya Pradesh. Loanee and non-loanee farmer coverage saw a significant increases, with CAGRs of 28.66 percent and 98.23 percent, respectively. Non-loanee coverage spiked notably from 2019 onward. The number of beneficiaries fluctuated but grew with high instability (CDVI of 98.20). A possible reason for these fluctuations could be the changing awareness and adoption of the crop insurance scheme, influenced by government efforts, and the frequency of adverse climatic events. However, the insured area followed a negative CAGR of -2.03 percent, suggesting limited success in expanding coverage.

During the *Rabi* season, the progress of PMFBY in farmer coverage was slow, with a growth rate of only 0.12 percent from 2016 to 2023, consistent with findings by Roy *et al.* (2018), who noted slow overall progress of PMFBY across India. However, non-loanee farmers saw significant growth, with a remarkable 90.07 percent increase, mirroring the trend in the *Kharif* season, as observed by Sheoran and Kait (2023) in Haryana. The number of benefiting farmers also grew by 57.56 percent. Despite these increases, the CDVI of 96.34 indicates substantial volatility in the scheme's impact. The area insured showed a negative CAGR of -3.016 percent, reflecting a decline over time despite recent growth. These patterns suggest inconsistency in the expansion of the scheme during the *Rabi* season.

Table 1: Performance of physical parameters of PMFBY in Odisha from 2016-2023

Year	Farmers Covered (nos)	Coverage of Loanee Farmers (nos)	Coverage of non-loanee Farmers (nos)	Farmers Benefitted (nos)	Area covered (in ha.)	Crop covered (nos.)
KHARIF						
2016-17	1763476	1732800	30676	167884	12.57	5
2017-18	1824428	1672191	152237	752688	13.46	7
2018-19	1784618	1749512	272909	652181	14.26	7
2019-20	1999868	2877842	1882430	972765	18.44	8
2020-21	1586110	7597678	1863095	1614177	11.39	8
2021-22	1235930	5972704	2391724	1948804	10.50	8
2022-23	1165129	5751211	2501722	NA	9.58	8
2023-24	16617361	7587359	6041527	NA	15.30	8
CAGR	**15.53**	**28.66**	**98.23**	**53.27**	**-2.03**	**5.32**
CDVI	**8.07**	**32.54**	**29.10**	**98.20**	**18.09**	**9.23**
RABI						
2016-17	55231	52817	2414	2055	71.25	6
2017-18	61837	58887	2950	14338	67.68	9
2018-19	69320	66382	12821	11157	68.65	9
2019-20	63110	188760	13916	43013	66.28	9
2020-21	52328	197299	102339	28818	50.94	9
2021-22	34777	168036	61310	24883	41.81	9
2022-23	28774	136925	51763	NA	33.17	9
2023-24	133595	384900	266647	NA	105.45	9
CAGR	**0.12**	**28.33**	**90.07**	**57.56**	**-3.01**	**3.43**
CDVI	**24.59**	**38.86**	**58.69**	**96.34**	**21.57**	**13.36**

Source: *Authors' compilation from Ministry of Agriculture and farmers welfare.*

Financial performance of PMFBY in Odisha

The financial performance of PMFBY in Odisha from 2016-17 to 2023-24 showed significant variation across key indicators, such as the total sum insured, claims paid, and contributions from farmers, the state government, and the Government of India. The total sum insured grew at a 2.90 percent rate, indicating the scheme's expanding reach. Claims paid fluctuated, peaking at ₹ 1,76,459.85 lakh in 2017-18, then dropping to a low of ₹ 53,427.08 lakh in 2022-23, with a negative CAGR of -3.16 percent, possibly due to fewer reported losses or better risk management. Farmers' premium contributions declined steadily, with a negative CAGR of -19.14 percent, likely due to higher subsidies. Meanwhile, the state government's contribution rose sharply, with a CAGR of 17.39 percent, reflecting stronger support to sustain coverage. The CDVI revealed considerable volatility in financial indicators, with GOI contributions showing the highest instability with CDVI 43.32, while the sum insured was relatively stable showing CDVI of 26.95.

Table 2 presents the financial progress of PMFBY in the *Rabi* season, showing modest growth in the sum insured at 0.86 percent, indicating slow expansion in coverage. Claims paid exhibited high volatility with a negative CAGR of -2.53 percent, possibly due to better risk management or fewer crop losses over time. In contrast, the state government's contribution rose significantly, with a CAGR of 38.95 percent. Claims paid and state contributions showed the greatest instability with CDVI ranging from 116.35 and 128.93 respectively, reflecting fluctuating support and payout patterns. This analysis underscores the financial variability of the scheme and the essential role of governmental support.

Factors influencing the decision to opt PMFBY

Several factors influence farmers' decisions to

Table 2: Performance of financial parameters of PMFBY in Odisha from 2016-2023

Year	Sum insured (Lakh ₹)	Claim paid (Lakh ₹)	Farmer share (lakh ₹)	State share (lakh ₹)	GOI share (lakh ₹)
KHARIF					
2016-17	688861.21	42938.92	13769.89	19738.36	19738.36
2017-18	723703.75	176459.85	14488.32	34743.53	34743.53
2018-19	835549.76	114420.57	16749.50	47694.87	47694.87
2019-20	1207700.08	109903.00	24174.99	97964.92	97964.92
2020-21	767634.44	55981.98	15356.14	63521.97	63521.97
2021-22	707815.10	115971.95	14147.34	62300.37	62300.37
2022-23	689015.85	53427.08	13772.85	61830.79	61830.79
2023-24	1151844.97	NA	1279.40	84953.81	60167.89
CAGR	**2.90**	**-3.16**	**-19.14**	**17.39**	**14.06**
CDVI	**26.95**	**36.40**	**37.39**	**40.20**	**43.32**
RABI					
2016-17	35024.05	210.59	476.62	82.16	82.16
2017-18	35024.05	210.59	476.62	82.16	82.16
2018-19	42161.48	4276.60	610.97	637.15	637.15
2019-20	44204.69	3047.51	638.77	92.08	92.08
2020-21	44624.73	9884.70	667.21	212.31	212.31
2021-22	33098.68	1271.02	490.19	495.99	495.99
2022-23	28253.47	794.73	413.45	432.42	432.42
2023-24	24209.20	681.26	344.67	344.65	344.65
CAGR	**0.86**	**-2.53**	**-22.06**	**38.95**	**33.34**
CDVI	**39.97**	**116.35**	**21.49**	**128.93**	**98.93**

Source: *Authors' compilation from Ministry of Agriculture and farmers welfare.*

adopt crop insurance. Understanding these key determinants is crucial for shaping policies that can enhance their effectiveness and boost adoption rates. Additionally, examining the relationship between independent and dependent variables is essential for a comprehensive analysis.

To identify the key factors affecting crop insurance adoption, a logit regression analysis was used, and the results are presented in Table 3. The logit regression analysis presented provides insights into the determinants of farmers' decision to adopt crop insurance in the Kendrapara and Bargarh districts. A comparative analysis between these two regions reveals significant variation across several variables.

In Kendrapara, variables such as age, education level, household size, easy access to credit, awareness of insurance products, availability of non-farm income, and social contacts demonstrated a statistically significant relationship with the adoption of crop insurance. Mensah *et al.* (2015) also found in their study that the key factors for the adoption of crop insurance included education level, savings, farm size, on-farm revenue, and land tenure. Age exhibited a negative association with adoption, suggesting that younger farmers in this area are more inclined to opt for insurance compared to their older counterparts. Household size had a positive and significant influence on adoption behavior, indicating that larger families are more likely to be insured. Additionally, caste, often linked to socio-economic status or landholding size, had a significant negative impact, implying that marginalized or lower-category farmers in Kendrapara were less likely to participate in crop insurance programs. One of the most crucial factors was access to credit facilities. In Kendrapara, the positive and substantial coefficient indicates that farmers with greater access to credit were significantly more likely to adopt insurance. This finding aligns with Akinrinola *et al.* (2014), who reported that credit accessibility was the main factor driving farmers' insurance adoption decisions. Moreover, social contact among farmers showed a

positive and significant relationship with adoption behaviour, suggesting that those with larger social networks were more likely to take up insurance. Other variables, such as landholding size, farm income, access to irrigation, farming experience, and peer influence had no significant impact on insurance adoption.

However, the factors influencing adoption differ in Bargarh, reflecting variations in social and cultural aspects of the farming community. Here, education, farm income, and awareness of insurance policies significantly affected adoption. The effect of farm income was only significant in Bargarh, where higher income levels slightly increased the likelihood of adopting insurance. In both districts, education and awareness of crop insurance exhibited positive and significant relationships with the dependent variable, indicating that higher education levels and greater awareness among farmers strongly enhance insurance adoption. However, this effect was more pronounced in Bargarh, suggesting that these factors play a more critical role there. Aditya *et al.* (2018), and Carrer *et al.* (2020) similarly found that increased awareness, access to credit sources education levels, and technological support positively influenced the likelihood of farmers opting for insurance schemes. In contrast, variables such as age, landholding size, household size, caste, access to credit, irrigation availability, farming experience, peer influence, availability of non-farm income, and social contacts had no significant effect on insurance adoption in Bargarh. These findings are consistent with those of Karthick and Mani (2013), Hazarika and Yasmin (2018), Sona and Muniraju (2018), and Cariappa *et al.* (2019), who identified factors like age, education level, credit access, information sources, and farming experience as critical determinants of crop insurance adoption decisions.

Challenges faced by farmers in availing PMFBY

Problems faced in adopting PMFBY by the beneficiary farmers

To ensure the effectiveness of crop insurance programs such as the Pradhan Mantri Fasal Bima Yojana (PMFBY), it is essential to examine the challenges faced by farmers who participate in these schemes. In this study, the Garett ranking method was used for assessing and prioritizing the difficulties experienced by beneficiary farmers.

The findings reveal that the most significant issue reported by farmers in Kendrapara district was the absence of a mechanism to address individual grievances, which was rated highest (Table 4).

Table 3: Key determinants of the adoption of PMFBY in the study area

Variables	Kendrapara	Bargarh
Age of the sample farmers	-0.08***	-0.10
	(0.03)	(0.07)
Level of education	0.58**	0.90**
	(0.25)	(0.39)
Size of landholding	-0.32	-0.24
	(0.48)	(0.55)
Family size	0.40*	-0.01
	(0.21)	(0.16)
Farm income	-0.01	0.01*
	(0.01)	(0.01)
Caste	-1.05**	-0.09
	(0.43)	(0.54)
Easy access to credit facilities	2.75***	-1.25
	(0.79)	(1.49)
Availability of irrigation	1.03	0.08
	(0.63)	(0.77)
Awareness of crop insurance products	1.62*	2.49*
	(0.88)	(1.51)
Farming experience (in years)	-0.08	-0.04
	(0.05)	(0.07)
Influences of fellow farmers	0.36	1.09
	(0.83)	(0.69)
Availability of non-farm income	-0.23**	0.90
	(0.77)	(0.81)
Social contacts	1.21**	0.66
	(0.50)	(0.63)
Constant	6.83**	0.89
	(3.19)	(3.83)
Model Adequacy Test		
Log pseudo-likelihood	-34.62	-32.28
Wald $chi^2(13)$	41.53	25.29
Pseudo R^2	0.44	0.46
Observations	100	100

*Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

This was followed by delays in conducting crop cutting experiments, and delays in claim payments, ranking third. Other significant concerns identified

include a lack of transparency in claim settlements, threshold yields lower than actual yields, and limited awareness of the different types of risks covered under the scheme. Less commonly reported issues include the documentation requirements for enrollment, which may be mitigated by the active engagement of line departments in providing farmers with necessary information. Challenges such as difficulties in opening bank accounts and issues with premium payments were also noted. The latter issue is likely alleviated by the state's policy of setting a standard premium of ₹ 1 for farmers, with the remaining amount subsidized by the government. These observations are consistent with findings from Majumder (2021), Dandekar (1985), and Raju and Chand (2008), which suggest that similar constraints have been a persistent issue since the inception of crop insurance in India.

In Bargarh district, insured farmers also reported significant challenges with the crop insurance policy. According to the results presented in Table 4, the most pressing issue identified is the delay in conducting crop cutting experiments was ranked first. This aligns with the studies by Majumder (2021) and Nain *et al.* (2017). This is followed by delays in claim payments and lack of transparency in claim settlements. The delays in claim payments may stem from the late disbursement of premium subsidies by the government to insurance companies or delays in reporting losses. The least significant issues reported include access to bank accounts, awareness of the types of risks covered, and difficulties in paying premiums.

Reasons given by non-beneficiary farmers for not availing PMFBY

It is essential to analyze the reasons behind the non-adoption of PMFBY by non-insured farmers to understand the challenges in implementation. Identifying these obstacles can help address the issues, ultimately improving the scheme's utilization and effectiveness for the benefit of farmers.

In Kendrapara and Bargarh districts, farmers reported multiple barriers to adopting the Pradhan Mantri Fasal Bima Yojana (PMFBY), with distinct issues emerging in each region. In Kendrapara, the leading reason for non-adoption was delays in claim payments (Table 5), followed by lack of transparency in claim settlements, likely due to multiple bureaucratic layers that cause information gaps and reduce accountability. The third most-cited reason was the absence of landholding documents in the cultivator's name, often due to untransformed land titles or tenant farming, while the need for multiple visits to government offices for both enrollment and claims was also a significant deterrent. Less critical reasons included the lack of compensation for partial crop losses, absence of local grievance redress mechanisms, and cases of farmers not receiving compensation despite enrollment. These issues align with findings from Jiragal *et al.* (2023), who noted similar obstacles such as partial loss exclusions and insufficient compensation.

As presented in Table 6, in Bargarh district, the primary barrier was the absence of land ownership documentation for tenant farmers, leading to

Table 4: Problems identified by the insured farmers in Kendrapara and Baragarh district

Sl. No.	Particulars	Kendrapara		Bargarh	
		Mean Score	Rank	Mean score	Rank
1	Lack of clarity in claim processing	54.79	IV	64.67	III
2	Complicated paperwork	43.33	VII	—	—
3	Delay in carrying out CCE	64.16	II	74.67	I
4	Late disbursement of insurance settlements	63.54	III	65.13	II
5	Knowledge of risk coverage	45.06	VI	30.86	VIII
6	Challenges in paying insurance premiums	24.31	IX	24.09	IX
7	Opening of bank account	35.41	VIII	37.57	VII
8	Absence of local grievance redressal system	72.66	I	57.37	IV
9	Threshold yield is lower than actual yield	46.74	V	43.67	VI
10	Coverage limited to losses from natural disaster	—	—	51.97	V

Table 5: Reasons for not availing PMFBY by farmers in Kendrapara

Sl. No.	Particulars	Mean score	Rank
1	Delayed payment of claims	71.90	I
2	No transparency in claim settlement	70.20	II
3	Lack of documents in the name of cultivar	53.07	III
4	Requires multiple visits to the department from enrollment to claim	48.37	IV
5	Compensation not provided in case of partial crop loss	46.93	V
6	No mechanism to redress grievance at local level	45.10	VI
7	Did not receive compensation for past consequetive years	43.57	VII
8	Awareness about features/types of risk covered	40.13	VIII
9	Not aware about existence of PMFBY	30.73	IX

Table 6: Reasons for not availing PMFBY by farmers in Bargarh

Sl. No.	Particulars	MEAN SCORE	Rank
1	Land paper is not in name of Cultivar	62.77	I
2	Adequate compensation not available	57.03	II
3	Delay in settlements of claims	55.23	III
4	Social stigma to get into complex procedure	55.13	IV
5	Biased settlement of payments	52.63	V
6	Did not receive compensation for past consequetive years	52.17	VI
7	Not satisfied with the scheme	48.07	VII
8	Not felt the need for crop insurance	40.23	VIII
9	Not aware about crop insurance	26.73	IX

difficulties in obtaining landowner permissions (Garrett score of 62.77). The perception of inadequate compensation followed as the second main concern (score of 57.03), and delays in claim settlements ranked third (score of 55.23). Farmers also cited the complexity of the enrollment and claim processes, which fostered social stigma around the scheme, as a significant deterrent. Other concerns included biased claim settlements, repeated failures to receive compensation, and general dissatisfaction with the scheme. The least significant issues in both districts included low awareness of PMFBY, limited understanding of the risks covered, and a perceived lack of need for insurance, highlighting gaps in outreach and communication. These findings align with Jamanal *et al.* (2019), who reported similar challenges in crop insurance adoption across various regions.

CONCLUSION

The performance of PMFBY in Odisha reveals notable progress and challenges. Farmer coverage in the *Kharif* season has shown steady growth, especially among non-loanee farmers, whose enrollment rates have significantly increased. However, the insured area has declined over time, and the number of claims paid exhibits high variability, indicating instability in benefits distribution. Adoption of the scheme is positively influenced by factors like education, awareness, and access to credit, with Kendrapara and Bargarh districts highlighting distinct challenges. Farmers in Kendrapara face issues with grievance redressal, while Bargarh farmers struggle with delayed claim payments and transparency in settlements. For non-insured farmers, concerns include inadequate documentation, compensation delays, and lack of clarity in claims. Improving these areas will be crucial for PMFBY to deliver consistent financial protection and encourage wider adoption. To improve crop insurance, shifting the insurance unit from village panchayat to individual farm level could better address diverse farming conditions and minimize risks. Implementing efficient Crop Cutting Experiment (CCE) systems alongside accessible

grievance redressal mechanisms would build trust among farmers. Investing in digital platforms would streamline applications and provide real-time claim updates, enhancing transparency. Involving farmers in policy-making would also ensure that insurance schemes align with their needs and perspectives, bridging the gap between farmers and the government.

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