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Original Research Article

Determinants of Farmers' Awareness and Perspectives on Pradhan Mantri Fasal Bima Yojana in Southern Tamil Nadu

ABSTRACT

Farmers in India face numerous risks that significantly impact their crop production, highlighting the need for effective crop insurance. Recognizing the limitations of the existing crop insurance system, the Government of India initiated the Pradhan Mantri Fasal Bima Yojana (PMFBY) during the Kharif 2016 season. This scheme offers competitive premiums and favourable terms, yet coverage of farmers remains low. This study investigates the factors influencing the farmers' awareness and perceptions of the PMFBY scheme. The survey was conducted to collect primary data from 350 cotton farmers in Virudhunagar district, Tamil Nadu. Findings reveal that while farmers have partial awareness of various aspects of crop insurance, they are generally informed about premiums and procedural requirements. The probit model analysis identifies education, organizational membership, mass media exposure, and extension contacts as positively influencing farmers' awareness levels. However, negative perceptions persist, particularly concerning delayed claims, inadequate compensation, and high premium rates. This study recommends the implementation of government-led awareness programs designed to educate and cultivate greater awareness among farmers regarding crop insurance and its benefits. Such initiatives could enhance demand for crop insurance to mitigate the adverse impacts and ensure greater sustainability of farmers' livelihoods.

Keywords: Awareness, Crop insurance, Perception, Cotton farmers

30 **1 Introduction**

31 Agriculture is a vital income source in many developing countries, including India. In
32 this nation, about 60% of the population depends on farming for their livelihood (MoA&FW,
33 2024; Rajeev & Nagendran, 2023; Sundar & Ramakrishnan, 2015). However, Indian farmers
34 encounter significant agricultural challenges due to the unpredictability of natural events
35 (Budhathoki et al., 2019; Gulati et al., 2018; Senapati, 2020; Sundar & Ramakrishnan, 2015).
36 Small and marginal farmers, who constitute around 80% of the agricultural community, are
37 particularly susceptible to the high risks associated with crop production (Aditya et al., 2020;
38 Rajeev & Nagendran, 2023). The frequent failure of crops can lead to farmers accruing
39 significant debt, adversely affecting both agriculture and the farm economy (Singh, 2010).
40 Therefore, it is essential to implement effective strategies to stabilize and protect the
41 agricultural sector (Karthick & Mani, 2013). One of the most promising solutions to address
42 these challenges is crop insurance, which has been recognized as a vital tool for managing
43 agricultural risks (Fahad & Jing, 2018; Gulati et al., 2018; Hossain et al., 2022; Venkatesh,
44 2008). Crop insurance allows farmers to protect their livelihoods against natural disasters
45 such as droughts, floods, cyclones, hailstorms, pest infestations, and diseases (Gulati et al.,
46 2018). Additionally, it promotes a sense of self-reliance and dignity among farmers, as it
47 provides them with the right to claim compensation in the event of crop loss, thus mitigating
48 the financial impact of unforeseen natural events (Kumar et al., 2011).

49 Despite being introduced in 1972, crop insurance in India has faced numerous
50 challenges (Gulati et al., 2018). Over the years, these schemes have seen various
51 modifications aimed at improving claims processing, premium rates, and other key aspects
52 (Kaur et al., 2021). In response to the limitations of previous insurance systems, the
53 Government of India launched the PMFBY in the Kharif season of 2016 (Gulati et al., 2018).
54 Indian crop insurance programs are known for their broad coverage among farmers.
55 However, India still has the largest population of uninsured farmers globally (Aditya et al.,
56 2018). Although there is significant research and implementation in the field of agricultural
57 insurance, there remains ambiguity regarding the extent to which farmers prefer this method
58 over other risk management strategies (Ghosh et al., 2021). Despite the attractive terms and
59 low prices, only a few farmers purchase insurance under the new PMFBY policy
60 framework (Aditya et al., 2018; Ghosh et al., 2021). Therefore, it is crucial to analyze the
61 factors contributing to this low popularity, given the significant role of the insurance program
62 in supporting India's agrarian economy (Aditya et al., 2018).

63 Within this context, our study is focused on three main objectives: i) To understand
64 the level of farmers' knowledge of crop insurance, ii) To analyze the factors influencing their
65 awareness of crop insurance, and iii) To examine the perceptions of insured farmers
66 regarding crop insurance. This study contributes to the existing literature by identifying
67 which features of crop insurance are most important to farmers. Additionally, the study
68 identifies factors that hinder farmers' awareness of crop insurance. By improving farmers'
69 understanding of crop insurance and addressing their knowledge gaps, the demand for crop
70 insurance can be increased. Furthermore, the study explores insured farmers' perceptions of
71 crop insurance, providing insights that can help policymakers make necessary adjustments to
72 existing policies, thereby enhancing their overall efficiency and effectiveness.

73 **2 Review of literature**

74 Determining the demand for crop insurance is challenging worldwide, with low
75 adoption in developing countries (Ghosh et al., 2021). The complexity in these countries
76 arises from government interventions to stabilize farm incomes through various means like
77 quotas, price support systems, subsidies, and low-interest loans (Ghosh et al., 2021; Mensah
78 et al., 2023). Singh and Agrawal (2020) found that limited access to agricultural insurance is
79 mainly due to farmers' lack of understanding about insurance and their preference for relief
80 payments. The current crop insurance plans are not working well due to state-level issues.
81 The study by Basir et al. (2024) revealed a significant and positive connection between
82 farmers' risk attitudes and the size of their farms, with farmers' awareness of crop insurance
83 serving as the dependent variable. Ghosh et al. (2021) suggested that understanding which
84 parts of crop insurance matter most to farmers can help improve existing policies.

85 Islam et al. (2021) have determined that the implementation of government subsidies
86 and increased awareness of crop insurance benefits could improve the agricultural sector and
87 help small farmers sustain their livelihoods. According to BIRTHAL et al. (2022), several
88 factors, including past exposure to climate shocks, resource availability, institutional credit
89 availability, and social safety nets for employment and food security, affect farmers' risk
90 management and adaptation decisions. Sreedaya and Suresh (2022) found that while most
91 farmers are interested in adopting crop insurance, lack of awareness and negative perceptions
92 regarding its guidelines, compensations, and delay in disbursement might be the reason for
93 their medium perception of it. Kramer et al. (2022) emphasized that the complex nature of
94 insurance products and low financial literacy contribute to low demand. Moreover,

95 subsistence-oriented farmers face additional challenges such as liquidity constraints and a lack
96 of trust and understanding.

97 3 Materials and methods

98 3.1 Study area and sampling

99 The survey was conducted in the Virudhunagar district of Tamil Nadu, a region known
100 for its challenging irrigation conditions due to low rainfall and limited access to reliable water
101 sources (Vikram et al., 2023). Only 57% of the area has access to guaranteed irrigation
102 through wells. The remaining 43% of the areas rely entirely on rain-fed tanks to sustain their
103 irrigation needs. The region primarily cultivates food crops such as paddy, maize, jowar,
104 bajra, and various pulses like horse gram, black gram, and green gram (Vikram et al., 2023).
105 Cotton represents the primary cash crop, predominantly cultivated during the rabi season,
106 encompassing an area of 11,740 hectares (Anonymous). Of the total cotton cultivation, 84%
107 occurs under rainfed conditions.

108 To accomplish the study objectives, an initial step involved the selection of five blocks,
109 namely Arruppukottai, Virudhunagar, Rajapalayam, Kariapatti, and Sattur, within the
110 Virudhunagar district. Utilizing a simple random sampling technique, seven villages were
111 chosen from each block, followed by the selection of ten farmers from each village. As a
112 result, a total sample size of 350 cotton farmers was obtained, of which 230 are insured and
113 120 are uninsured. The household survey questionnaire is developed based on input from key
114 informants and subsequently pre-tested with 20 farming households within the study area.
115 Following the pilot testing, feedback was integrated into the final version. A thorough survey
116 was undertaken using a properly structured questionnaire, during the period from mid-
117 September to mid-October 2022. In the survey, the researcher focused on interviewing heads
118 of households with significant farming expertise and the ability to make important financial
119 decisions. The questionnaire was subdivided into 3 sections: the socioeconomic background of
120 the respondents, farmers' awareness of PMFBY, and their perceptions of and experiences
121 with crop insurance. Notably, the perception inquiries were administered exclusively to those
122 respondents who had availed crop insurance in the previous season.

123 3.2 Empirical Methodology

124 The probit model is used to determine the influence of various socioeconomic factors
 125 on the farmers' awareness level about crop insurance scheme. The dependent variable is the
 126 awareness level of crop insurance, which is a dichotomous variable. The Probit regression
 127 model is specified as per Equation (1):

$$128 \quad Y_i = \alpha_i + \sum_{i=1}^m \beta_i X_i + \varepsilon_i \quad (1)$$

129 Where Y_i is the dependent variable which can be expressed as $Y = 1$ if a farmer has high
 130 awareness and 0 if a farmer has low awareness. X_i is a vector of independent variables,
 131 including gender, age, education, organisational membership, annual income, farm size,
 132 farming experience, livestock, access to credit, exposure to mass media, and contact with
 133 extension personnel. β_i is an unknown parameter that needs to be calculated and ε_i is an
 134 unobserved error term. STATA software (version 15.0) is used to conduct data analysis and
 135 run the probit regression model. Definition and explanation of all variables are given in Table
 136 1.

137 **Table 1. Description of the variables used in the probit model**

Variables	Explanation
Dependent variable	
Awareness level of crop insurance	1, if a farmer has a high awareness level and 0 for a low awareness level
Independent variables	
Gender	1 for male farmers and 0 for female farmers
Age	Age of the farmer in years
Education	Level of education (1 = no schooling, 2 = primary school, 3 = middle school, 4 = secondary school, 5 = higher secondary, 6 = graduate, 7 = postgraduate)
Organisational membership	1, if a farmer is a member of any organisation and 0 otherwise
Annual income	Logged value of the average annual income
Farm size	Size of the farm in acres
Farming experience	Number of years engaged in farming activities
Livestock	1 for holding livestock and 0 for otherwise
Access to credit	1 for access to credit; 0 otherwise
Exposure to mass media	0 – Low exposure, 1 – Medium exposure and 2 – High exposure
Contact with extension personnel	0 – Low extension agency contacts, 1 – Medium extension agency contacts, and 2 – High extension agency contacts

138 To quantify the degree of awareness among farmers, a comprehensive scale designed
 139 by Kurmi (2018), with minor modifications, is employed. The farmers' responses to
 140 statements concerning their awareness are methodically recorded on a three-point continuum
 141

142 scale: 'fully aware – 2', 'partially aware - 1', and 'not aware – 0'. Subsequently, the
 143 cumulative scores acquired are utilized to categorize the respondents into low and high levels
 144 of awareness. Finally, a score of 0 is assigned to respondents exhibiting low awareness, while
 145 a score of 1 is attributed to those demonstrating high awareness, for utilization in a probit
 146 model. Farmers' perception of crop insurance is evaluated using a 5-point Likert scale:
 147 Strongly Disagree - 1, Disagree - 2, Neutral - 3, Agree - 4, and Strongly Agree - 5. Further,
 148 ranking for each statement was determined based on the mean scores attained.

149 **4. Results and Discussion**

150 **4.1 Demographic and Farming Characteristics**

151 The average age of the sampled farmers is 49 years, with 84% of the total respondents
 152 being male, as shown in Table 2. The majority of respondents fall within the age group of 46
 153 to 55 years, boasting an average farming experience of 25 years. Findings show that the
 154 average education level of the respondents is at the middle school level. Notably, a small
 155 proportion (40%) of the farmers reported having organizational membership. Moreover, the
 156 distribution of average annual income among the respondents indicated that approximately
 157 50% of them fall into the medium income category, with earnings ranging between Rs.
 158 2,50,000 and Rs. 5,00,000. The mean farm size is found to be 5.7 acres approximately, with a
 159 maximum and minimum farm size of 30 acres and 1 acre, respectively. It is noteworthy that a
 160 considerable percentage of households are smallholders, with land sizes ranging from more
 161 than 2 to 4 acres.. Additionally, around 47% of the respondents reported holding livestock,
 162 and 60% of farmers had access to credit.

163 **Table 2. Descriptive statistics of socioeconomic characteristics of the respondents.**

Particulars	Frequency (n=350)	%	Mean	SD	Min	Max
Gender			0.84	0.37	0	1
Male	294	84.00				
Female	56	16.00				
Age			49.08	8.88	25	68
Up to 35	23	6.57				
36-45	106	30.29				
46-55	139	39.71				
56-65	72	20.57				
more than 65	10	2.86				
Education			2.88	1.42	1	7
No schooling	75	21.43				
Primary School	66	18.86				

Middle school	99	28.29				
Secondary	66	18.86				
Higher Secondary	26	7.43				
Graduate	16	4.57				
Post Graduate	2	0.57				
Membership in organisation			0.41	0.49	0	1
No	208	59.43				
Yes	142	40.57				
Annual income			474,423	247,745	120,000	2,600,000
Up to 50,000	0	0.00				
50,000 to 250,000	47	13.43				
250,000 to 500,000	176	50.29				
500,000 to 1,000,000	115	32.86				
More than 1,000,000	12	3.43				
Farm size (acres)			5.68	3.78	1	30
up to 2	25	7.14				
> 2 to 4	123	35.14				
> 4 to 6	111	31.71				
> 6 to 10	66	18.86				
> 10	25	7.14				
Farming Experience			25.51	11.57	1	51
Up to 5	15	4.29				
6 to 15	66	18.86				
16 to 30	170	48.57				
31 to 45	80	22.86				
More than 45	19	5.43				
Livestock			0.47	0.50	0	1
Yes	163	46.57				
No	187	53.43				
Access to credit			0.60	0.49	0	1
Yes	211	60.29				
No	139	39.71				

164 **4.2 Exposure to mass media and contact with extension personnel**

165 The data presented in Table 3 provides insights into the levels of exposure to mass
166 media and contact with extension personnel among the surveyed farmers. To assess the extent
167 of farmers' exposure to mass media, a scoring system is used that takes into account the
168 frequency of use of different media sources. Farmers are asked to indicate how often they use
169 each media source, with the options of Never (0), Occasional (1), or Regular (2). Similarly,
170 farmers are asked to rate the frequency of their contact with extension personnel as Never (0),
171 whenever a problem occurs (1), Weekly (2), or Monthly (3). Based on the total score
172 obtained, each variable is segmented into three categories: Low, Medium, and High. It is

173 evident that the majority of individuals fall within the low exposure category, with 50.29% of
 174 farmers demonstrating low exposure to mass media. Additionally, 38.29% of total
 175 respondents exhibit a moderate level of interaction with mass media, indicating sporadic
 176 rather than extensive engagement. Conversely, only 7.43% of farmers are classified as having
 177 high exposure to mass media, suggesting frequent and varied media consumption.

178 Regarding contact with extension personnel, the results show that 49.14% of the
 179 surveyed individuals had low contact. This indicates that a significant portion of the sample
 180 may not consistently engage with extension services, which may impact their access to
 181 agricultural knowledge and support. On the other hand, 32.29% of the sampled farmers
 182 demonstrated a moderate level of interaction, indicating intermittent rather than consistent
 183 contact with extension services. Only 15.54% of the farmers were actively engaged with
 184 extension personnel, likely benefiting from ongoing advice and support for their agricultural
 185 activities. Overall, the data indicated a greater number of individuals with low exposure to
 186 both mass media and extension personnel, potentially constraining their access to information
 187 and resources. Consequently, developing initiatives aimed at enhancing engagement with
 188 mass media and extension personnel could be beneficial for the farmers, encouraging them to
 189 more fully utilize these resources.

190 **Table3: Distribution of farmers according to their exposure to mass media and contact**
 191 **with extension personnel**

Particulars	Low	Medium	High
Exposure to mass media	190 (50.29)	134 (38.29)	26 (7.43)
Contact with extension personnel	172 (49.14)	113 (32.29)	53 (15.14)

192 Note: Numbers in parenthesis are percentages

193 4.3 Awareness level of crop insurance

194 Table 4 depicts the levels of awareness displayed by respondents with regard to
 195 various facets of the PMFBY. Each statement in Table 4 is segmented into 3 categories: "Not
 196 aware," "Partially aware," and "Fully aware", with corresponding scores of 0, 1, and 2
 197 assigned to each category, respectively. Notably, awareness levels vary across different
 198 aspects of PMFBY. Respondents appear to be more familiar with the premium amount and
 199 documentation process. However, they show less understanding of the procedures for claim
 200 settlement and crop loss assessment. Approximately 54% of the respondents were fully aware
 201 of the amount of premium to be paid, and 50% were fully aware of the documentation

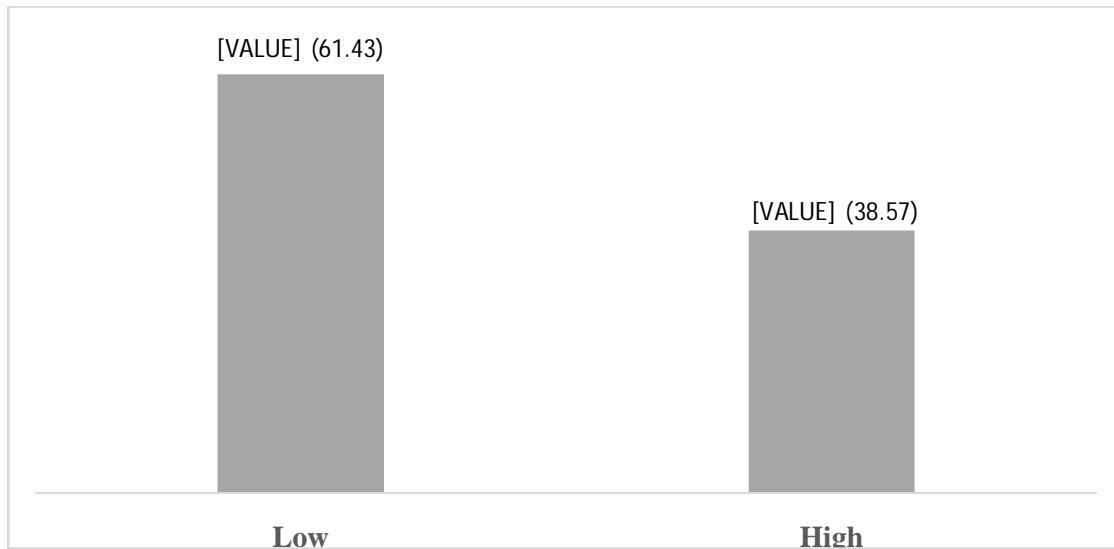
202 procedures required for insuring the crops. A considerable number of respondents have
 203 demonstrated partial awareness across aspects such as 'Extent of coverage of crops under
 204 PMFBY', 'Risks covered under PMFBY', 'Procedure of claim settlement', and 'Process of
 205 assessment of crop losses. This underscores the importance of targeted interventions to raise
 206 awareness among farmers and improve their access to information and resources regarding
 207 crop insurance.

208 **Table 4. Awareness of farmers regarding various aspects of PMFBY**

Particulars	Not aware	Partially aware	Fully aware
The extent of coverage of crops under PMFBY	63 (18.00)	182 (52.00)	105 (30.00)
Premium amount to be paid	57 (16.29)	105 (30.00)	188 (53.71)
Risks covered under PMFBY	79 (22.57)	204 (58.29)	67 (19.14)
Documentation process for insuring crops	68 (19.43)	107 (30.57)	175 (50.00)
The procedure of claim settlement	121 (34.57)	155 (44.29)	74 (21.14)
Process of assessment of crop loss	132 (37.71)	166 (47.43)	52 (14.86)

209 Note: Numbers in parenthesis are percentages

210 The data presented in Figure 1 illustrates the varying levels of awareness among the
 211 respondents, which have been categorized as "low" and "high" based on the overall scores
 212 derived from the statements in Table 4. The survey findings highlight that there is a
 213 significant lack of awareness about the PMFBY scheme among the majority of respondents
 214 (61.43%). This suggests the necessity for more extensive information dissemination and
 215 educational efforts to enhance awareness within this demographic. In contrast, a smaller
 216 percentage of respondents (38.57%) exhibit a high level of awareness.



217
218

Figure 1. The overall awareness level of PMFBY among farmers

219 **4.4 Results from the probit regression model**

220 The probit regression analysis is utilized to identify the determinants influencing
 221 farmers' awareness of PMFBY. Before running the probit model, an examination of
 222 multicollinearity among the variables is performed using VIF (Variance Inflation Factor) and
 223 Tolerance (TOL). The results in Table 5 demonstrate that VIF values below 5 indicate the
 224 absence of serious multicollinearity, suggesting that the data is reliable for further analysis.
 225 The probit model displayed substantial explanatory power, with a pseudo-R² value of 0.75.
 226 Furthermore, Table 6 illustrates the positive and significant impacts of variables such as
 227 education, organizational membership, exposure to mass media, and contact with extension
 228 personnel on farmers' awareness of PMFBY.

229 **Table 5. Multicollinearity diagnosis indices for explanatory variables**

Variable	VIF	1/VIF
Gender	1.08	0.92
Age	2.42	0.41
Education	1.41	0.71
Membership in the organisation	1.36	0.74
Annual income	1.69	0.59
Farm size	1.62	0.62
Farming experience	2.31	0.43
Livestock	1.04	0.96
Access to credit	1.07	0.93
Contact with extension personnel	1.62	0.62
Exposure to mass media	1.54	0.65
Mean VIF	1.56	

230 Education plays a critical role in raising awareness about crop insurance. Findings
 231 reveal an 8.2% increase in the likelihood of being aware of crop insurance with the increase
 232 in education level. This finding is supported by Kumar et al. (2011), Olila and Pambo (2014),
 233 Ghazanfar et al. (2015), and Saravanan and Ganesan (2022). This may be due to the reason
 234 that individuals with lower levels of education may face challenges in comprehending the
 235 intricacies and operational mechanisms of an insurance policy (Ghazanfar et al., 2015).
 236 Results show a significant positive association between organizational membership and
 237 awareness, with statistical significance at the 1% level. Moreover, active participation in
 238 social and community-based organizations, such as farmers' associations, self-help groups,
 239 and cooperative credit societies, increases the likelihood of awareness by 11.0%. This result is
 240 consistent with Kumar et al. (2011). Some studies suggest that utilizing social networks to
 241 disseminate information can have a substantial impact on the spread of crucial
 242 information (Banerjee et al., 2019; Cariappa et al., 2021). These findings emphasize the
 243 importance of promoting farmers' participation in social activities and highlight education as
 244 a fundamental tool for advancement.

245 Furthermore, it is found that farmers who frequently access information through
 246 various media channels exhibit a higher understanding of insurance programs compared to
 247 those with limited or no exposure. This result is found to be similar with Saravanan and
 248 Ganesan (2022). Correspondingly, farmers who engage in more frequent interactions with
 249 extension services demonstrate a more comprehensive understanding of insurance programs
 250 in comparison to those with irregular or no contacts. This is in line with findings by Saravanan
 251 and Ganesan (2022). This highlights the impactful role of mass media and direct interactions
 252 with extension agents in effectively delivering detailed and practical information,
 253 empowering farmers to better understand and actively participate in insurance programs.

254 **Table 6. Estimates of the probit model**

Variables	Coefficients	Standard error	Marginal effects	Standard error
Gender	0.004	0.326	0.001	0.050
Age	-0.007	0.018	-0.001	0.003
Education	0.538***	0.095	0.082***	0.012
Membership in the organisation	0.716***	0.213	0.110***	0.031
Annual income	0.199	0.300	0.031	0.046
Farm size	0.017	0.033	0.003	0.005
Farming experience	0.003	0.013	0.001	0.002
Livestock	-0.223	0.212	-0.034	0.032

Access to credit	0.210	0.225	0.032	0.034
Exposure to mass media	0.832***	0.193	0.128***	0.027
Contact with extension personnel	1.078***	0.165	0.165***	0.019
Constant	-6.036	3.855		

Summary statistics

Log-likelihood	= -97.51
LR Chi ²	= 271.74
Pro>chi ²	= 0.0000
Pseudo R ²	= 0.58
Number of observations	= 350

255 Note: ***, **, and * indicate significance levels of 1%, 5% and 10%, respectively.

256 4.5 Perception of farmers about crop insurance

257 The data presented in Table 7 illustrates the farmers' perspectives on various aspects
 258 of crop insurance. Upon identifying the farmers within the sample population who have
 259 availed crop insurance, participants were asked to rate the predetermined items regarding
 260 their perception of crop insurance using a five-point Likert scale (Strongly Disagree -
 261 1, Disagree - 2, Neutral - 3, Agree - 4, Strongly Agree - 5). The results highlight three main
 262 concerns of PMFBY among farmers: delayed claim settlements, inadequate compensation
 263 compared to actual loss, and non-affordable premium rates, with mean scores of 4.29, 3.86,
 264 and 3.77, respectively.

265 While the premium rates are subsidized and have been further reduced in the newly
 266 introduced PMFBY, farmers still find the premium rates to be relatively high. This perception
 267 may stem from the fact that even with the subsidized premiums, the costs could still pose a
 268 significant burden for small and marginal farmers (Rajeev & Nagendran, 2023). Furthermore,
 269 farmers have articulated concerns regarding the limitations of the current area-based
 270 approach for estimating crop loss assessment. They have underscored that this methodology
 271 often disregards individual crop losses, leading to insufficient compensation for the actual
 272 extent of their losses. Some studies such as Ghimire et al. (2016), Johnson et al. (2019), and
 273 Budhathoki et al. (2019) have indicated that discrepancies between claimed amounts and
 274 actual losses may also contribute to the low adoption of crop insurance.

275 **Table 7. Perception of farmers about crop insurance**

Particulars	Mean score	Rank
Crop insurance acts as a risk management tool	3.16	V
Amount of premium is not affordable	3.77	III
Availing of crop insurance is a more time-consuming process	2.87	VIII
Helps in providing financial support during crop losses	3.10	VI
Helps to adopt innovative and modern farm practices	2.40	IX

Need to ensure quick settlement of claims	4.29	I
Timely conducting of crop-cutting experiments	2.95	VII
The amount of compensation is less compared to the actual loss that occurred	3.86	II
Loss assessment should be based on an individual farm approach, not on an area-based approach	3.34	IV

276 5. Conclusion and recommendations

277 Crop insurance remains an integral component within the agricultural frameworks of
278 developing nations, serving as a primary instrument in the stabilization of farm income and
279 the mitigation of risks inherent to agricultural activities. However, the adoption of agricultural
280 insurance products among farmers in India has been limited, as evidenced by their reluctance
281 to invest in insurance coverage (Rajeev & Nagendran, 2023). This study seeks to ascertain the
282 extent of farmers' understanding of insurance, analyse the factors influencing their awareness,
283 and explore their perceptions of crop insurance. The outcomes of the study indicate that the
284 majority of the farmers have limited exposure to mass media and minimal contact with
285 extension personnel. Specifically, only 7.43% of farmers have high mass media exposure
286 with 15.14% of farmers demonstrating high extension contacts. In addition, results show
287 that 61.43% of the respondents have low awareness of various aspects of PMFBY while
288 38.57% have relatively high awareness.

289 Probit model results show that education, membership in the organisation, mass
290 media exposure, and contact with extension personnel have a significant positive influence on
291 the awareness level of crop insurance. However, it is noteworthy that the level of education,
292 mass media exposure, and extension contacts is notably low among sampled farmers and
293 only 40% of the respondents are members of the organisation. Therefore, it is recommended to
294 prioritize the cultivation and strengthening of relationships between farmers and extension
295 agents to effectively propagate heightened awareness regarding crop insurance amongst
296 farmers. One approach is to develop extension networks funded by training individuals from
297 local communities in insurance. The private insurance sector can also be encouraged to utilize
298 the public extension system to reduce costs and improve trust in insurance
299 products. Additionally, involving grassroots organizations, such as self-help groups and rural
300 cooperatives, which possess extensive experience in collaborating with farmers, can
301 substantially facilitate the dissemination of comprehensive information about crop insurance.
302 Furthermore, it is important to conduct awareness campaigns to educate farmers about the
303 benefits and functioning of crop insurance.

304 The findings on the perception of crop insurance among insured farmers reveal that
305 many of them harbour negative views about the insurance program. The primary concerns of
306 the respondents include late settlement of claims, inadequate compensation, and unaffordable
307 premium rates. It is crucial to take action to ensure that indemnity payments are made
308 promptly when farmers suffer losses. Additionally, it is recommended to employ advanced
309 technologies, such as satellite imagery or drones, to swiftly assess crop damage and provide
310 compensation amounts that accurately reflect the actual loss. By addressing these issues and
311 tailoring crop insurance to meet the needs of farmers in developing countries, there could be a
312 significant increase in demand for crop insurance.

313 **Disclaimer (Artificial intelligence)**

314 Author(s) hereby declare that NO generative AI technologies such as Large Language
315 Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during the
316 writing or editing of manuscripts.

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