



***The World's Largest Open Access Agricultural & Applied Economics Digital Library***

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from AgEcon Search may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

*No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.*



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

**Reddyprasanna Diyyala <sup>a\*</sup>, N Venkatesa Palanichamy <sup>b\*</sup>, D Murugananthi <sup>c</sup>, V Geethalakshmi <sup>d</sup> and M Rajavel <sup>d</sup>**

<sup>a</sup> Agricultural and Rural Management, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu - 641003, India.

<sup>b</sup> Agricultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu - 641003, India.

<sup>c</sup> Directorate of Agribusiness Development, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu - 641003, India.

<sup>d</sup> Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu - 641003, India.

## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

## **Article Information**

DOI: <https://doi.org/10.9734/ajaees/2024/v42i92538>

**Open Peer Review History:**  
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/122263>

**Received: 18/06/2024**

**Accepted: 24/08/2024**

**Published: 01/09/2024**

**Original Research Article**

## **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

\*Corresponding author: E-mail: [diyyalaredyprasanna@gmail.com](mailto:diyyalaredyprasanna@gmail.com), [nvpchamy@tnau.ac.in](mailto:nvpchamy@tnau.ac.in);

**Cite as:** Diyyala, Reddyprasanna, N Venkatesa Palanichamy, D Murugananthi, V Geethalakshmi, and M Rajavel. 2024. "Determinants of Farmers' Awareness and Perspectives on Pradhan Mantri Fasal Bima Yojana in Southern Tamil Nadu, India". Asian Journal of Agricultural Extension, Economics & Sociology 42 (9):26-38. <https://doi.org/10.9734/ajaees/2024/v42i92538>.

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 that education, organizational membership, mass media exposure, and extension contacts have a positive influence on 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; natural disasters.

## 1. INTRODUCTION

Agriculture is a vital income source in many developing countries, including India. In this nation, about 60% of the population depends on farming for their livelihood [1-3]. However, Indian farmers encounter significant agricultural challenges due to the unpredictability of natural events [4-6,3]. Small and marginal farmers, who constitute around 80% of the agricultural community, are particularly susceptible to the high risks associated with crop production [7,2]. The frequent failure of crops can lead to farmers accruing significant debt, adversely affecting both agriculture and the farm economy [8]. Therefore, it is essential to implement effective strategies to stabilize and protect the agricultural sector [9]. One of the most promising solutions to address these challenges is crop insurance, which has been recognized as a vital tool for managing agricultural risks [10,5,11,12]. Crop insurance allows farmers to protect their livelihoods against natural disasters such as droughts, floods, cyclones, hailstorms, pest infestations, and diseases [5]. Additionally, it promotes a sense of self-reliance and dignity among farmers, as it provides them with the right to claim compensation in the event of crop loss, thus mitigating the financial impact of unforeseen natural events [13].

Despite being introduced in 1972, crop insurance in India has faced numerous challenges [5]. Over the years, these schemes have seen various modifications aimed at improving claims processing, premium rates, and other key aspects [14]. In response to the limitations of previous insurance systems, the Government of India launched the PMFBY in the Kharif season of 2016 [5]. Indian crop insurance programs are known for their broad coverage among farmers. However, India still has the largest population of

uninsured farmers globally [15]. Although there is significant research and implementation in the field of agricultural insurance, there remains ambiguity regarding the extent to which farmers prefer this method over other risk management strategies [16]. Despite the attractive terms and low prices, only a few farmers purchase insurance under the new PMFBY policy framework [15,16]. Therefore, it is crucial to analyze the factors contributing to this low popularity, given the significant role of the insurance program in supporting India's agrarian economy [15].

Within this context, our study is focused on three main objectives: i) To understand the level of farmers' knowledge of crop insurance, ii) To analyze the factors influencing their awareness of crop insurance, and iii) To examine the perceptions of insured farmers regarding crop insurance. This study contributes to the existing literature by identifying which features of crop insurance are most important to farmers. Additionally, the study identifies factors that hinder farmers' awareness of crop insurance. By improving farmers' understanding of crop insurance and addressing their knowledge gaps, the demand for crop insurance can be increased.

Furthermore, the study explores insured farmers' perceptions of crop insurance, providing insights that can help policymakers make necessary adjustments to existing policies, thereby enhancing their overall efficiency and effectiveness.

## 2. REVIEW OF LITERATURE

Determining the demand for crop insurance is challenging worldwide, with low adoption in developing countries [16]. The complexity in these countries arises from government interventions to stabilize farm incomes through

various means like quotas, price support systems, subsidies, and low-interest loans [16,17] Singh and Agrawal [18] found that limited access to agricultural insurance is mainly due to farmers' lack of understanding about insurance and their preference for relief payments. The current crop insurance plans are not working well due to state-level issues. The study by Basir et al. [19] revealed a significant and positive connection between farmers' risk attitudes and the size of their farms, with farmers' awareness of crop insurance serving as the dependent variable. Ghosh et al. [16] suggested that understanding which parts of crop insurance matter most to farmers can help improve existing policies.

Islam et al. [20] have determined that the implementation of government subsidies and increased awareness of crop insurance benefits could improve the agricultural sector and help small farmers sustain their livelihoods. According to Birthal et al. [21] several factors, including past exposure to climate shocks, resource availability, institutional credit availability, and social safety nets for employment and food security, affect farmers' risk management and adaptation decisions. Sreedaya and Suresh [22] found that while most farmers are interested in adopting crop insurance, lack of awareness and negative perceptions regarding its guidelines, compensations, and delay in disbursement might be the reason for their medium perception of it. Kramer et al. [23] emphasized that the complex nature of insurance products and low financial literacy contribute to low demand. Moreover, subsistence-oriented farmers face additional challenges such as liquidity constraints and a lack of trust and understanding.

### 3. MATERIALS AND METHODS

#### 3.1 Study Area and Sampling

The survey was conducted in the Virudhunagar district of Tamil Nadu, a region known for its challenging irrigation conditions due to low rainfall and limited access to reliable water sources [24]. Only 57% of the area has access to guaranteed irrigation through wells. The remaining 43% of the areas rely entirely on rain-fed tanks to sustain their irrigation needs. The region primarily cultivates food crops such as paddy, maize, jowar, bajra, and various pulses like horse gram, black gram, and green gram [24]. Cotton represents the primary cash crop,

predominantly cultivated during the rabi season, encompassing an area of 11,740 hectares (Anonymous). Of the total cotton cultivation, 84% occurs under rainfed conditions.

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

#### 3.2 Empirical Methodology

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

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

Where  $Y_i$  is the dependent variable which can be expressed as  $Y = 1$  if a farmer has high awareness and 0 if a farmer has low awareness.  $X_i$  is a vector of independent variables, including gender, age, education, organisational membership, annual income, farm size, farming experience, livestock, access to credit, exposure to mass media, and contact with extension

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

| Variables                         | Explanation  |
|-----------------------------------|--|
| <b>Dependent variable</b>         |  |
| Awareness level of crop insurance | 1, if a farmer has a high awareness level and 0 for a low awareness level  |
| <b>Independent variables</b>      |  |
| 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  |

personnel.  $\beta_i$  is an unknown parameter that needs to be calculated and  $\varepsilon_i$  is an unobserved error term. STATA software (version 15.0) is used to conduct data analysis and run the probit regression model. Definition and explanation of all variables are given in Table 1.

To quantify the degree of awareness among farmers, a comprehensive scale designed by Kurmi [25] with minor modifications, is employed. The farmers' responses to statements concerning their awareness are methodically recorded on a three-point continuum scale: 'fully aware – 2', 'partially aware - 1', and 'not aware – 0'. Subsequently, the cumulative scores acquired are utilized to categorize the respondents into low and high levels of awareness. Finally, a score of 0 is assigned to respondents exhibiting low awareness, while a score of 1 is attributed to those demonstrating high awareness, for utilization in a probit model. Farmers' perception of crop insurance is evaluated using a 5-point Likert scale: Strongly Disagree - 1, Disagree - 2, Neutral - 3, Agree - 4, and Strongly Agree - 5. Further, ranking for each statement was determined based on the mean scores attained.

## 4. RESULTS AND DISCUSSION

### 4.1 Demographic and Farming Characteristics

The average age of the sampled farmers is 49 years, with 84% of the total respondents being

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

### 4.2 Exposure to Mass Media and Contact with Extension Personnel

The data presented in Table 3 provides insights into the levels of exposure to mass media and contact with extension personnel among the surveyed farmers. To assess the extent of farmers' exposure to mass media, a scoring system is used that takes into account the frequency of use of different media sources.

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

| <b>Particulars</b>                | <b>Frequency (n=350)</b> | <b>%</b> | <b>Mean</b> | <b>SD</b> | <b>Min</b> | <b>Max</b> |
|-----------------------------------|--------------------------|----------|-------------|-----------|------------|------------|
| <b>Gender</b>                     |                          | 0.84     | 0.37        | 0         | 1          |            |
| Male                              | 294                      | 84.00    |             |           |            |            |
| Female                            | 56                       | 16.00    |             |           |            |            |
| <b>Age</b>                        |                          | 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     |             |           |            |            |
| <b>Education</b>                  |                          | 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     |             |           |            |            |
| <b>Membership in organisation</b> |                          | 0.41     | 0.49        | 0         | 1          |            |
| No                                | 208                      | 59.43    |             |           |            |            |
| Yes                               | 142                      | 40.57    |             |           |            |            |
| <b>Annual income</b>              |                          | 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     |             |           |            |            |
| <b>Farm size (acres)</b>          |                          | 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     |             |           |            |            |

| <b>Particulars</b>        | <b>Frequency (n=350)</b> | <b>%</b> | <b>Mean</b> | <b>SD</b> | <b>Min</b> | <b>Max</b> |
|---------------------------|--------------------------|----------|-------------|-----------|------------|------------|
| <b>Farming Experience</b> |                          |          | 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     |             |           |            |            |
| <b>Livestock</b>          |                          | 0.47     | 0.50        | 0         | 1          |            |
| Yes                       | 163                      | 46.57    |             |           |            |            |
| No                        | 187                      | 53.43    |             |           |            |            |
| <b>Access to credit</b>   |                          | 0.60     | 0.49        | 0         | 1          |            |
| Yes                       | 211                      | 60.29    |             |           |            |            |
| No                        | 139                      | 39.71    |             |           |            |            |

Farmers are asked to indicate how often they use each media source, with the options of Never (0), Occasional (1), or Regular (2). Similarly, farmers are asked to rate the frequency of their contact with extension personnel as Never (0), whenever a problem occurs (1), Weekly (2), or Monthly (3). Based on the total score obtained, each variable is segmented into three categories: Low, Medium, and High. It is evident that the majority of individuals fall within the low exposure category, with 50.29% of farmers demonstrating low exposure to mass media. Additionally, 38.29% of total respondents exhibit a moderate level of interaction with mass media, indicating sporadic rather than extensive engagement. Conversely, only 7.43% of farmers are classified as having high exposure to mass media, suggesting frequent and varied media consumption.

Regarding contact with extension personnel, the results show that 49.14% of the surveyed individuals had low contact. This indicates that a significant portion of the sample may not consistently engage with extension services, which may impact their access to agricultural knowledge and support. On the other hand, 32.29% of the sampled farmers demonstrated a moderate level of interaction, indicating intermittent rather than consistent contact with extension services. Only 15.54% of the farmers were actively engaged with extension personnel, likely benefiting from ongoing advice and support for their agricultural activities. Overall, the data indicated a greater number of individuals with low exposure to both mass media and extension personnel, potentially constraining their access to information and resources. Consequently, developing initiatives aimed at enhancing engagement with mass media and extension personnel can make farmers better use of these resources.

### 4.3 Awareness Level of Crop Insurance

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

assessment. Approximately 54% of the respondents were fully aware of the amount of premium to be paid, and 50% were fully aware of the documentation procedures required for insuring the crops. A considerable number of respondents have demonstrated partial awareness across aspects such as 'Extent of coverage of crops under PMFBY', 'Risks covered under PMFBY', 'Procedure of claim settlement', and 'Process of assessment of crop losses. This underscores the importance of targeted interventions to raise awareness among farmers and improve their access to information and resources regarding crop insurance.

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

### 4.4 Results from the Probit Regression Model

The probit regression analysis is utilized to identify the determinants influencing farmers' awareness of PMFBY. Before running the probit model, an examination of multicollinearity among the variables is performed using VIF (Variance Inflation Factor) and Tolerance (TOL). The results in Table 5 show that VIF values are below 5, indicating the absence of serious multicollinearity. This suggests that the data is reliable for further analysis. The probit model displayed substantial explanatory power, with a pseudo-R<sup>2</sup> value of 0.75. Furthermore, Table 6 illustrates the positive and significant impacts of variables such as education, organizational membership, exposure to mass media, and contact with extension personnel on farmers' awareness of PMFBY.

Education plays a critical role in raising awareness about crop insurance. Findings reveal an 8.2% increase in the likelihood of being aware of crop insurance with the increase in education level. This finding is supported by Kumar et al. [13] Olila and Pambo [26] Ghazanfar et al. [27] and Saravanan and Ganesan [28]. This may be

due to the reason that individuals with lower levels of education may face challenges in comprehending the intricacies and operational mechanisms of an insurance policy [27]. Results show a significant positive association between organizational membership and awareness, with statistical significance at the 1% level. Moreover, active participation in social and community-based organizations, such as farmers' associations, self-help groups, and cooperative

credit societies, increases the likelihood of awareness by 11.0%. This result is consistent with Kumar et al. [13] Some studies suggest that utilizing social networks to disseminate information can have a substantial impact on the spread of crucial information [29,30]. These findings emphasize the importance of promoting farmers' participation in social activities and highlight education as a fundamental tool for advancement.

**Table 3. Distribution of farmers according to their exposure to mass media and contact with extension personnel**

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

*Note: Numbers in parenthesis are percentages*

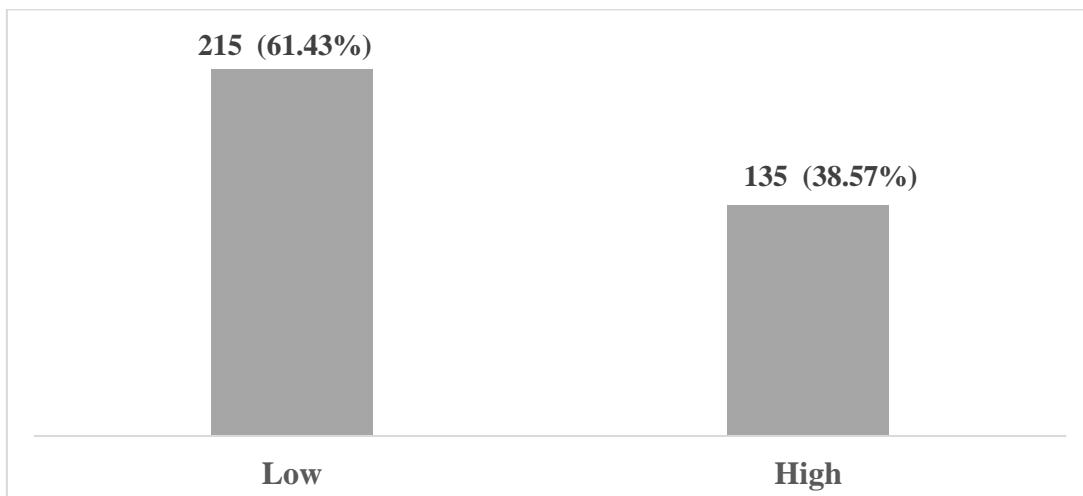
**Table 4. Awareness of farmers regarding various aspects of PMFBY**

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

*Note: Numbers in parenthesis are percentages*

**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 |       |



**Fig. 1. The overall awareness level of PMFBY among farmers**

**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          |                  |                |
| <b>Summary statistics</b>        |              |                |                  |                |
| Log-likelihood                   | = -97.51     |                |                  |                |
| LR Chi <sup>2</sup>              | = 271.74     |                |                  |                |
| Pro>chi <sup>2</sup>             | = 0.0000     |                |                  |                |
| Pseudo R <sup>2</sup>            | = 0.58       |                |                  |                |
| Number of observations           | = 350        |                |                  |                |

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

**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       | 1V   |

Furthermore, it is found that farmers who frequently access information through various media channels exhibit a higher understanding of insurance programs compared to those with limited or no exposure. This result is found to be similar to Saravanan and Ganesan [28]. Correspondingly, farmers who engage in more frequent interactions with extension services demonstrate a more comprehensive understanding of insurance programs in comparison to those with irregular or no contacts. This is in line with the findings by Saravanan and Ganesan [28]. This highlights the impactful role of mass media and direct interactions with extension agents in effectively delivering detailed and practical information, empowering farmers to better understand and actively participate in insurance programs.

#### 4.5 Perception of Farmers about Crop Insurance

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

While the premium rates are subsidized and have been further reduced in the newly introduced PMFBY, farmers still find the premium rates to be relatively high. This perception may stem from the fact that even with the subsidized premiums, the costs could still pose a significant burden for small and marginal farmers [2]. Furthermore, farmers have articulated concerns regarding the limitations of the current area-based approach for estimating crop loss assessment. They have underscored that this methodology often disregards individual crop losses, leading to insufficient compensation for the actual extent of their losses. Some studies such as Ghimire et al. [31] Johnson et al. [32,33] and Budhathoki et al. [4] have indicated that discrepancies between claimed amounts and actual losses may also contribute to the low adoption of crop insurance.

#### 5. CONCLUSION AND RECOMMENDATIONS

Crop insurance remains an integral component within the agricultural frameworks of developing nations, serving as a primary instrument in the stabilization of farm income and the mitigation of risks inherent to agricultural activities. However, the adoption of agricultural insurance products among farmers in India has been limited, as evidenced by their reluctance to invest in insurance coverage [2]. This study seeks to ascertain the extent of farmers' understanding of insurance, analyse the factors influencing their awareness, and explore their perceptions of crop insurance. The outcomes of the study indicate that the majority of the farmers have limited exposure to mass media and minimal contact with extension personnel. Specifically, only 7.43% of farmers have high mass media exposure with 15.14% of farmers demonstrating high extension contacts. In addition, results show that 61.43% of the respondents have low awareness of various aspects of PMFBY while 38.57% have relatively high awareness.

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

The findings on the perception of crop insurance among insured farmers reveal that many of them

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

## DISCLAIMER (ARTIFICIAL INTELLIGENCE)

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

## ACKNOWLEDGMENTS

We would like to express our gratitude to V. Bala Murugan, A. Suresh, and P. Saradha for their help in data collection.

## COMPETING INTERESTS

The authors have declared that no competing interests exist.

## REFERENCES

1. MoA, FW. Annual report. Department of Agriculture & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India, Krishi Bhawan, New Delhi-110 001; 2024.
2. Rajeev M, Nagendran P. Protecting land and livelihood under climate risks: What hinders crop insurance adoption? . Land use Policy. 2023;131:1-10.
3. Sundar J, Ramakrishnan L. A study on awareness, purchase benefits and satisfaction level towards crop insurance. Pacific Business Review International. 2015;7(11):38-45.
4. Budhathoki NK, Lassa JA, Pun S, Zander KK. Farmers' interest and willingness-to-pay for index-based crop insurance in the lowlands of Nepal. Land use policy. 2019;85:1-10.
5. Gulati A, Terway P, Hussain S. Crop insurance in India: Key issues and way forward. Working Paper No. 352, Indian Council for Research on International Economic Relations (ICRIER), New Delhi; 2018.
6. Senapati AK. Insuring against climatic shocks: Evidence on farm households' willingness to pay for rainfall insurance product in rural India. International Journal of Disaster Risk Reduction. 2020;42: 101351.
7. Aditya K, Kishore A, Khan T. Exploring farmers' willingness to pay for crop insurance products: A case of weather-based crop insurance in Punjab India. Agricultural Economics Research Review. 2020;33(2):135-146.
8. Singh, G. Crop insurance in India. Indian Institute of Management, Ahmedabad; 2010.
9. Karthick V, Mani K. Factors affecting crop insurance adoption decisions by farmers in Tamil Nadu. Agriculture Update. 2013;8: 399-401.
10. Fahad, S., & Jing, W. (2018). Evaluation of Pakistani farmers' willingness to pay for crop insurance using contingent valuation method: The case of Khyber Pakhtunkhwa province. Land use policy, 72, 570-577.
11. Hossain, M. S., Alam, G. M., Fahad, S., Sarker, T., Moniruzzaman, M., & Rabbani, M. G. (2022). Smallholder farmers' willingness to pay for flood insurance as climate change adaptation strategy in northern Bangladesh. Journal of Cleaner Production, 338, 130584.
12. Venkatesh G. Crop insurance in India: A study. Journal of the Insurance Institute of India. 2008;4: 15-17.
13. Kumar DS, Barah B, Ranganathan C, Venkatram R, Gurunathan S, Thirumoorthy S. An analysis of farmers' perception and awareness towards crop insurance as a tool for risk management in Tamil Nadu. Agricultural Economics Research Review. 2011;24(1):37-46.
14. Kaur S, Raj H, Singh H, Chattu VK. Crop insurance policies in India: An empirical analysis of Pradhan Mantri

Fasal Bima Yojana. Risks. 2021;9(11):191.

15. Aditya K, Khan T, Kishore A. Adoption of crop insurance and impact: insights from India. Agricultural Economics Research Review. 2018;31(2):163-17.

16. Ghosh RK, Gupta S, Singh V, Ward PS. Demand for crop insurance in developing countries: New evidence from India. Journal of Agricultural Economics. 2021;72(1):293-320.

17. Mensah NO, Owusu-Sekyere E, Adjei C. Revisiting preferences for agricultural insurance policies: Insights from cashew crop insurance development in Ghana. Food Policy. 2023;118:102496.

18. Singh P, Agrawal G. Development, present status and performance analysis of agriculture insurance schemes in India: Review of evidence. International Journal of Social Economics. 2020;47(4):461-481.

19. Basir FAM, Roslan A, Zakaria NNB, Ooi NQBMN, Anggraini RJIM, Review B. Determinants of Smallholder Farmers' Awareness of Crop Insurance in Kedah, Malaysia. 2024;16(1(I)S):229-237.

20. Islam DI, Rahman A, Sarker MSR, Luo J, Liang H. Factors affecting farmers' willingness to adopt crop insurance to manage disaster risk: evidence from Bangladesh. International Food and Agribusiness Management Review. 2021;24(3):463-479.

21. Birthal PS, Hazrana J, Negi DS, Mishra AK. Assessing benefits of crop insurance vis-a-vis irrigation in Indian agriculture. Food Policy. 2022;112:102348.

22. Sreedaya G, Suresh N. Perception of farmers towards crop insurance schemes in Kerala, India. Asian Journal of Agricultural Extension, Economics Sociology. 2022;40(1):437-447.

23. Kramer B, Hazell P, Alderman H, Ceballos F, Kumar N, Timu AG. Is agricultural insurance fulfilling its promise for the developing world? A review of recent evidence. Annual Review of Resource Economics. 2022;14(1):291-311.

24. Vikram K, Meghanatha R, Hariharadhas B, K. Sakaravel P. District Statistical Handbook 2021-22. Department of Economics and Statistics, Virudhunagar; 2023.

Accessed on 03 June 2024.  
Available: <https://cdn.s3waas.gov.in/s3c86a7ee3d8ef0b551ed58e354a836f2b/uploads/2023/01/2023010298.pdf>.

25. Kurmi J. Farmers' perception towards Pradhan Mantri Fasal Bima Yojana (PMFBY) at Rewa block of Rewa district (M.P.). Master's Dissertation, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur]; 2018.

26. Olila DO, Pambo KO. Determinants of farmers' awareness about crop insurance: Evidence from Trans-Nzoia County, Kenya. Selected paper prepared for oral presentation at the 8th Annual Egerton University International Conference: 26th – 28th March; 2014.

27. Ghazanfar S, Qi-wen Z, Abdullah M, Ahmad Z, Lateef M. Farmers' perception and awareness and factors affecting awareness of farmers regarding crop insurance as a risk coping mechanism evidence from Pakistan. Journal of Northeast Agricultural University. 2015; 22(1):76-82.

28. Saravanan A, Ganesan R. Farmers' awareness and perceptions of crop insurance in erode district, Tamil Nadu. YMER. 2022;21:1875-1881.

29. Banerjee A, Chandrasekhar AG, Duflo E, Jackson MO. Using gossips to spread information: Theory and evidence from two randomized controlled trials. The Review of Economic Studies. 2019;86(6):2453-2490.

30. Cariappa AA, Mahida DP, Lal P, Chandel B. Correlates and impact of crop insurance in India: evidence from a nationally representative survey. Agricultural Finance Review. 2021;81(2):204-221.

31. Ghimire YN, Timsina KP, Gauchan D. Risk management in agriculture: Global experiences and lessons for Nepal. Nepal Agricultural Research Council, Socioeconomics and Agricultural Policy Research Division, Lalitpur, Nepal; 2016.

32. Johnson L, Wandera B, Jensen N, Banerjee R. Competing expectations in an index-based livestock insurance project. The Journal of Development Studies. 2019;55(6):1221-1239.

33. Anonymous. Season and Crop Report 2022-23. Department of Economics and Statistics, Government of Tamil Nadu. Accessed on:10 June 2024. Available:<https://www.tn.gov.in/crop/areaundernonfoodcrops.pdf>.

**Disclaimer/Publisher's Note:** The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of the publisher and/or the editor(s). This publisher and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.

© Copyright (2024): Author(s). The licensee is the journal publisher. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*

*The peer review history for this paper can be accessed here:*

<https://www.sdiarticle5.com/review-history/122263>