

Awareness and Adaptation of Crop-Insurance Among Marginal Farmers in Tamil Nadu

Miruthulaa VG¹, Dr Swapna H R²

¹USN No: 24MCRMC001, M.Com (SKD),

Project Trainee, School of Commerce,

JAIN Deemed-to-be University, Bangalore-560 069, Karnataka, India

²Professor, School of Commerce-PG Studies

Jain (Deemed to be) University, Bangalore, Karnataka, India

drswapnahr[at]gmail.com

Abstract: Agriculture in India continues to be exposed to climatic variability, pest outbreaks, and price fluctuations, creating chronic uncertainty for millions of small and marginal farmers. Crop-insurance schemes have been promoted as key risk-mitigation tools, yet their impact depends on how well farmers understand and use them. This study examines the awareness and adaptation behaviour of marginal farmers in Tamil Nadu, analysing socio-economic and institutional determinants through field data from 186 respondents in Thanjavur, Coimbatore, Erode, and Villupuram. Descriptive statistics, correlation, multiple regression, and logistic regression were applied using SPSS v25. Results reveal moderate awareness (index 0.63), adaptation (0.57), institutional support (0.62), and satisfaction (0.60). Education, extension contact, credit access, and institutional trust significantly influence awareness, while awareness itself is the strongest predictor of adaptation. Delayed claim settlement and complex documentation remain the main obstacles. Strengthening extension, simplifying procedures, and improving transparency are crucial for enhancing crop-insurance performance and rural resilience.

Keywords: Crop insurance, marginal farmers, awareness, adaptation behaviour, extension contact, institutional trust, Tamil Nadu, agricultural risk management

1.Introduction

Agriculture remains a critical pillar of India's economy and rural livelihoods. Yet climatic instability, pest infestations, and market volatility impose severe production risks. Marginal farmers-owning less than one hectare-bear the greatest vulnerability due to limited capital and weak institutional access. Crop-insurance was designed to protect such farmers from catastrophic loss, but actual enrolment and claim utilisation remain low. In Tamil Nadu, despite the presence of the Pradhan Mantri Fasal Bima Yojana (PMFBY), participation rates are modest. This study explores how far marginal farmers are aware of crop-insurance provisions and to what extent this awareness translates into effective adaptation and continued participation.

2.Objectives and Significance

The research pursued five interlinked objectives:

- 1.To assess the level of awareness of crop-insurance schemes among marginal farmers in Tamil Nadu.
- 2.To examine the extent of adaptation behaviour-enrolment, renewal, claim use, and continuation intent.
- 3.To identify socio-economic and institutional factors influencing awareness and adaptation.
- 4.To evaluate farmers' satisfaction with crop-insurance services.
- 5.To propose operational and policy measures for improving outreach and participation.

The study contributes empirically to the limited Tamil Nadu-specific literature on the awareness-adaptation linkage and offers practical insights for government

agencies and insurance operators implementing PMFBY and related schemes.

3.Review of Literature

Crop-insurance in India evolved from early pilot initiatives in the 1970s to successive nationwide programmes-the Comprehensive Crop Insurance Scheme (1985), National Agricultural Insurance Scheme (1999), and PMFBY (2016). Although design improvements reduced premium costs and introduced digital claim assessment, coverage still remains below one-third of the gross cropped area (Chand, 2019). Studies by Mahul and Stutley (2010), Mukherjee and Pal (2019) and Rajeev (2022) emphasise that low awareness, procedural delays, and inadequate institutional trust are persistent deterrents. Tamil Nadu studies (Uvaneswaran & Mohanapriya 2014; Kumar & Devi 2021) further show that farmers often confuse crop-insurance with government relief, indicating superficial understanding. Factors such as education, farm size, credit access, and extension contact are repeatedly identified as significant determinants of adoption (Rao et al., 2020). This study integrates these behavioural, socio-economic, and institutional dimensions within a single analytical framework.

4.Methodology

A descriptive-analytical design was used to combine factual description with quantitative analysis. Four districts-Thanjavur (delta irrigated), Coimbatore (western mixed), Erode (semi-irrigated horticultural), and Villupuram (rain-fed semi-arid)-were purposively selected to represent Tamil Nadu's agro-ecological diversity.

A multi-stage stratified random sample produced 200 respondents, of which 186 valid schedules were analysed. Primary data were gathered through a structured bilingual interview schedule covering socio-economic characteristics, awareness, adaptation, institutional support, and satisfaction. Composite indices (0–1 scale) were computed for each dimension.

Statistical tools: descriptive statistics, chi-square, correlation, multiple regression (for awareness determinants), logistic regression (for adaptation), mean-score ranking (for satisfaction), and Garrett's ranking (for constraints). Cronbach's α exceeded 0.70 for all indices, confirming internal consistency.

5. Results and Discussion

5.1 Socio-Economic Characteristics of Respondents

Among the 186 respondents, 74.7 per cent were male and 47.8 per cent were in the age group 36–50 years. Over two-thirds had attained at least secondary education, and 53 per cent cultivated less than 0.5 hectare of land. The majority earned between ₹ 1 lakh and ₹ 2 lakh annually. These figures portray a population that is moderately literate but financially constrained, underscoring their vulnerability to crop failure and their dependence on institutional support.

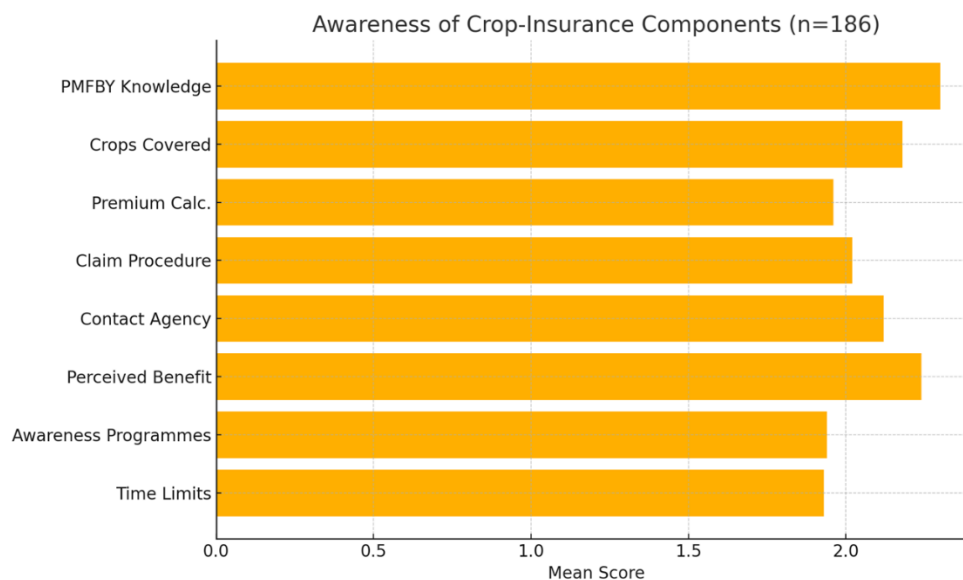
5.2 Awareness of Crop-Insurance

Understanding the level of awareness among marginal farmers is fundamental to analysing how effectively crop-insurance schemes are reaching their intended beneficiaries. Awareness was assessed through eight indicators encompassing knowledge of the Pradhan Mantri Fasal Bima Yojana (PMFBY), coverage of crops, premium calculation, claim procedures, information sources, and exposure to awareness programmes. Each response was rated on a three-point scale (High = 3, Moderate = 2, Low = 1). The results are summarised below.

Table 1: Awareness of Crop-Insurance Components among Marginal Farmers (n = 186)

Awareness Indicator	High (3)	Moderate (2)	Low (1)	Mean Score
Knowledge of PMFBY scheme	89	64	33	2.30
Awareness of crops covered	74	72	40	2.18
Understanding of premium calculation	56	71	59	1.96
Awareness of claim procedure	61	67	58	2.02
Knowledge of contact agency	70	69	47	2.12
Perceived benefit of insurance	79	73	34	2.24
Exposure to awareness programmes	54	66	66	1.94
Understanding of time limits for enrolment/claims	52	70	64	1.93
Composite Awareness Index				0.63 (Moderate)

Source: Primary field survey, 2024–25; computed using Awareness Index method adapted from Mahul & Stutley (2010) and Mukherjee & Pal (2019).



The results reveal that marginal farmers in Tamil Nadu possess a moderate overall level of awareness of crop-insurance programmes (Composite Index = 0.63). The highest mean score (2.30) corresponds to familiarity with the PMFBY itself, followed closely by understanding of insured crops (2.18) and perceived benefit (2.24). In contrast, comprehension of premium calculation (1.96) and claim procedures (2.02) remains limited, indicating that

awareness is primarily conceptual rather than operational. Only a minority of respondents had participated in formal awareness campaigns or training sessions, and understanding of procedural time limits was among the weakest aspects (mean = 1.93).

This pattern suggests that while farmers know about the existence of the scheme, many depend on intermediaries-

typically bank officials-for enrolment and claims, which constrains informed participation. For policy design, these findings underscore the need for targeted communication in Tamil, farmer-friendly visual guides, and pre-season

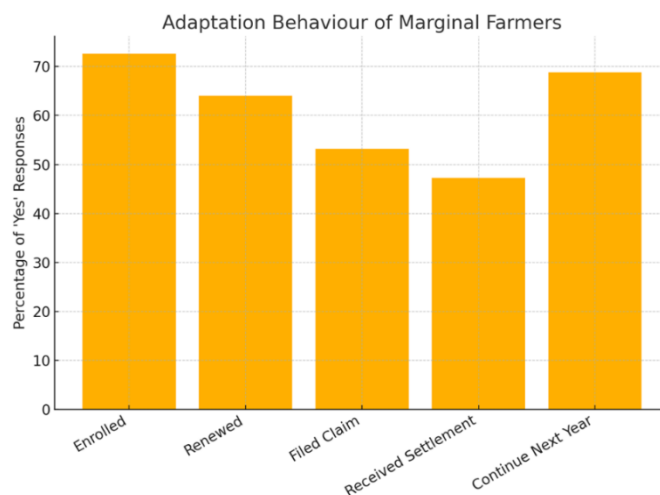
village-level orientation programmes led by extension officers and Krishi Vigyan Kendras. Enhanced procedural literacy would help convert basic awareness into effective and sustained adaptation.

5.3 Adaptation Behaviour

Table 2: Adaptation Components

Component	Yes (%)	No (%)
Enrolled in scheme	72.6	27.4
Renewed policy	64.0	36.0
Filed claim	53.2	46.8
Received settlement	47.3	52.7
Intend to continue	68.8	31.2

Adaptation Index = 0.57 (Moderate)



Participation is growing but unstable: about half of those who filed claims received settlements, indicating administrative lag. Yet the willingness of nearly 69 per cent

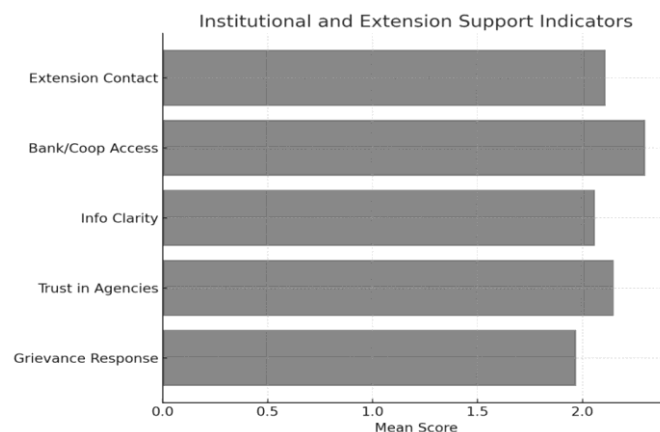
to continue suggests growing acceptance of crop-insurance as a risk buffer.

5.4 Institutional and Extension Support

Table 3: Institutional and Extension Indicators

Indicator	High	Moderate	Low	Mean
Extension contact frequency	67	72	47	2.11
Access to bank/cooperative	91	60	35	2.30
Clarity of official information	63	71	52	2.06
Trust in agencies	72	69	45	2.15
Grievance response	55	70	61	1.97

Institutional Index = 0.62 (Moderate)



Extension interactions occur mainly during enrolment or crop-cutting; continuous advisory support is minimal.

Limited clarity and delayed grievance responses reduce confidence in the system.

5.5 Farmers' Satisfaction

Table 4: Service Satisfaction

Service Aspect	High	Moderate	Low	Mean
Timeliness of settlement	44	72	70	1.88
Transparency	56	80	50	2.03
Ease of documentation	51	68	67	1.93
Amount of compensation	48	75	63	1.93
Behaviour of officials	61	73	52	2.05

Satisfaction Index = 0.60 (Moderate)

Respondents appreciated courteous local staff but cited persistent delays and inadequate compensation. Faster

settlements and simplified paperwork would substantially raise satisfaction.

5.6 Determinants of Awareness

Table 5: Multiple Regression Results (Dependent Variable: Awareness Index)

Predictor	β	t	p
Extension contact	0.326	5.12	0.000
Education	0.243	3.91	0.000
Landholding size	0.198	2.84	0.005
Credit access	0.181	2.59	0.011
Institutional trust	0.162	2.01	0.046
Income	0.092	1.22	0.224

$R^2 = 0.58$; Adj. $R^2 = 0.55$; $F = 34.27$ ($p < 0.01$)

Education and direct extension contact have the strongest positive effects. Income alone is not a determinant of awareness.

5.7 Determinants of Adaptation

Table 6: Logistic Regression Results (Dependent Variable: Adaptation Behaviour)

Predictor	β	Wald	p	Exp(β)
Awareness Index	1.842	11.72	0.001	6.31
Extension Contact	1.027	7.64	0.006	2.79
Credit Access	0.876	6.12	0.014	2.40
Institutional Trust	0.654	4.07	0.044	1.92
Education	0.512	3.10	0.078	1.67
Constant	-2.104			

Model $\chi^2 = 68.34$ ($p < 0.001$); Cox & Snell $R^2 = 0.42$; Nagelkerke $R^2 = 0.56$

Farmers with high awareness are about six times more likely to adopt insurance. Regular extension interaction and credit access further reinforce adaptation behaviour.

5.8 Correlations between Key Variables

Table 7: Correlation Matrix ($r, p < 0.01$)

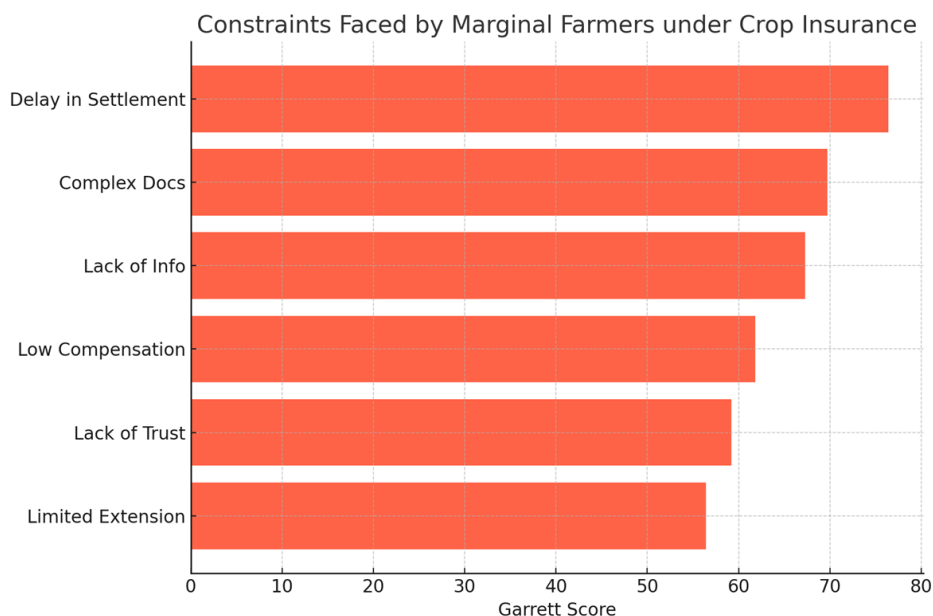
Variable	Awareness	Adaptation	Education	Credit	Extension	Trust	Satisfaction
Awareness	1	.71	.64	.61	.69	.66	.54
Adaptation		1	.59	.57	.63	.60	.55

Awareness is strongly correlated with adaptation ($r = 0.71$), highlighting that informed farmers are also more consistent participants.

5.9 Constraints Faced by Farmers

Table 8: Constraints Ranked by Garrett Scores

Constraint	Score	Rank
Delay in claim settlement	76.4	1
Complex documentation	69.7	2
Lack of timely information	67.3	3
Low compensation amount	61.8	4
Lack of trust in officials	59.2	5
Limited extension support	56.4	6



Administrative inefficiency-especially delayed claims and cumbersome paperwork-is the most critical barrier to effective participation.

6. Policy Implications

The results suggest that improving extension outreach should be the first priority. Field officers, Krishi Vigyan Kendras, and cooperatives must coordinate local campaigns, demonstrations, and Tamil-language handbooks before enrolment periods. Simplified one-page claim forms, mobile-based acknowledgements, and online tracking will cut delays and reduce grievances. Public disclosure of claim settlements at the panchayat level can restore transparency and trust. Financial institutions should integrate risk-management counselling into loan operations, while incentive schemes for timely renewals (e.g., small premium rebates) could promote sustained participation.

7. Conclusion

Awareness and adaptation of crop-insurance among marginal farmers in Tamil Nadu remain at moderate levels. Education, extension contact, credit access, and institutional trust are decisive in shaping both understanding and active participation. Procedural complexity and delayed settlements persist as major deterrents, yet the willingness of most farmers to continue policies reflects growing confidence in crop-insurance as a protective mechanism. Strengthening communication,

improving transparency, and delivering timely settlements will transform crop-insurance from a policy obligation into a credible pillar of rural risk management and livelihood security.

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