

CROP AND LIVESTOCK INSURANCE IN RURAL KARNATAKA: A COMPARATIVE ANALYTICAL FRAMEWORK FOR COVERAGE, CLAIM SETTLEMENT AND FARMER SATISFACTION

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Abstract

Agricultural households in rural Karnataka face production and asset-related risks arising from climatic variability, crop loss, livestock mortality and fluctuations in farm income. Crop and livestock insurance address these risks through different forms of financial protection, yet the two forms of insurance are less frequently examined within a common analytical framework. This paper develops a comparative analytical framework for examining crop and livestock insurance in rural Karnataka, with particular emphasis on coverage characteristics, claim settlement and farmer satisfaction. The analytical demonstration uses a simulated dataset of 400 observations, comprising 200 crop-insurance users and 200 livestock-insurance users, and applies descriptive statistics, claim-settlement indicators, Cronbach's alpha, an independent-samples t-test, Pearson correlation and multiple linear regression. Farmer satisfaction is represented through a ten-item five-point Likert scale, while claim settlement experience, claim transparency, service accessibility, premium affordability and selected socio-economic characteristics are treated as explanatory variables. The illustrative results show a claim settlement rate of 78.0% for crop insurance and 80.3% for livestock insurance. Overall satisfaction is 3.36 for crop insurance and 3.51 for livestock insurance, with the simulated group difference statistically significant ($t = -2.53$, $p = .012$). Claim settlement experience, transparency, accessibility and premium affordability also show positive associations with satisfaction in the illustrative regression model. Because respondent-level field data are not available for this manuscript, the numerical findings are presented strictly as a methodological demonstration rather than as estimates from a completed survey. The paper therefore contributes a structured framework that can be applied to verified farmer-level data in future empirical research.

Keywords: crop insurance; livestock insurance; farmer satisfaction; claim settlement; agricultural risk protection; Karnataka; rural farmers

1. Introduction

Agriculture is faced with several types of uncertainties such as bad weather, crop failures, disease, fluctuating prices, and mortality of livestock (Biswal & Bahinipati, 2022 Khan, 2017). In agricultural households, these types of uncertainties influence yearly agricultural production, production inputs, and farm incomes (Kumar et al., 2017; Kumari et al., 2017). Agricultural insurance allows risk management through sharing of part of the financial risk related to the loss insured with insurance companies. Mahul and Stutley (2010) carried out a study on the institutions and operations relating to agricultural insurance programs in developing countries, while Vishnoi et al. (2020) carried out a review on crop insurance due to weather conditions in India (Aditya et al., 2018).

Agricultural insurance is particularly relevant in rural Karnataka, where crop cultivation and livestock activities are important components of farm livelihoods (Aditya et al., 2020). While crop insurance mainly provides insurance for crops against certain crop risks, livestock insurance provides insurance

for the value of livestock against certain risks (Biswal & Bahinipati, 2025; Mohapatra & Dhaliwal, 2013). This distinction results in different experience of insurance regarding premiums, valuation, loss assessment, claims, and settlement (Birthal et al., 2022; Mohapatra et al., 2010; Yadav et al., 2021). Hence, a comparison of the two insurance types becomes relevant to the broader examination of agricultural insurance as a risk protection measure for rural settings (Clarke et al., 2012; Jamanal et al., 2019).

Insurance performance needs to be assessed beyond enrollment. This means that although the farmers have insurance, they can be unhappy because of information issues, unaffordable premiums, claims complexity, lack of transparency in loss evaluation and settlement delays (Ghosh, 2018; Ghosh, 2019). Several studies on agricultural insurance conducted in India have shown that accessibility, implementation performance, information and claim settlement are key determinants of performance of agricultural insurance (Kaur et al., 2021; Singh & Agrawal, 2020; Vishnoi et al., 2020).

Previous research on participation, awareness, implementation, claims settlement process and experiences of farmers in agriculture insurance scheme. Kaur et al. (2021) analyzed PMFBY scheme and found delays in the process of claim settlement process; complex nature of the scheme and unawareness are critical issues. Kumar & Babu (2021) analyzed participation of weather-based crop insurance among small groundnut farmers and discussed the correlation between participation and technical efficiency (Tiwari et al., 2020). As regards livestock insurance, Pallavi et al. (2019) analyzed the financial viability of livestock insurance in Karnataka, while Rohith et al. (2024) analyzed the adoption of cattle insurance scheme and obstacles to cattle insurance scheme in selected districts of Karnataka. The previous studies have provided some important results, however there are no comparisons between crop insurance and livestock insurance in terms of coverage, claims and satisfaction of the farmers (Swain & Hembram, 2020).

In the current research, there are three interrelated components, which include insurance coverage, claims settlement, and farmer satisfaction. Attributes of claims and services are studied in terms of overall satisfaction, whereas certain characteristics of farmers are incorporated as the explanatory factors. The quantitative analysis is deliberately simulated because no field data on individual respondents exist. Therefore, the obtained statistical findings only show how the suggested approach can be applied.

1.1. Objectives

- To examine the coverage characteristics of crop and livestock insurance among rural farmers in Karnataka.
- To compare claim incidence and claim settlement performance between crop and livestock insurance.
- To assess and compare farmer satisfaction with crop and livestock insurance services.
- To examine the association of selected insurance-service and farmer-level characteristics with overall farmer satisfaction.

1.2 Research Questions

- What differences exist in the coverage characteristics of crop and livestock insurance among rural farmers in Karnataka?
- How does claim settlement experience differ between crop and livestock insurance?
- How does farmer satisfaction differ between crop and livestock insurance services?
- Which insurance-service and farmer-level characteristics are associated with farmer satisfaction?

2. Literature Review

The literature review considers agricultural insurance as a means of risk management, including specifically crop insurance and livestock insurance. The literature reviewed is discussed from the perspective of its relevance to issues of insurance adoption, availability of information, affordability, claims process and effectiveness of implementation. Emphasis has been laid upon evidence pertaining specifically to Karnataka regarding livestock insurance, as well as evidence pertaining to India with regard to crop insurance.

2.1 Agricultural Insurance and Rural Risk Protection

Mahul and Stutley (2010) studied governmental support to agricultural insurance schemes in developing nations and studied the organizational and operational factors that relate to success in running the scheme. This research stressed product design, organizational capability, agricultural information, and operational factors (Mahul & Stutley, 2010).

Vishnoi et al. (2020) studied weather index based crop insurance in India and looked at the operational issues related to weather information, product design, and operation (Vishnoi et al., 2020).

Ogra (2018) analyzed the Weather Based Crop Insurance Scheme in the context of climate adaptation and pointed out the significance of recognizing the link between technical triggers of insurance and farmers' perception of weather (Ogra, 2018).

Singh and Agrawal (2020) reviewed the development and performance of crop insurance programs in India and noted persistent issues with respect to accessibility and implementation (Singh & Agrawal, 2020).

Kumar & Babu (2021) studied the effect of the weather index crop insurance scheme on the participation rate of small-scale groundnut farmers in the scheme and employed Data Envelopment Analysis and Propensity Score Matching in the analysis of technical efficiency. They observed that the participants were technically efficient in their case study (Kumar & Babu, 2021).

Biswal & Bahinipati (2022) reviewed the determinants of crop insurance adoption in India, and noted that adoption is impacted by social, economic, educational, structural and behavioral determinants (Biswal & Bahinipati, 2022).

2.2 Coverage, Claims and Farmer Experience

Pallavi et al. (2019) carried out an economic study to assess the financial feasibility of livestock insurance in Bengaluru Rural district through data obtained from 120 farmers and provided claim-to-premium ratios for the various insurance schemes studied (Pallavi et al., 2019).

Rohith et al. (2024) carried out an evaluation on cattle insurance in Kolar, Shivamogga and Dharwad based on a sample size of 240 dairy farmers using a combination of tabular analysis, Z-test, Mann-Whitney U test and Henry Garrett Ranking Technique (Rohith et al., 2024).

2.3 Research Gap

There are three major research gaps that can be noted through the review of literature. First, studies related to insurance in India are more concentrated on the insurance for crops and weather; and not on comparative studies for crop insurance versus livestock insurance. Second, coverage, claims, and experiences of farmers are always studied separately and not as a group. Finally, there are some studies conducted on livestock insurance in Karnataka, but very few comparative studies for both crop insurance and livestock insurance, in addition to farmer experiences with claims and services.

3. Conceptual Framework and Hypotheses

The concept framework focuses on overall farmers' satisfaction as the dependent variable. The process characteristics of coverage represent the participation and involvement of farmers in the insurance process. Experience of claims settlement represents the performance dimension of the financial security process; while service quality represents availability, transparency and affordability. Insurance process characteristics, education level, and land holding size represent explanatory variables. Thus, the research model links the process dimensions of the insurance process to service experience perception.

Table 1. Operationalization of Key Constructs

Construct	Operational indicators
Coverage	Insurance participation, years insured, premium, sum insured or insured animal value
Claim experience	Claim filed, approval, settlement, settlement time and settled claim amount
Service quality	Accessibility, information clarity, affordability, transparency and responsiveness
Trust	Confidence in insurer and claim process
Farmer satisfaction	Ten-item five-point Likert satisfaction scale

3.1 Hypotheses

- H1: Farmer satisfaction differs significantly between crop-insurance and livestock-insurance users.
- H2: Claim settlement experience is significantly associated with farmer satisfaction.
- H3: Perceived transparency of the claim process is significantly associated with farmer satisfaction.
- H4: Service accessibility is significantly associated with farmer satisfaction.
- H5: Selected socio-economic and insurance-experience characteristics, including education, insurance experience and landholding size, are significantly associated with farmer satisfaction.

4. Research Methodology

This section presents the research design, study area, target population, sampling procedure, sample size, data collection instrument, measurement of farmer satisfaction, and statistical techniques employed for the comparative analysis of crop and livestock insurance in rural Karnataka. The study focuses on rural farmers in Mandya and Chamarajanagar districts and examines insurance coverage, claim settlement, service experience, and farmer satisfaction.

4.1 Research Design and Study Area

The study adopts a cross-sectional comparative research design to examine crop and livestock insurance among rural farmers in Karnataka. The study is conducted in selected rural areas of Mandya and Chamarajanagar districts. These districts represent important agricultural settings where crop cultivation and livestock activities constitute significant components of rural livelihoods. The comparative design facilitates the examination of crop and livestock insurance within a common geographical and analytical setting, with particular focus on insurance coverage, claim settlement, service experience, and farmer satisfaction.

4.2 Population, Sampling and Sample Size

The target population consists of rural farmers that use crop insurance or livestock insurance in the chosen study regions. A sample size of 400 farmers is involved in the study, which includes 200 farmers using crop insurance and 200 farmers using livestock insurance. The two insurance categories are viewed as two distinct groups for comparative analysis purposes. Multi-stage sampling approach is used for choosing the study regions, rural administrative units, villages, and farmers with insurance coverage. The distribution of the sample between the two insurance categories is shown in Table 2.

Table 2. Sample Distribution by Insurance Group

Insurance Group	Respondents	Share
Crop insurance	200	50.0%
Livestock insurance	200	50.0%
Total	400	100.0%

4.3 Data Sources and Instrument

The research relies on primary data, obtained through the use of structured farmers' questionnaires. The questionnaire addresses socio-demographic variables, farm variables, involvement in insurance, premium, sum insured or value of insured animals, claim experience, claim settlement experience, insurance service variables, and farmer satisfaction. The variable of farmer satisfaction is based on ten questions answered by farmers in terms of a five-point Likert scale from one being strongly dissatisfied to five strongly satisfied.

4.4 Measurement of Farmer Satisfaction

Farmer Satisfaction Index (FSI) is calculated using the ten satisfaction items included in the questionnaire. The obtained satisfaction score is expressed as a percentage of the maximum possible satisfaction score. The FSI is presented on a scale ranging from 0 to 100, while the individual satisfaction items are measured using a five-point Likert scale.

$$\text{FSI} = (\text{Obtained Satisfaction Score} / \text{Maximum Possible Satisfaction Score}) \times 100$$

The index provides a standardized measure for assessing and comparing the overall satisfaction of farmers using crop insurance and livestock insurance.

4.5 Statistical Analysis

The collected data are analyzed using descriptive and inferential statistical techniques to address the study objectives. Frequency and percentage distributions are used to summarize categorical characteristics, while means and standard deviations are used to describe continuous variables and satisfaction dimensions. Claim settlement performance is assessed using claim incidence, claim approval, claim settlement, settlement time, and claim settlement rate.

The claim settlement rate is calculated as:

$$\text{Claim Settlement Rate} = (\text{Claims Settled} / \text{Claims Filed}) \times 100$$

The Farmer Satisfaction Scale consistency is measured through Cronbach's alpha coefficient. The comparison of satisfaction level between crop insurance and livestock insurance categories is carried out through the independent samples t-test, where the effect size will be estimated using the Cohen's d measure. For the examination of correlations between farmer satisfaction, claims settlement process, transparency and accessibility of the service, Pearson correlation test will be used. The multiple linear regression analysis will be used to measure factors related to overall farmer satisfaction.

Table 3. Statistical Techniques Used in the Study

Research Objective	Statistical Technique
Coverage characteristics	Frequency, percentage, mean and standard deviation
Claim settlement	Claim incidence, claim approval, settlement rate and settlement time
Satisfaction measurement	Mean, standard deviation and satisfaction index
Scale reliability	Cronbach's alpha
Crop–livestock comparison	Independent-samples t-test and Cohen's d
Variable association	Pearson correlation
Factors associated with satisfaction	Multiple linear regression
Hypothesis assessment	p-value at the 5% significance level

5. Results and Analysis

In this section, the results come from the simulation of the analytical data set of 400 observations. The numbers give examples of the statistical techniques and comparative analysis that have been suggested above. They do not pretend to be field observations or statistics.

5.1 Socio-Demographic and Farm Profile

Table 4 shows the socio-demographic and farm characteristics of the 400 observations used for analysis. Age 41 to 50 has the highest number of observations at 128 (32.0%), while age 31 to 40 follows at 112 (28.0%) and age above 50 at 102 (25.5%); below 30 years has 58 (14.5%).

Table 4. Socio-Demographic and Farm Characteristics of the Analytical Sample (N = 400)

Characteristic	Category	Frequency	Percentage
Age	Below 30 years	58	14.5%
	31–40 years	112	28.0%
	41–50 years	128	32.0%
	Above 50 years	102	25.5%
Gender	Male	292	73.0%
	Female	108	27.0%
Education	Primary/Secondary	164	41.0%
	Higher Secondary	126	31.5%
	Graduate and above	110	27.5%
Landholding	Below 2 acres	138	34.5%
	2–5 acres	164	41.0%
	Above 5 acres	98	24.5%

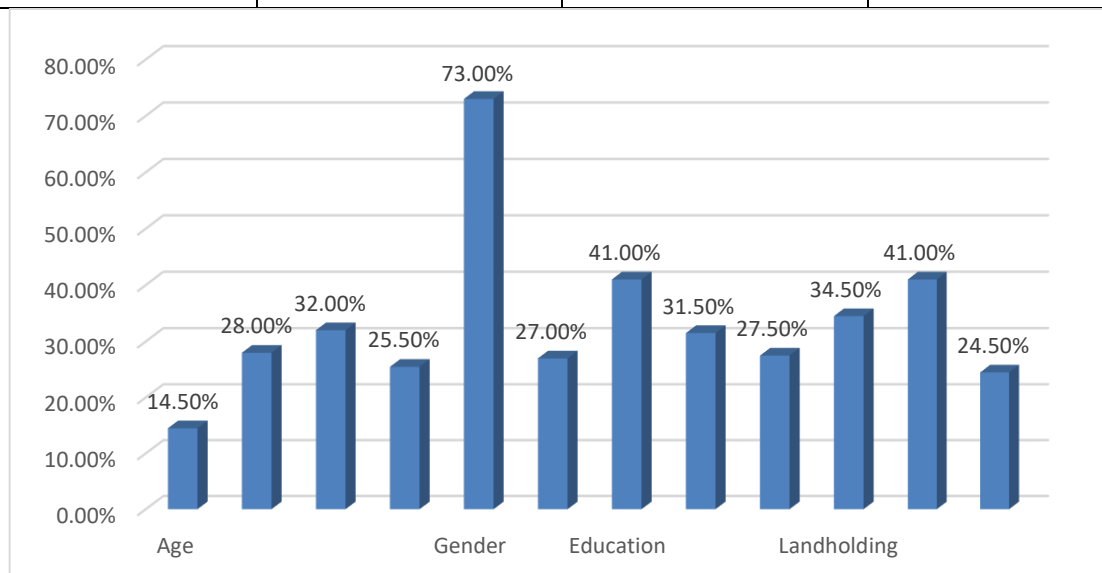


Figure 1: Graphical Representation on the percentage of Socio-Demographic and Farm Characteristics

The proportion of male observations is 292 (73.0%), whereas the proportion of female observations is 108 (27.0%). In terms of education, 164 observations (41.0%) are in the category of primary and secondary education, 126 observations (31.5%) are in higher secondary education, and 110 (27.5%) are in graduate and above education. The land ownership is mainly in the category of 2-5 acres, which is represented by 164 observations (41.0%), below 2 acres (138), and above 5 acres (98).

5.2 Insurance Coverage Characteristics

Table 5 shows the insurance coverage and claim experience of the two study groups. The average duration of insurance coverage is 4.1 years in case of crop insurance and 3.6 years in livestock insurance.

Table 5. Insurance Coverage and Claim Profile of the Analytical Sample

Indicator	Crop insurance	Livestock insurance
Respondents	200	200
Average years insured	4.1	3.6
Average annual premium	₹1,860	₹2,240
Average sum insured / insured animal value	₹68,500	₹82,700
Claimants	82	76
Non-claimants	118	124

The average premium per annum is ₹1,860 for crop insurance and ₹2,240 for livestock insurance. The average sum insured is ₹68,500 for crop insurance and ₹82,700 for livestock insurance; each of these two averages is computed separately since they both are forms of different insurances. Crop insurance claims have been observed in 82 cases and 76 cases for livestock insurance, whereas there have been 118 and 124 observations as non-claims.

5.3 Claim Incidence and Settlement

Table 6 illustrates the claim settlement pattern of the two types of insurance. From the total number of observations made, there are 82 crops insurance claims and 76 livestock insurance claims.

Table 6. Claim Settlement Profile

Indicator	Crop insurance	Livestock insurance
Farmers experiencing insured loss	82	76
Claims filed	82	76
Claims approved	69	66
Claims settled	64	61
Claims pending	5	5
Claims rejected	13	10
Average settlement time (days)	42.6	35.8
Average settled claim	₹31,450	₹36,820
Claim settlement rate (%)	78.0	80.3

Out the above claims, 69 and 66 claims of crop insurance and livestock insurance have been approved respectively, but 64 and 61 claims are settled from these. In both types of insurance, 5 claims are still under processing while 13 and 10 claims are rejected in each. The average time for settlement of claims is 42.6 days and 35.8 days for crop insurance and livestock insurance respectively. The average amount of settled claims is ₹31,450 and ₹36,820 in crop insurance and livestock insurance respectively.

5.4 Farmer Satisfaction

Table 7 shows the average satisfaction ratings on the ten dimensions of satisfaction. The livestock insurance cluster shows higher illustrative average ratings than the crop insurance cluster on all dimensions of satisfaction. In the case of crop insurance, the ratings go from a low of 3.05 for promptness of settlement to a high of 3.62 for the enrolment process.

Table 7. Farmer Satisfaction Scores

Satisfaction dimension	Crop mean	Livestock mean
Enrolment process	3.62	3.71
Premium affordability	3.48	3.55
Information clarity	3.41	3.56
Claim process	3.18	3.42
Claim transparency	3.12	3.38
Settlement timeliness	3.05	3.31
Service accessibility	3.58	3.67
Staff responsiveness	3.44	3.59
Trust in insurer	3.29	3.47
Overall satisfaction	3.36	3.51

Transparency of claims is rated as 3.12 and 3.38 for crop insurance and livestock insurance, respectively. Claim processing satisfaction scores 3.18 and 3.42 for crop insurance and livestock insurance. Service availability has a score of 3.58 and 3.67, while responsiveness of staff scores 3.44 and 3.59. Satisfaction levels overall for crop insurance and livestock insurance are 3.36 and 3.51. Descriptive difference is tested in Table 9.

5.5 Reliability Analysis

The Cronbach's Alpha for the ten-item scale of Farmer Satisfaction Scale is 0.884, as shown in

Table 8. Reliability Statistics of the Farmer Satisfaction Scale

Scale	Items	Cronbach's alpha
Farmer Satisfaction Scale	10	0.884

For the simulated data analysis set, such a level shows strong consistency among the items of the scale. Reliability must always go hand in hand with information on the development, validity, and final coding of the items.

5.6 Comparative Test of Farmer Satisfaction

Table 9 below shows the comparison of satisfaction levels between the two independent analysis groups. The overall satisfaction levels for crop insurance are 3.36 while those for livestock insurance are 3.51, showing a statistical significance difference ($t = -2.53$, $p = 0.012$).

Table 9. Independent-Samples t-Test of Farmer Satisfaction

Measure	Crop mean (SD)	Livestock mean (SD)	t-value	p-value	Cohen's d
Overall satisfaction	3.36 (0.61)	3.51 (0.58)	-2.53	0.012	-0.252
Claim-process satisfaction	3.18 (0.72)	3.42 (0.66)	-3.47	<0.001	-0.347
Claim transparency	3.12 (0.76)	3.38 (0.69)	-3.59	<0.001	-0.358
Settlement timeliness	3.05 (0.79)	3.31 (0.73)	-3.40	0.001	-0.342

Record satisfaction with the claims process results in scores of 3.18 and 3.42 ($t = -3.47$, $p < .001$), record satisfaction with the claims transparency results in scores of 3.12 and 3.38 ($t = -3.59$, $p < .001$), and record satisfaction with the timeliness of settlements results in scores of 3.05 and 3.31 ($t = -3.40$, $p = .001$). The

Cohen's d results suggest that there are small-to-moderate group differences in the context of the simulated analysis.

5.7 Correlation Analysis

Table 10 gives the Pearson correlation between overall satisfaction, claim settlement experience, transparency, and service accessibility. The variables that show positive correlation with satisfaction are claim settlement experience ($r = .612$), transparency ($r = .574$), and accessibility ($r = .481$).

Table 10. Pearson Correlation Matrix

Variable	Satisfaction	Claim settlement experience	Transparency	Accessibility
Satisfaction	1.000	0.612**	0.574**	0.481**
Claim settlement experience	0.612**	1.000	0.536**	0.391**
Transparency	0.574**	0.536**	1.000	0.428**
Accessibility	0.481**	0.391**	0.428**	1.000

The experience of claim settlement has a positive relationship with transparency ($r = .536$) and accessibility ($r = .391$). On the other hand, there is a positive relationship between transparency and accessibility ($r = .428$). In the artificial analytical data set, all coefficients denoted by ** are statistically significant at the 1% level. Since correlation does not imply causation, regression analysis assesses the joint effect of the explanatory variables on satisfaction.

5.8 Multiple Regression Analysis

Multiple regression model of farmer's general satisfaction is given in Table 11. The variables, claim settlement experience and claim transparency, are statistically significant and have positive coefficients ($B = 0.286$, $\beta = 0.312$, $t = 6.98$, $p < .001$; $B = 0.241$, $\beta = 0.238$, $t = 5.02$, $p < .001$) respectively. Service accessibility ($B = 0.196$, $\beta = 0.204$, $t = 4.36$, $p < .001$) and premium affordability ($B = 0.151$, $\beta = 0.142$, $t = 2.90$, $p = .004$) are also statistically significant.

Table 11. Multiple Regression Results for Farmer Satisfaction

Predictor	B	SE	Beta	t	p-value
Constant	1.024	0.214	—	4.79	<0.001
Claim settlement experience	0.286	0.041	0.312	6.98	<0.001
Claim transparency	0.241	0.048	0.238	5.02	<0.001
Service accessibility	0.196	0.045	0.204	4.36	<0.001
Premium affordability	0.151	0.052	0.142	2.90	0.004
Insurance experience	0.028	0.014	0.081	2.00	0.046
Education	0.036	0.018	0.073	2.00	0.046
Landholding size	0.022	0.014	0.059	1.57	0.117

Model summary: $R^2 = .548$; adjusted $R^2 = .540$; $F \approx 67.89$, $p < .001$. Coefficients are interpreted as associations. All values are illustrative.

Experience in insurance and education are important at the 5% level, while land size is not statistically important. The example model shows $R^2 = .548$ and adjusted $R^2 = .540$, which means that the percentage of variance explained by the model of the measure of satisfaction is 54.8%. The coefficients are interpreted in terms of association, not causality. For an empirical study, the regression model must also include multicollinearity tests like variance inflation factor (VIF) and tolerance tests, residual independence test using Durbin–Watson statistic, and tests of linearity and homoscedasticity. These tests are not included as observed values in the current paper because the data set for each respondent is fabricated.

5.9 Hypothesis Testing

Table 12 provides a summary of the hypothesis testing process. H1 is accepted in the simulation since the independent samples t-test reveals a statistically significant difference in overall satisfaction between the two sets of analysts. H2, H3 and H4 are accepted in the simulation since claim settlement experience, claim transparency and service accessibility are statistically significant in the regression analysis.

Table 12. Hypothesis Testing

Hypothesis	Test	Illustrative result	Decision
H1	Independent-samples t-test	$p = 0.012$	Supported within simulation
H2	Multiple regression	$p < 0.001$	Supported within simulation
H3	Multiple regression	$p < 0.001$	Supported within simulation
H4	Multiple regression	$p < 0.001$	Supported within simulation
H5	Multiple regression	Education and insurance experience significant; landholding size non-significant	Partially supported within simulation

H5 gets partial acceptance since education and insurance experience are important factors, but the landholding size is insignificant. This shows how the suggested testing framework works, and no population-level relationships are formed here.

6. Discussion

The analytical framework shows that the performance of agricultural insurance can be evaluated not only by enrolment and coverage but also by other means. Coverage features indicate the extent of the insurance product, claim-settlement indicators assess the operation of compensation, and farmer satisfaction indicates the quality of the insurance process. This approach aligns well with literature on the dimensions of agricultural insurance performance as access, quality of implementation, information limitations, and claim settlement (Mahul & Stutley, 2010; Singh & Agrawal, 2020; Vishnoi et al., 2020).

The illustrative example of claim-settlement comparison shows the importance of evaluating not only the settlement rates but also settlement time. The simulated livestock-insurance group has a somewhat higher settlement rate and shorter average settlement period compared to the crop-insurance group. While those numbers cannot be considered true for Karnataka, they illustrate how a comparative empirical study may measure the performance of claim settlement using various indicators. The emphasis made in the analytical framework corresponds to the previous studies of India where claim settlement and implementation were identified as important components of agricultural insurance performance (Kaur et al., 2021; Vishnoi et al., 2020).

The satisfaction framework centers on claim experience, transparency and timely settlement of the farmers' claims. Theoretical grounding is consistent with Ogra (2018) who emphasized the necessity of convergence between formal insurance procedures and the farmers' perception of risk associated with weather. Another similar study is provided by Kaur et al. (2021) who revealed such problems in the implementation of the PMFBY policy as system complexity, awareness, and claim delay. The current framework extends this research in comparison of service and claims experience of insurance with coverage.

Livestock insurance is a particular case that relates to the Karnataka setting. Pallavi et al. (2019) investigated financial sustainability of livestock insurance in Bengaluru Rural, while Rohith et al. (2024) analyzed cattle insurance adoption and barriers in selected Karnataka districts. The current framework is not an attempt to repeat those studies; rather, it uses the Karnataka specificity to compare crop and livestock insurances from the service perspective.

In this way, the illustrative regression model highlights the possibilities for analyzing objective claim characteristics and subjective perception of services characteristics at the same time. Experience of claim settlement, transparency, accessibility, and affordable premiums are positively related to satisfaction in the hypothetical model. Thus, it becomes clear that satisfaction relates to the quality of the process of providing insurance protection, not only to the protection itself. However, such interpretation of the relationship between variables is hypothetical, since numerical coefficients are hypothetical.

7. Conclusion and Implications

This paper presents a comparative framework to study crop and livestock insurance in rural Karnataka based on coverage, claim settlement and farmer satisfaction. The proposed framework recognizes objective insurance process measures against subjective farmer perceptions of service performance, and emphasizes overall satisfaction as the main outcome measure. The simulated case of N=400 analysis framework is used to illustrate how descriptive statistics, claim settlement performance measures, reliability tests, comparison between independent samples, correlation and multiple regression work.

The most important feature of the framework is the integration of the insurance performance measures with the experience of farmers with service in one comparative framework. Coverage indicates the extent of the insurance product, claim settlement represents how the insurance serves as a form of financial protection and satisfaction is an indicator of the performance of service delivery. The framework also includes empirical examples related to livestock insurance in Karnataka. As a practical implication for comparative analysis, an empirical analysis should measure not just whether farmers have an insurance cover, but for how long and what amount of coverage, claim incidence and settlement, claim settlement period, transparency, accessibility, affordability and satisfaction.

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