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Interrelationships among personal, socio-economic, and psychological characteristics of coconut farmers: Insights from a multi-storeyed farming system

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Abstract

This study investigates the interrelationships between personal, socio-economic, and psychological characteristics of coconut-growing farmers utilizing multi-storeyed farming systems. Analyzing data from 40 coconut growers practicing multi-storeyed cropping system in coconut were chosen from Dakshina Kannada district of Karnataka, we identify several significant correlations that shed light on these dynamics. Landholding size exhibits a strong positive correlation with both annual income and farming experience, indicating that farmers with larger landholdings typically achieve higher income levels and that extensive farming experience is often associated with advancing age. Furthermore, active participation in agricultural extension services is positively correlated with material possession, suggesting that farmers who engage more with extension programs are likely to acquire more assets, potentially due to improved access to resources and enhanced farming practices. In contrast, a higher level of farming commitment is negatively correlated with landholding size and annual income, implying that greater dedication to farming does not necessarily equate to larger landholdings or higher income, possibly due to limitations in land expansion or resource availability. Economic motivation is positively related to social participation, age, and farming experience, highlighting that farmers with a strong economic drive tend to be more socially active and possess greater experience and maturity. These findings illustrate the complex interplay between various characteristics, offering insights into how these factors collectively impact economic and operational outcomes in agricultural settings.

Keywords: Farmer profile, farm management, agricultural sociology, farmer decision-making, sustainable agriculture

Introduction

Agriculture remains a cornerstone of many economies, particularly in rural areas where farming practices are deeply intertwined with daily life and economic stability. Among various agricultural practices, multi-storeyed farming systems—where multiple layers of crops or plants are grown in a single area—have emerged as an innovative approach to enhance productivity and resource use. In this context, understanding the diverse factors influencing farmers' success is crucial. This study focuses on coconut-growing farmers who adopt multi-storeyed farming systems, exploring how their personal, socio-economic, and psychological characteristics interplay to affect their farming practices and outcomes. Personal characteristics such as age, education, and family structure can significantly impact a farmer's approach to farming. Socio-economic factors, including landholding size, annual income, and material possessions, often determine the resources available to farmers and their capacity to invest in and benefit from advanced farming practices. Additionally, psychological attributes like farming commitment, risk orientation, and economic motivation play a pivotal role in shaping farmers' attitudes and behaviors towards their agricultural endeavors. By analyzing data from 40 respondents involved in multi-storeyed coconut farming, this study aims to uncover the complex relationships among

these characteristics and their influence on farming efficiency and economic success. Identifying these relationships not only contributes to a deeper understanding of farmer behavior but also informs strategies for improving agricultural practices and policy development. Through this examination, the study seeks to provide valuable insights for policymakers, extension services, and farmers themselves, facilitating better support systems and more effective farming strategies in the context of multi-storeyed agriculture.

Materials and Methods

The study was conducted among coconut-growing farmers engaged in multi-storeyed farming systems. The research focused on a sample of 40 respondents selected from a specific region known for its adoption of such farming practices. The selection was purposive, targeting farmers actively involved in multi-storeyed coconut farming to ensure relevance and accuracy of the data. Data were collected through a structured questionnaire administered to the 40 selected respondents. The questionnaire was designed to capture a range of information, categorized into three main areas: personal characteristics, socio-economic characteristics, and psychological characteristics.

Personal Characteristics: Included age, education level, family type, farming experience, social participation,

extension participation, extension contact, and mass media exposure. These variables were categorized into specific groups to facilitate analysis.

Socio-Economic Characteristics: Focused on landholding size, annual income, material possession, cropping intensity, and economic motivation. These factors were assessed to determine their impact on the farmers' economic and operational status.

Psychological Characteristics: Evaluated aspects such as farming commitment, risk orientation, market orientation, innovative proneness, scientific orientation, and change proneness. These psychological traits were measured to understand their influence on farmers' attitudes and behaviors.

The collected data were subjected to statistical analysis to identify significant correlations and relationships among the variables. Descriptive statistics were used to summarize the demographic and socio-economic profiles of the respondents.

- 1. Correlation Analysis:** Pearson correlation coefficients were calculated to determine the strength and direction of the relationships between personal, socio-economic, and psychological characteristics. This analysis helped identify significant associations and dependencies among the variables.
- 2. Data Validation:** The validity of the data was ensured through pre-testing the questionnaire, followed by adjustments based on feedback. Data entry was checked for accuracy, and outliers were addressed to maintain the integrity of the analysis.

Table 1: Distribution of respondents according to personal characteristics (n =40)

Sl. No.	Characteristics	Category	Total (n=40)	
1.	Age	Young (up to 35)	7	17.50
		Middle (36-50)	17	42.50
		Old (> 50)	16	15.00
2.	Education	Illiterate	0	0.00
		Primary school	4	10.00
		Middle School	12	30.00
		Higher Secondary	8	20.00
3.	Family Type	Graduation and above	16	40.00
		Nuclear	25	62.50
4.	Farming Experience	Joint	15	37.50
		Low	10	25.00
		Medium	10	25.00
5.	Social Participation	High	20	50.00
		Never	1	2.50
		Occasional	29	72.50
6.	Extension Participation	Regular	10	25.00
		Low	6	15.00
		Medium	24	62.50
7.	Extension Contact	High	10	25.00
		Low	8	23.88
		Medium	23	50.56
8.	Mass Media Exposure	High	9	25.56
		Low	8	20.00
		Medium	18	45.00
		High	14	35.00

Table 2: Distribution of respondents according to socio-economic characteristics (n =40)

Sl. No.	Characteristics	Category	Total (n=40)	
1.	Size of landholdings	Marginal (< 2.5 acres)	10	25.00
		Small (2.51 – 5.0 acres)	10	25.00
		Big (>5.0 acres)	20	50.00
2.	Annual Income	Low	11	27.50
		Medium	20	50.00
		High	9	22.50
3.	Material Possession	Low	4	10.00
		Medium	20	50.00
		High	16	40.00
4.	Cropping Intensity	Low	0	0.00
		Medium	40	100.00
		High	0	0.00
5.	Economic Motivation	Low	2	5.00
		Medium	21	52.50
		High	17	42.50

Table 3: Distribution of respondents according to psychological characteristics (n=40)

Sl. No.	Characteristics	Category	Total (n=40)	
1.	Farming Commitment	Low	11	27.50
		Medium	20	50.00
		High	9	22.50
2.	Risk Orientation	Low	5	12.50
		Medium	21	52.50
		High	14	35.00
3.	Market Orientation	Low	10	25.00
		Medium	15	37.50
		High	15	37.50
4.	Innovative Proneness	Low	10	25.00
		Medium	25	62.50
		High	5	12.50
5.	Scientific Orientation	Low	7	17.50
		Medium	17	42.50
		High	16	40.00
6.	Change Proneness	Low	10	25.00
		Medium	13	32.50
		High	17	42.50

Table 4: Correlation analysis between selected independent variables (n = 40)

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19
X1	1																		
X2	0.09	1																	
X3	0.11	-0.08	1																
X4	0.27	0.00	0.18	1															
X5	0.22	-0.11	0.16	-0.16	1														
X6	0.19	.907**	-0.07	0.14	-0.12	1													
X7	.996**	0.10	0.12	0.27	0.23	0.19	1												
X8	0.13	0.18	0.26	0.15	0.28	0.06	0.149	1											
X9	-0.01	0.08	0.09	-0.06	0.07	0.00	0.004	.433**	1										
X10	-0.06	-.387*	0.04	-0.26	0.20	-.539**	-0.064	0.228	0.11	1									
X11	0.20	0.00	-0.21	.328*	0.15	0.12	0.209	-0.016	-0.03	-0.10	1								
X12	0.21	0.05	-0.12	0.04	0.14	-0.04	0.196	0.058	0.24	0.07	.449**	1							
X13	0.26	0.14	0.21	0.13	0.10	0.13	0.254	0.11	0.23	-0.17	0.043	0.21	1						
X14	-0.07	0.22	-0.03	0.14	-0.10	0.28	-0.046	0.278	0.26	-0.20	0.115	-0.06	0.12	1					
X15	.322*	0.25	0.28	0.09	.351*	0.07	.323*	.397*	0.18	0.00	-0.02	0.23	0.22	0.11	1				
X16	0.15	-0.09	-0.03	0.11	0.03	-0.17	0.164	0.059	0.27	0.09	0.198	0.06	0.08	0.00	0.20	1			
X17	0.23	0.18	.322*	0.05	-0.07	0.25	0.225	-0.123	0.02	-0.15	0.247	0.16	0.17	-0.22	-0.10	-0.18	1		
X18	0.17	0.11	-0.12	0.16	0.12	0.12	0.191	-0.043	0.16	-0.07	0.233	.428**	0.20	0.15	0.00	0.03	-0.10	1	
X19	.329*	0.17	-0.27	.357*	-0.06	0.31	.325*	0.176	0.03	-0.22	.383*	0.23	0.23	0.20	0.10	0.02	0.09	0.09	1

** Correlation significant at the 0.01 level (2-tailed) * Correlation is significant at the 0.05 level (2-tailed)

X1 = Age, X2 = Landholding, X3= Family size, X4 = Education, X5=Social Participation, X6= Annual Income, X7= Farming Experience, X8 Material Possession, X9= Extension Participation, X10= Farming Commitment, X11= Extension Contact, X12 = Cropping Intensity, X13= Mass media exposure, X14= Risk orientation, X15= Economic Motivation, X16=Market Orientation, X17= Innovative proneness, X18=Scientific orientation and X19= Change proneness

Results and Discussion

Personal Characteristics

The distribution of respondents according to personal characteristics is detailed in Table 1. Among the 40 respondents, 42.5% were in the middle age group (36-50 years), making it the largest age category. The young group (up to 35 years) comprised 17.5% of the respondents, while 40% were older than 50 years. Similar findings were reported by Anushree and Madan (2018) ^[1] and Sandeep *et. al.*, 2020 ^[5]. In terms of education, a significant majority (40%) had achieved graduation or higher, while 30% had completed middle school. Only 10% had attained primary school education, and there were no illiterate respondents. Regarding family type, 62.5% lived in nuclear families, and 37.5% were part of joint families. For farming experience, half of the respondents (50%) reported having high

experience, while 25% had medium and low levels of farming experience each. Social participation was predominantly occasional, reported by 72.5% of the respondents, while regular participation was noted by 25%, and only 2.5% had no social participation. Extension participation was primarily at a medium level (62.5%), with 25% participating at a high level and 15% at a low level. Extension contact was medium for half of the respondents (50.56%), while 23.88% had low contact and 25.56% had high contact. Mass media exposure was medium for 45% of the respondents, high for 35%, and low for 20%.

Socio-Economic Characteristics

Table 2 presents the distribution of socio-economic characteristics. The majority of respondents (50%) had large landholdings (>5.0 acres), with 25% each holding marginal

(<2.5 acres) and small (2.51–5.0 acres) sizes. Annual income was primarily medium for 50% of the respondents, while 27.5% reported low income and 22.5% had high income. Material possession was moderate for 50% of the respondents, with 40% having high possession and 10% having low possession. Cropping intensity was uniformly medium for all respondents (100%). Economic motivation was largely medium (52.5%), with 42.5% reporting high motivation and only 5% low motivation.

Psychological Characteristics

Table 3 outlines the psychological characteristics of the respondents. Farming commitment was medium for 50% of the respondents, low for 27.5%, and high for 22.5%. Risk orientation was primarily medium (52.5%), with 35% being high risk-oriented and 12.5% low risk-oriented. The results are almost similar to findings of Raksha *et al.*, (2017) [4]. Market orientation was evenly split between low and high categories (25% and 37.5%, respectively), with 37.5% having medium market orientation. Innovative proneness was predominantly medium (62.5%), with 25% showing low proneness and 12.5% high proneness. Scientific orientation was also largely medium (42.5%), with high orientation reported by 40% and low orientation by 17.5%. Change proneness was high for 42.5% of the respondents, medium for 32.5%, and low for 25%.

Results of correlation analysis

The correlation analysis revealed significant relationships among various factors. Landholding (X2) showed a strong positive correlation with Annual Income (X6) (.907**), and Farming Experience (X7) had a very strong positive correlation with Age (X1) (.996**). Additionally, Extension Participation (X9) was positively correlated with Material Possession (X8) (.433**). Farming Commitment (X10) was negatively correlated with both Landholding (X2) (-.387*) and Annual Income (X6) (-.539**). Economic Motivation (X15) demonstrated significant positive correlations with Social Participation (X5) (.351*), Age (X1) (.322*), and Farming Experience (X7) (.323*), indicating that these factors are positively related to economic motivation in the context of farming.

The correlation analysis of coconut-growing farmers following the Multi-storeyed farming system provides insightful findings on the relationships between various profile characteristics. Landholding exhibited a strong positive relationship with Annual Income, suggesting that larger landholdings are associated with higher income levels. This was in compliance with the results of Gulati *et al.*, conducted in 2021 [2]. This implies that farmers with more land are likely to experience greater financial success, possibly due to increased production capacity or economies of scale. Farming Experience showed a very strong positive correlation with Age, which indicates that as farmers grow older, their experience in farming increases. This aligns with the understanding that farming is a field where accumulated experience plays a critical role, and older farmers are likely to have more extensive knowledge and expertise and was in compliance with the results of Zhou and Li conducted in 2022 [6]. Extension Participation, which refers to engagement with agricultural extension services, was positively correlated with Material Possession. This

suggests that farmers who actively participate in extension programs may also be more likely to acquire and own more material possessions, potentially due to improved access to resources and knowledge that enhance their farming practices and was in compliance with Han *et al.*, 2010 [3]. Interestingly, Farming Commitment was negatively correlated with both Landholding and Annual Income. This could imply that as farmers become more committed to their farming practices, their landholding and income levels might not necessarily increase, possibly due to factors such as diminishing returns or constraints in land or resource expansion. Economic Motivation showed positive correlations with Social Participation, Age, and Farming Experience. This indicates that farmers who are economically motivated are also likely to be more socially involved and possess greater age and experience. These factors contribute to a stronger economic drive, suggesting that economic motivation in farming is influenced by social interactions, life experience, and accumulated knowledge.

Conclusion

This study provides valuable insights into the interplay between personal, socio-economic, and psychological characteristics of coconut farmers engaged in multi-storeyed farming systems. The analysis reveals that larger landholdings are strongly associated with higher annual incomes, emphasizing the economic advantages of expanded farming operations. Additionally, farming experience is closely linked with age, highlighting the role of accumulated knowledge over time. The positive correlation between extension participation and material possession suggests that active engagement in extension services can enhance resource acquisition and improve farming outcomes. However, the negative correlation between farming commitment and both landholding and income indicates that increased dedication to farming does not necessarily translate to greater financial or land resources, potentially due to constraints in scaling or resource availability. Economic motivation was positively related to social participation, age, and farming experience, suggesting that motivated farmers are likely to be more engaged and experienced, contributing to their economic drive. The study also highlights significant associations between market orientation and innovative as well as scientific approaches, underscoring the importance of market awareness and innovation in farming practices. Furthermore, change proneness was positively correlated with economic motivation and risk orientation, indicating that farmers who are more adaptable and open to change are also more motivated and willing to take risks. In conclusion, the complex relationships among these characteristics underscore the multifaceted nature of farming success. Understanding these interactions can aid in developing targeted interventions and support systems to enhance the efficiency and profitability of multi-storeyed coconut farming. Future research could explore the causal mechanisms underlying these relationships and evaluate the effectiveness of specific support measures for improving farming practices and outcomes.

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