



Comparative Analysis of Entrepreneurial Behaviour among Pokkali and Non-Pokkali Farmers in Kerala

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HIGHLIGHTS

- Pokkali farmers had a significantly higher level of entrepreneurial behaviour compared to non-pokkali farmers
- Extension contact and information sources were positively associated with entrepreneurial behaviour among Pokkali farmers.
- This valuable traditional system faces severe challenges, causing rapid decline and emphasizing the urgent need for immediate, targeted interventions.

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ABSTRACT

In Kerala's coastal districts of Ernakulam, Alappuzha, and Thrissur near the Arabian Sea, Pokkali rice farming is a long-standing, organic, traditional, and environmentally beneficial style of paddy production. The study was conducted in 2025 to compare the entrepreneurial behaviour between Pokkali and non-Pokkali farmers. A pre-tested interview schedule was used to gather primary data from 120 respondents and focus groups with key informants were conducted to validate the results. The Cronbach's alpha value obtained was 0.826 for the 31-item scale. The results revealed that Pokkali farmers exhibited significantly higher entrepreneurial behaviour compared to non-Pokkali farmers. Among Pokkali farmers, extension contact, source of information and social participation exhibited a positive and significant relationship with entrepreneurial behaviour. Despite its ecological and economic importance, Pokkali cultivation has declined considerably in recent years due to multiple constraints. Therefore, strengthening such traditional and integrated farming systems through targeted extension interventions, capacity building, institutional support, and conservation efforts may support the development of entrepreneurial competencies, improve livelihood security, and contribute to sustainable agricultural development.

INTRODUCTION

Rice (*Oryza sativa*) is the most important staple cereal, sustaining nearly two-thirds of the world's population. The livelihood of a large section of humanity depends on rice due to its high nutritive value and energy content (Burlando & Cornara, 2014). According to the Food and Agriculture Organization (FAO), global rice production during 2024–25 was estimated at 546.6 million tonnes, with India as the leading producer followed by China. In Kerala, paddy has traditionally been a major food crop; however,

the area under cultivation has declined drastically over time. From 8.82 lakh hectares in 1974–75, to 1.66 lakh hectares by 2019–20 (Sabu & Roy, 2024). In 2024–25, rice accounted for only 7.01 per cent of the total cropped area, with 1.76 lakh hectares under cultivation, producing 5.30 lakh tonnes with a productivity of 3,006 kg per hectare. The area under wetland paddy further declined marginally by 1.45 per cent, while production remained nearly constant (Kerala Economic Review, 2025).

The decline in paddy cultivation is attributed to factors such as land conversion, low profitability, inadequate institutional

support, rising labour wages, price fluctuations, fragmented holdings, and unscientific cultivation practices (Rejula et al., 2017; Jayaprada et al., 2023). This has resulted in a widening gap between demand and production, highlighting the need to revive sustainable and traditional farming systems. In the context of growing emphasis on organic agriculture, indigenous systems like Pokkali rice cultivation offer significant potential, particularly in stress-prone coastal ecosystems (Sudan et al., 2016).

Pokkali rice cultivation is a unique, eco-friendly farming system practiced in the saline tracts of Kerala. It involves cultivating salt-tolerant rice during the monsoon, followed by prawn farming in the same fields, forming a sustainable agri-aqua integration (Sreelatha et al., 2022a). The system depends on natural tidal flows and monsoonal patterns, establishing a symbiotic relationship between rice and aquatic organisms (Ranjith et al., 2018). In Kerala, where a considerable portion of paddy lands remain waterlogged, such integrated systems are common (Jayan & Sathyanathan, 2010). The traditional practice of prawn filtration (*Chemmeen Kettu*) enhances farm income and system efficiency. Pokkali cultivation is environmentally sustainable as it minimizes external inputs, conserves biodiversity, and avoids degradation of natural resources (Jose et al., 2023a). It is recognized as a model of sustainable agriculture integrating crop and aquaculture systems (Sumithra & Devi, 2025a).

Despite its advantages, Pokkali cultivation faces several challenges, including labour shortages, socio-economic constraints, and environmental pressures, leading to a sharp decline in area from 25,000 hectares to less than 5,000 hectares (Vikas et al., 2018). Scarcity of labour, particularly during harvesting, has been identified as a major constraint (Jose et al., 2023b). Given these challenges, there is a need to understand the role of such systems in shaping farmers' behaviour. Previous studies on Pokkali cultivation have predominantly focused on ecological sustainability, integrated rice-prawn production systems, economic benefits, and production constraints. However, limited empirical research has examined the entrepreneurial behaviour of farmers engaged in Pokkali cultivation. Entrepreneurial behaviour plays a crucial role in innovation adoption, risk management, market orientation, and enterprise development. Given the unique agro-ecological and management characteristics of the Pokkali farming system, differences in entrepreneurial behaviour may exist between Pokkali and non-Pokkali farmers. Therefore, the present study was undertaken to compare the entrepreneurial behaviour of Pokkali and non-Pokkali farmers in Kerala.

METHODOLOGY

The current study was conducted in the year 2025 in the state of Kerala. The study adopted an ex-post facto comparative research design to examine the differences in the entrepreneurial behaviour between Pokkali and non-Pokkali farmers. Since the variables under study had already occurred naturally and could not be manipulated experimentally, an ex-post facto approach was considered appropriate. Kerala has 16 districts out of which pokkali cultivation is practiced only in 3 districts, namely Ernakulam, Alappuzha and Thrissur. More than half (64.00%) of the total pokkali cultivation is practiced in the district of Ernakulam

(Sumithra & Devi, 2025b), therefore Ernakulam district was purposively selected for the present study. There are 14 RD blocks in Ernakulam district. Out of these blocks, North Paravur, Aluva and Kalamassery are popularly practicing pokkali cultivation and Mulanthuruthy with non-pokalli rice cultivation (Kerala Economic Review, Volume 2, 2025) blocks were purposively selected for the study. From the selected RD blocks, one village each from the three selected pokkali rice cultivated RD blocks were selected purposively for this study as per the availability of pokkali rice cultivators and three villages from non-pokkali cultivated RD block were selected randomly, to get a total of 6 villages for the present study. A total of 120 respondents was selected purposively for this study whereby 20 respondents were selected purposively from each pokkali paddy cultivated villages and 20 respondents each from non-pokkali paddy cultivated villages, thus, making it a total of 120. Data were collected through personal interviews using a structured and pre-tested interview schedule. Descriptive statistics such as frequency, percentage, mean and standard deviation along with chi-square test, correlation analysis and independent samples t-test were carried out using SPSS Version 16.0.

Chi-square test of independence was employed to examine the association between farmer type (Pokkali and non-Pokkali) and selected socio-economic characteristics of the respondents. The test was used to determine whether significant associations existed between the two groups with respect to variables such as age, education, landholding, area under cultivation, annual income, farming experience, extension contact, training exposure, social participation, and source of information.

The components of entrepreneurial viz. innovativeness, risk orientation, scientific orientation and marketing orientation were adopted with slight modifications (Bushetti & Krishnamurty, 2022). Necessary modifications were incorporated to improve clarity, relevance, and suitability of the statements. The schedule was pre-tested among non-sample respondents to ensure comprehensibility and applicability under field conditions. Reliability of the entrepreneurial behaviour scale was assessed using Cronbach's alpha coefficient. Each component was represented by a different number of statements with distinct scoring ranges. The statements were measured on five-point continuum ranging from strongly agree, agree, undecided, disagree and strongly disagree with weightage of 5, 4, 3, 2 and 1 respectively and was reversed in case of negative statements. The weighted responses of each statement were added up to determine the respondents' overall score for each component.

Pearson's correlation analysis was carried out to examine the association between entrepreneurial behaviour and socio-economic characteristics of the respondents. The analysis helped in identifying the degree and direction of association between the dependent and independent variables. Entrepreneurial behaviour among farmers is influenced by various socio-economic and psychological factors. Variables such as education, farming experience, landholding, annual income, and social participation are often associated with decision-making ability, access to information, risk-bearing capacity, innovation adoption, and market orientation. Farmers with better educational exposure and resource availability are generally more capable of adopting innovative practices and responding to market opportunities. Therefore, selected socio-economic variables were

examined to understand their relationship with entrepreneurial behaviour among Pokkali and non-Pokkali farmers.

Independent samples t-test was used to compare the entrepreneurial behaviour of Pokkali and non-Pokkali farmers and to determine whether significant differences existed between the two groups. Preliminary analyses were conducted to assess the assumptions of the independent samples t-test. The Shapiro–Wilk test indicated a slight deviation from normality among Pokkali farmers ($W = 0.946$, $p = 0.011$), whereas the distribution among non-Pokkali farmers was normal ($W = 0.983$, $p = 0.558$). Given the sample size of 60 respondents in each group, the t-test was considered sufficiently robust. Levene’s test indicated unequal variances between the groups ($F = 27.861$, $p < 0.001$); therefore, the results corresponding to the “equal variances not assumed” condition were interpreted.

RESULTS

Association between farmer type and socio-economic characteristics

The association between farmer type and selected socio-economic characteristics was assessed using Chi-square test. The results revealed that educational status, land holding, area under cultivation, extension contact, and training exposure showed significant association with farmer type. However, age, annual income, farming experience, social participation, and source of information did not differ significantly between Pokkali and non-Pokkali farmers, indicating comparability of the groups with respect to these characteristics. Since significant differences were observed in selected socio-economic characteristics between the two groups, the findings were interpreted with due consideration of potential confounding effects.

Table 1. Association between farmer type and socio-economic characteristics

Variables	χ^2 value	p-value
Age	1.046	0.593
Education	13.488	0.036*
Land holding	29.408	<0.001**
Area under cultivation	37.059	<0.001***
Annual income	0.057	0.972
Farming experience	0.500	0.779
Extension contact	32.528	<0.001**
Training exposure	84.324	<0.001**
Social participation	0.569	0.752
Source of Information	1.118	0.572

*Significant at 5 per cent level ($p < 0.05$); **Significant at 1 per cent level ($p < 0.01$)

Reliability statistics of entrepreneurial behaviour scale

Reliability analysis of the entrepreneurial behaviour scale was carried out using Cronbach’s alpha coefficient to assess the internal consistency of the instrument. The Cronbach’s alpha value obtained was 0.826 for the 31-item scale, indicating good reliability and satisfactory internal consistency of the instrument used in the study.

Table 2. Reliability statistics of entrepreneurial behaviour scale

Particulars	Value
Cronbach’s Alpha	0.826
Number of items	31

Relationship between entrepreneurial behaviour and socio-economic variables

Correlation analysis was carried out to examine the relationship between entrepreneurial behaviour and selected socio-economic characteristics of Pokkali and Non-Pokkali farmers. The results of the correlation coefficients indicating the significant relationships between entrepreneurial behaviour and the selected characteristics of the respondents are presented in Table 3.

Among Pokkali farmers, extension contact ($r = 0.576$) and source of information ($r = 0.387$) exhibited a positive and highly significant relationship with entrepreneurial behaviour, while social participation ($r = 0.263$) showed a positive and significant relationship. The findings indicate that greater interaction with extension agencies, better access to information sources and higher social participation were positively associated with entrepreneurial behaviour among Pokkali farmers.

In contrast, none of the selected socio-economic variables showed a significant relationship with entrepreneurial behaviour among non-Pokkali farmers.

Table 3. Relationship between entrepreneurial behaviour and socio-economic variables

Variables	Pokkali	Non-Pokkali
Age	0.026	0.042
Education	-0.115	-0.105
Land holding	0.193	0.083
Area under cultivation	0.161	0.120
Annual income	0.045	-0.217
Farming experience	-0.038	0.191
Extension contact	0.576**	-0.163
Training exposure	0.101	0.028
Social participation	0.263*	-0.033
Source of Information	0.387**	0.087

*Significant at 5 per cent level; **Significant at 1 per cent level

Note: No significant relationship was observed among non-Pokkali farmers.

Comparison of entrepreneurial behaviour between Pokkali and non-Pokkali farmers

The independent samples t-test revealed a highly significant difference in entrepreneurial behaviour between Pokkali and non-Pokkali farmers, $t(84.34) = 53.165$, $p < 0.001$. Pokkali farmers recorded significantly higher entrepreneurial behaviour scores (221.02 ± 11.32) than non-Pokkali farmers (134.98 ± 5.38). The mean difference was 86.03 points (95% CI: 82.82–89.25), with an extremely large effect size (Cohen’s $d = 9.74$).

DISCUSSION

The findings revealed significant differences between Pokkali and non-Pokkali farmers with respect to several socio-economic and

Table 4. Comparison of entrepreneurial behaviour between Pokkali and non-Pokkali farmers

Variable	Pokkali (Mean ± SD)	Non-Pokkali (Mean ± SD)	<i>t</i> - value	df	<i>p</i> - value	95% CI	Cohen's <i>d</i>
Entrepreneurial behaviour	221.02 ± 11.32	134.98 ± 5.38	53.165	84.34	<0.001**	82.82 – 89.25	9.74

entrepreneurial characteristics. The Chi-square analysis indicates that educational status, land holding, area under cultivation, extension contact and training exposure are significantly associated with farmer type, whereas age, annual income, farming experience, social participation and source of information do not differ significantly between the groups. Similar observations are reported in studies where education, landholding and extension-related variables are positively associated with entrepreneurial behaviour among farming communities (Patil et al., 2017; Sharma et al., 2019). The significant association of training exposure with farmer type highlights the importance of capacity-building programmes in fostering entrepreneurial behaviour. Entrepreneurship-oriented training enhances knowledge, skills and confidence required for enterprise development. Similar findings were reported by Sharma and Singh (2023), who observed substantial improvement in entrepreneurial competencies following entrepreneurship training programmes, and by Kumari et al. (2025), who emphasized the role of agribusiness training in strengthening entrepreneurial capabilities among agripreneurs. Kobba et al. (2021) observed in the farm sector, four determinants of entrepreneurial success were family size, land size, turnover and annual income whereas in the non-farm sectors five determinants of entrepreneurial success were long term involvement, initiative, number of employees, entrepreneurial experience and annual income. Kademani et al. (2026) reported that operational elements such as training institute-industry market-entrepreneur linkages, administrative commitments, and policy consistency, collectively shaped intervention effectiveness across the entrepreneurial ecosystems.

The reliability analysis demonstrates that the entrepreneurial behaviour scale possesses good internal consistency, as indicated by the Cronbach's alpha value of 0.826. This confirms that the modified instrument reliably measures entrepreneurial behaviour and provides consistency in assessing the entrepreneurial characteristics of the respondents.

The correlation analysis reveals a clear trend among Pokkali farmers. Extension contact exhibits a positive and highly significant relationship with entrepreneurial behaviour, followed by source of information and social participation (Pisure et al., 2014). These findings indicate that farmers who maintain regular interaction with extension agencies, actively participate in social organizations and access multiple information sources tend to display stronger entrepreneurial behaviour (Pongener & Jha, 2024). Extension systems facilitate knowledge acquisition, exposure to innovations and improved decision-making, thereby strengthening entrepreneurial competencies (Kapadnis & Thoke, 2024; Gudla et al., 2026).

An important exception emerges among non-Pokkali farmers, where none of the selected socio-economic variables show a significant relationship with entrepreneurial behaviour. This suggests that entrepreneurial behaviour within this group may be influenced

by factors beyond the variables included in the present investigation. Psychological attributes, market opportunities, risk perception, enterprise diversification and local institutional support may play a greater role in determining entrepreneurial orientation among non-Pokkali farmers. The absence of significant relationships also indicates that conventional socio-economic variables alone may not adequately explain entrepreneurial behaviour in all farming contexts. Diversified systems provide exposure to multiple income sources and management practices, thereby facilitating the development of entrepreneurial competencies (Nain et al., 2019; Sreelatha et al., 2022b). Farmers engaged in diversified farming systems tend to exhibit higher entrepreneurial orientation and adaptability (Shahbaz et al., 2023; Rizzo et al., 2023; Wang et al., 2023; Thakur et al., 2025). In contrast, non-Pokkali farmers largely depend on monocropping systems, which may restrict opportunities for innovation and market engagement.

The independent samples t-test further reveals a highly significant difference between the two groups with respect to entrepreneurial behaviour. Pokkali farmers record substantially higher entrepreneurial behaviour scores than non-Pokkali farmers. This finding suggests that the specialized nature of Pokkali cultivation is associated with greater innovativeness, management ability, market orientation and decision-making capacity. Pokkali farming is characterized by unique agro-ecological conditions and often requires continuous adaptation, technical guidance and institutional interaction, which may strengthen entrepreneurial attributes among farmers. This finding is in agreement with Mukharjee and Ghosh (2025), who reported that institutional support, knowledge access and enterprise-related exposure positively influence entrepreneurial behaviour among agricultural entrepreneurs.

Overall, the findings indicate that entrepreneurial behaviour is more strongly shaped by informational and institutional factors than by basic demographic characteristics. The results emphasize the importance of strengthening extension contact, training programmes and information dissemination mechanisms to enhance entrepreneurial behaviour among farming communities, particularly among non-Pokkali farmers who appear to benefit less from these support systems.

CONCLUSION

Entrepreneurial behaviour among Pokkali farmers exhibited a positive and significant relationship with extension contact, social participation and access to information sources, highlighting the importance of institutional and informational support in fostering entrepreneurial competencies. Significant differences were also observed between the two groups with respect to education, landholding, area under cultivation, extension contact and training exposure. The entrepreneurial behaviour is associated with extension services, capacity-building programmes and access to

information. Enhancing training opportunities, extension outreach and information dissemination mechanisms may support the development of entrepreneurial behaviour among farming communities.

DECLARATIONS

Ethics approval and informed consent: Throughout the study, the respondents were asked for their informed consent.

Conflict of interest: The research was carried out without any financial or commercial ties that might be seen as a potential conflict of interest, according to the authors. The authors affirm that they carefully examined, amended and edited the content as necessary when preparing this work. The final content of this publication is entirely the authors' responsibility.

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