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Behavioural Determinants of Secondary Agriculture-based Entrepreneurs in Assam

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HIGHLIGHTS

- Younger, educated entrepreneurs with stable households show stronger entrepreneurial behaviour.
- Income and investment were positively and significantly correlated with entrepreneurial behaviour.
- Mass media exposure significantly enhanced entrepreneurial behaviour.
- Economic motivation was the strongest predictor, followed by deferred gratification and value orientation.

ARTICLE INFO

Keywords: Secondary agriculture, Entrepreneurship, Entrepreneurial behaviour, Rural entrepreneurship.

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ABSTRACT

Rural India still struggles with income gaps. Secondary agriculture serves as a strategic path to promote efficient rural entrepreneurship. The study was conducted in 2024 in Assam's Dhubri district employing a mixed-method research design that examined variations in entrepreneurial attributes across secondary agricultural enterprises, based on data from 100 respondents representing five enterprises. Entrepreneurial behaviour showed positive correlations with factors like education, income, investment, media use, aspiration, motivation, gratification, and values, and a negative correlation with age. Multiple regression analysis explained 72.8 per cent of entrepreneurial behaviour (adjusted $R^2 = 0.645$). Using principal component analyses (PCA) and Varimax rotation, 23 entrepreneurial attributes were grouped and renamed into seven factors. The strategic policy advocacy to enhance entrepreneurs' holistic development should prioritize these key attributes of secondary agriculture-based entrepreneurs to improve their entrepreneurial behaviour.

INTRODUCTION

Despite India achieving self-sufficiency in food grain production, the processing of agricultural produce remains minimal, accounting for less than ten percent (Suhas & Dolli, 2023). Numerous stakeholders are now prioritizing agri-entrepreneurship as a key driver of innovation and socio-economic progress in the agricultural sector (Kademani et al., 2024). Despite constituting around 86 per cent of India's farmers and producing nearly 60 per cent of its agricultural output, small and marginal farmers face persistent financial instability, with incomes scarcely covering basic expenses and limiting opportunities for savings or better living standards (Boppana & Reddy, 2023). In India, approximately 63 per cent of the total population resides in rural areas (World Bank Report, 2023), where agriculture and allied activities serve as the primary source of livelihood. The notion of farmer income transcends mere physical yield, emphasising the importance of returns per man-day rather than output per area. As agricultural growth and development strategies evolve, there is a need to investigate opportunities for fostering rural entrepreneurship across agriculture and allied sectors (Kharga, 2021). Hence, augmenting secondary agricultural endeavours becomes imperative to optimise resource utilisation and foster sustainable agricultural growth.

The notion of 'secondary agriculture' in India lacks a clear definition and is generally linked to agro-based manufacturing. Although the Planning Commission formed a Technical Advisory Committee on Secondary Agriculture (TACSA) in 2007, and its 2008 report highlighted the importance of the sector, the committee

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did not offer a specific definition. Instead, it interpreted the term broadly to include all bio-resource-based products–both food and non-food–used for human consumption and industrial purposes.

A decade later, in 2018, a report by the Ashok Dalwai Committee recognised the growing relevance of secondary agriculture and defined it as "adding value to primary agriculture and building agricultural enterprises in rural India" through "farm-linked activities and secondary agriculture". Secondary agriculture involves a diverse range of activities and enterprises closely tied to farming, aiming to harness and optimise financial, human, and technological resources along with organisational expertise and effective risk management strategies (Das & Ghosh, 2023). Ashok Dalwai committee's report further categorised secondary agriculture into three different avenues, viz., Type A (Value addition to Primary Agriculture Production Systems), Type B (Alternative Enterprises) and Type C (Enterprises that use crop residues and wastes of Primary Agriculture) (Dalwai, 2018).

According to the Census of India (2011), the Northeastern region of India, despite encompassing 7.7 per cent of the nation's land area, contributes only 1.6 per cent to the country's industrial footprint. Assam, a central state in this region, holds strategic importance due to its abundant natural resources (Khan, 2024). However, these resources remain largely underutilised due to various constraints (Upadhyaya, 2022). Studies highlight that the off-farm ventures hold a promising avenue for boosting farmer incomes in Assam, suggesting substantial potential for the state to uplift rural livelihoods (ILRT India, n.d.). Therefore, the present investigation centres on entrepreneurs engaged in secondary agricultural enterprises. It will aid in unravelling the key attributes of these entrepreneurs, identify influential factors driving secondary agriculture and ultimately facilitate robust policy formulation.

METHODOLOGY

The study was conducted in Assam. Dhubri District was purposively selected out of 35 districts of Assam known for its cultural diversity and linguistic plurality, reflecting the composite heritage of the region (Tiwari, 2024). The rich cultural tapestry of a region would aid in fostering and promoting rural entrepreneurship through secondary agriculture (Singh et al., 2017). From Dhubri's 12 blocks, two blocks–Rupshi and Dharmasala–were randomly selected for the research. Five distinct rural enterprises involved in secondary agricultural activities were randomly chosen across three avenues of secondary agriculture. The selected enterprises included *Mora* (Bamboo cane stool) Making (Enterprise 1) Bamboo Basket Weaving (Enterprise 2), Thread Processing (Enterprise 3), *Gamucha* (a handwoven, rectangular piece of cloth, typically made of cotton, and is a significant cultural symbol of Assam) Weaving (Enterprise 4), and Shola craft products using discarded fish packing box made with Thermocols (Enterprise 5). From each enterprise, 20 entrepreneurs were randomly selected to participate in the study, bringing the total number of respondents engaged in secondary agriculture to 100.

A pilot study was conducted in the chosen district, using informal discussions to capture essential insights into entrepreneurs' socio-economic contexts, types of enterprises, and operational challenges. These findings helped shape the final research design. Key study variables were identified and broadly categorised into four aspects, viz., socio-personal, socio-economic, communicational and psychological attributes, through a thorough literature review and expert consultations, aligning with the investigation's core objectives. The assessment of entrepreneurial behaviour in this study is based on six core dimensions: innovativeness, achievement motivation, decision-making ability, risk-taking ability, planning ability, and self-confidence. These components were selected through a triangulated approach combining theoretical grounding and empirical precedent. Theoretically, the framework draws from McClelland's Achievement Motivation Theory (McClelland, 2015), which identifies achievement orientation and risk propensity as foundational traits of entrepreneurs. Empirically, studies such as Shirur et al., (2019) have operationalised these six dimensions in agricultural contexts, demonstrating their relevance and measurability among rural entrepreneurs. The Entrepreneurial behaviour was quantified using a composite index approach, where the index of individual components was assessed separately and then aggregated to derive an overall score. Data collection was executed using a structured interview schedule tailored to the research objectives. Respondents were interviewed over a span from October 2023 to February 2024. The gathered data were processed and analysed utilising Microsoft Excel and SPSS version 23.0.

Statistical tools like mean, standard deviation, frequency & percentage were employed to understand the distribution pattern of the respondents in different categories of variables. Enter multiple regression analysis was carried out considering entrepreneurial behaviour as the dependent variable and selected attributes as the independent variables. Factor analysis was used to analyse the interrelationships among the set of various attributes and represent latent dimensions that account for the shared variance.

RESULTS

Entrepreneurial behaviour represents a specific dimension of entrepreneurial activity that focuses on analysing, anticipating, and shaping individual actions within entrepreneurial contexts. Figure 1 reveals that the six key aspects of entrepreneurial behaviour differ across the five enterprises engaged in secondary agricultural activities. Among the assessed traits, achievement motivation was most pronounced, with a majority of entrepreneurs scoring above 80 per cent, and the highest reaching 92 per cent. Notably, entrepreneurs from Enterprise 1 exhibit the highest degree of achievement motivation. The trait of innovativeness also ranks relatively high, with more than 70 per cent of participants showing significant creative initiative. However, the capacity for risk-taking appears to be the weakest among the six behavioural dimensions.

As evidenced in Table 1, a range of socio-economic and psychological variables demonstrated a statistically significant positive correlation with entrepreneurial behaviour at the 1% significance level. These include education, household status, economic status, average annual income, level of enterprise investment, resource position, and frequency of mass media engagement. In addition, key psychological constructs–such as aspirational level, economic motivation, deferred gratification, and value orientation–were also positively associated with entrepreneurial engagement. Conversely, the variable of age revealed

Table 1. Correlation between attributes of entrepreneurs based on secondary agriculture and entrepreneurial behaviour

	Correlation Coefficient (r)
Attributes of the Entrepreneur	Entrepreneurial Behaviour
Age (X1)	-.358**
Education (X2)	.464**
Family type (X3)	0.030
Family size (X4)	-0.038
Male earning member (X5)	0.103
Female earning member (X6)	0.024
Earning member of family (X7)	0.118
Organization participation (X8)	0.144
Household status (X9)	.498**
Economic status (X10)	.365**
Average annual income (X11)	.379**
Enterprise investment (X12)	.354**
Experience (X13)	-0.020
Resource position (X14)	.338**
Credit orientation (X15)	0.180
Market orientation (X16)	0.064
Mass media use (X17)	.499**
Personal cosmopolite information use (X18)	-0.051
Personal localite information use (X19)	-0.086
Level of aspiration (X20)	.529**
Economic motivation (X21)	.669**
Deferred gratification (X22)	.608**
Value orientation (X23)	.359**

*significant at 5% level of significance, **significant at 1% level of significance

a significant negative correlation, suggesting that younger individuals may be more inclined toward entrepreneurial activities compared to their older counterparts. This pattern underscores the multifaceted nature of entrepreneurial behaviour, shaped by both structural conditions and individual-level psychological drivers.

Table 2 reveals that all 23 independent variables have an R-squared value of 0.728, and the adjusted R-squared value is 0.645, which means that the 23 variables have contributed 72.8 per cent of the total variation in entrepreneurial behaviour. Entrepreneurs with relatively high educational qualifications, organisational participation, household status and mass media usage have showcased greater entrepreneurial behaviour than others. It also revealed that entrepreneurs with greater economic motivation and deferred gratification have significantly high entrepreneurial behaviour. Organisational participation has depicted negative effects on entrepreneurial behaviour.

In Table 3, it was observed that the 23 attributes (variables) of the entrepreneurs were categorized into seven components. Component 1 is most significant and comprises seven attributes viz., average annual income, economic status, level of aspiration, household status, enterprise investment, resource position, economic motivation with eigenvalue of 5.250, a per cent of the variance of 22.828 and the cumulative per cent of 22.828 is explained. This component was renamed as "Entrepreneurial economy". Component two had an eigenvalue of 3.304 and the variance explained was 14.365 per cent with cumulative per cent of 37.193. This component was made up of five items, namely age, education, value orientation, mass media and deferred gratification, and it was renamed as "Entrepreneurial personality". The third component comprised four attributes, which were male earning member, family size, family type and earning member of family that had an eigenvalue of 2.724, and a per cent of the variance of 11.843 and the cumulative per cent of 49.036 was explained. This component was renamed as "Entrepreneurial family pattern". The fourth component was renamed as "Gender dynamics" which had an eigenvalue of 1.736, the variance explained was 7.55 percent and the cumulative per cent was 56.586. The two attributes under this component that were female earning members and experience. The fifth component comprised of two attributes viz., market orientation and personal localite, with an eigenvalue of 1.471, a percent of the variance of 6.397 was explained and the cumulative percent was 62.983. This component was renamed as "Entrepreneurial marketing". Personal cosmopolite and organization participation together constituted the sixth component with an eigenvalue of 1.255, the variance explained was 5.458 per cent and the cumulative per cent was 68.440 and was renamed as

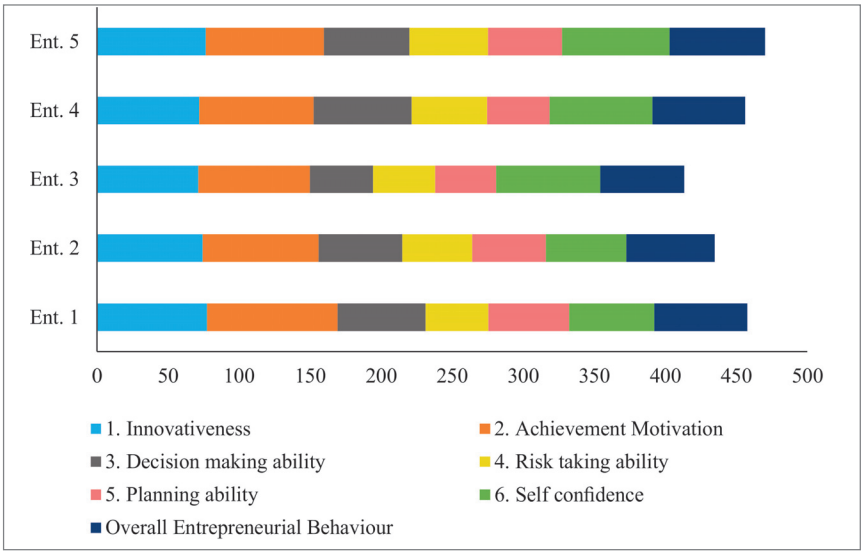

Figure 1. Differential entrepreneurial behaviour of various secondary agriculture-based entrepreneurs

Table 2. Multiple regression between entrepreneurial behaviour (dependent variable) and attributes of entrepreneurs

Model Summary					
Model	R	R Square	Adjusted R Square		Std. Error of the Estimate
1	.853	.728	.645		4.218
Coefficients					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.549	11.341		.048	.962
Age (X1)	.070	.067	.133	1.041	.301
Education (X2)	1.309	.591	.216	2.214	.030
Family type (X3)	1.826	1.698	.118	1.076	.285
Family size (X4)	-1.561	1.587	-.120	-.984	.328
Male earning member (X5)	1.017	5.312	.093	.191	.849
Female earning member (X6)	2.656	4.815	.208	.552	.583
Earning member of family (X7)	-1.705	5.050	-.183	-.338	.737
Organization participation (X8)	-1.568	.611	-.199	-2.564	.012
Household status (X9)	2.577	1.064	.239	2.421	.018
Economic status (X10)	-1.680	1.745	-.108	-.963	.339
Average annual income (X11)	2.448E-05	.000	.243	1.704	.092
Enterprise investment (X12)	.000	.001	-.021	-.184	.854
Experience (X13)	.108	.092	.151	1.174	.244
Resource position (X14)	.046	.137	.026	.333	.740
Credit orientation (X15)	.228	.325	.056	.703	.484
Market orientation (X16)	1.519	2.677	.042	.567	.572
Mass media use (X17)	.465	.227	.188	2.053	.043
Personal cosmopolite information use (X18)	1.005	.671	.120	1.498	.138
Personal localite information use (X19)	-.207	.181	-.082	-1.145	.256
Level of aspiration (X20)	-.071	.255	-.036	-.277	.782
Economic motivation (X21)	1.423	.501	.310	2.843	.006
Deferred gratification (X22)	.769	.262	.297	2.937	.004
Value orientation (X23)	.894	.477	.156	1.873	.065

"Organisational interaction". The last component had an eigenvalue of 1.077 with a per cent of variance 4.683, along with a cumulative per cent of 73.124. This component had only one variable i.e., credit orientation, and thus it is named as "Credit orientation".

DISCUSSION

The present study reveals that a majority of respondents exhibit a moderate level of entrepreneurial behaviour, which aligns with earlier findings by Mudoi et al., (2020) and Shivacharan et al., (2015), who reported similar behavioural distributions among rural agri-entrepreneurs in Assam and Telangana, respectively. However, the study also highlights relatively low levels of risk-taking behaviour, which may be attributed to socio-cultural norms that discourage financial risk, economic insecurity, and limited access to safety nets. This finding resonates with Keshari et al., (2024), who noted that farmers often exhibit risk-averse tendencies due to uncertain market conditions and lack of institutional support. Moreover, Shivacharan et al., (2015) observed that despite high economic motivation, many rural entrepreneurs refrain from taking bold financial decisions, preferring incremental growth strategies. Interestingly, the current study finds that younger entrepreneurs tend to display higher levels of entrepreneurial behaviour, particularly in domains such as planning ability and self-confidence. This observation aligns with Kobba et al., (2020), who reported that younger individuals in both farm and non-farm sectors are more adaptive, tech-savvy, and open to innovation. However, Sahu (2022) observed that older farmers in Chhattisgarh demonstrated higher persistence and manageability, contradicting the assumption that youth always correlate with stronger entrepreneurial behaviour. Additionally, entrepreneurs with strong economic and resource positions–such as access to capital, land, and market linkages–exhibit significantly higher entrepreneurial behaviour. This supports the findings of Gupta et al., (2019) & Nain et al., (2024) who emphasized the role of financial stability and resource availability in enhancing entrepreneurial performance. Entrepreneurs having greater mass media usage tend to show significant entrepreneurial behaviour as compared to others (Gupta et al., 2019). However, Deepa (2022) found that excessive reliance on media discouraged risk-taking among rural entrepreneurs, who became more cautious after exposure to negative case studies. In the current research, the psychological attributes namely level of aspiration, economic motivation, deferred gratification and value orientation displays positively strong correlation with the entrepreneurial behaviour and thus it is evident that entrepreneurs pursuing strong psychological

Table 3. Factor analysis of the attributes of entrepreneurs

Factor No.	Variables	Eigenvalue	Variance explained (%)	Cumulative (%)	Factor loading value	Factor renamed
1	Average annual income (X11)	5.250	22.828	22.828	.821	Entrepreneurial economy
	Economic status (X10)				.813	
	Level of aspiration (X20)				.797	
	Household status (X9)				.687	
	Enterprise investment (X12)				.644	
	Resource position (X14)				.596	
	Economic motivation (X21)				.508	
2	Age (X1)	3.304	14.365	37.193	.835	Entrepreneurial personality
	Education (X2)				.738	
	Value orientation (X23)				.686	
	Mass media (X17)				.673	
	Deferred gratification (X22)				.559	
3	Male earning member (X5)	2.724	11.843	49.036	.899	Entrepreneurial family pattern
	Family size (X4)				.898	
	Family type (X3)				.866	
	Earning member of family (X7)				.769	
4	Female earning member (X6)	1.736	7.550	56.586	.888	Gender dynamics
	Experience (X13)				.628	
5	Market orientation (X16)	1.471	6.397	62.983	.785	Entrepreneurial marketing
	Personal localite (X19)				.429	
6	Personal cosmopolite (X18)	1.255	5.458	68.440	.845	Organizationalinteraction
	Organization participation (X8)				.573	
7	Credit orientation (X15)	1.077	4.683	73.124	.851	Credit orientation

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.643; Bartlett's Test of Sphericity = 1536.178

attributes establishes good entrepreneurial climate (Kumari et al., 2025; Gupta et al., 2023). Enter regression model displayed significant role in analysing the functional relationship between attributes of entrepreneurs and entrepreneurial behaviour, where the difference between R square and adjusted R square is 0.083. The attributes of the entrepreneurs, i.e., 23 variables, have been organized into seven distinct groups. This is achieved through factor analysis, employing Principal Component Analysis (PCA) for extraction and Varimax rotation, alongside the Kaiser-Meyer-Olkin Measure of Sampling Adequacy, which stands at 0.643. The extraction method determined the initial factors based on the variance of the data and interpreted the factors where all the components had eigenvalue greater than one aligning with the findings of Shirur et al., (2019) who applied PCA and Varimax rotation to assess entrepreneurial traits among mushroom growers, identifying distinct behavioural dimensions that were both statistically and contextually coherent. Similarly, Keshari et al., (2024) emphasized the utility of factor analysis in isolating psychological and socio-economic determinants of entrepreneurial behaviour in rural India, reinforcing the methodological relevance of this approach.

CONCLUSION

Rural entrepreneurship is vital for India's economic growth, given its large rural population. Despite post-independence government initiatives, many efforts have failed to meet their goals, highlighting the need for more effective support strategies. Secondary agricultural activities offer significant potential to enhance rural incomes and improve living standards. To maximize their impact, rural entrepreneurial development programs must be critically evaluated and realigned to better integrate these activities, ensuring more effective outcomes in rural communities. The study reveals that while entrepreneurs often exhibit strong achievement motivation and a flair for innovation, they may lack sufficient risk tolerance and strategic foresight. To bridge this gap, policymakers and development agencies should prioritize context-sensitive initiatives that reflect the unique challenges and opportunities of local entrepreneurial ecosystems. Hence, emphasizing targeted entrepreneurial traits is therefore crucial for formulating and enacting policies that can effectively advance secondary agricultural enterprises and foster comprehensive rural development.

DECLARATIONS

Ethics approval and informed consent: Informed consent was sought from the respondents during the course of the research.

Conflict of interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The authors declare that during the preparation of this work, thoroughly reviewed, revised, and edited the content as needed. The authors take full responsibility for the final content of this publication.

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