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Pathways to farmers' entrepreneurship: the role of entrepreneurial mindset

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Purpose: This study explores farmers' entrepreneurial mindset, specifically its role in mediating the relationship between motivation, communication, risk factors, and entrepreneurial intentions.

Methodology: The study was conducted in Tamil Nadu, India, with 201 farmers from four districts. The study performed Structural Equation Modeling (SEM) using SmartPLS 4. To examine the relationships, confirmatory factor analysis and path analysis with bootstrapping were employed.

Findings: The findings reveal that economic motivation and risk orientation significantly enhance entrepreneurial intentions through mindset dimensions such as autonomy, proactiveness, and risk-taking. Proactiveness and risk-taking behaviors significantly influence farmers' entrepreneurial intentions in value-added activities like rice processing and oil extraction. Innovativeness, however, had no significant direct impact. Farm type (rice vs. groundnut farming) significantly moderates the relationship between risk-taking and farmers' entrepreneurial intentions.

Originality: This research offers unique insights into the entrepreneurial mindset of farmers in a developing region, emphasizing the importance of mindset dimensions in driving entrepreneurial intention, particularly in value-added agricultural activities.

Implications: The study suggests policymakers should integrate financial incentives, risk management training, and communication programs to enhance farmers' entrepreneurial intentions. Financial support programs like subsidies and microloans can strengthen economic motivation, while entrepreneurship training can enhance opportunity recognition, risk assessment, and strategic decision-making.

KEYWORDS

entrepreneurial factors, farmers, SmartPLS, structural equation modeling, psychological traits

1 Introduction

The psychosocial capacity-building of smallholder farmers in entrepreneurship is a critical area of study with far-reaching implications for poverty alleviation, food security, and environmental sustainability. Farmers, particularly in developing regions, contribute significantly to agricultural production but face challenges such as limited market access, inadequate financial services, and technological shortcomings (Mustaffa et al., 2019; Raza et al., 2024). These constraints often hinder their entrepreneurial mindset,

undermining their capacity to innovate and sustain livelihoods. By fostering an entrepreneurial mindset and addressing these barriers, agri-entrepreneurship can serve as an approach to enhance income, improve food security, and promote sustainability (Tindiweni et al., 2021; Vadjunec et al., 2016).

Farmers' entrepreneurship is a pillar of rural economies' empowerment, particularly in developing regions where agriculture is the primary livelihood. Despite their vital role in food production and economic development, small-holders often encounter resource limitations, knowledge gaps, and environmental constraints (Raza et al., 2024), insufficient access to financial resources, infrastructure, and modern technologies, as well as limited business and market knowledge that impede their entrepreneurial endeavors (Manyise et al., 2023; Raza et al., 2024). Climate change and market volatility further exacerbate their vulnerabilities (Cheber, 2018). However, collective action and commercialization have emerged as promising avenues to unlock entrepreneurial potential. Cooperatives and collective enterprises enable smallholders to pool resources, reduce transaction costs, and enhance market access (Akiode, 2020; Malik and Kajale, 2024), while market-oriented production can significantly improve income and livelihoods (Cheber, 2018). Addressing systemic barriers through supportive ecosystems and policy interventions remains crucial for sustainable empowerment.

In India, farmers face profound challenges that hinder their recognition as entrepreneurs, despite possessing entrepreneurial traits, which are foundational for entrepreneurship (Chaudhary et al., 2023). These challenges are further exacerbated by global crises, including the COVID-19 pandemic and geopolitical conflicts, which intensify their vulnerabilities (Yadav, 2021). However, entrepreneurship extends beyond formal education or material resources; it is fundamentally influenced by entrepreneurial traits and mindsets (Kurjono et al., 2020). Factors such as economic motivation, risk orientation, information-seeking behavior, and achievement motivation significantly shape entrepreneurial intentions, even among individuals traditionally not categorized as entrepreneurs (Anjum et al., 2024; Ndofirepi, 2020). These traits often remain untapped due to limited education, inadequate financial resources, and restricted access to modern technologies. Such constraints suppress their ability to innovate and seize entrepreneurial opportunities (Sathya, 2019; Chaudhary et al., 2023; Vijaya Kumar, 2016). This study addresses these gaps by exploring how entrepreneurial traits influence farmers' entrepreneurial intentions through the mediating effect of entrepreneurial mindset dimensions and moderating factors. This approach highlights the often-unrecognized entrepreneurial mindset of farmers. The research seeks to highlight how motivational factors, communication factors, and risk orientation influence entrepreneurial intention. Additionally, the study examines the moderating effects of gender and farm type on entrepreneurial intention and mindset development.

1.1 Theoretical framework

This study integrates the Theory of Planned Behavior (TPB) to explain how the entrepreneurial mindset influences entrepreneurial intention. Additionally, the Stimulus-Organism-Response (S-O-R)

theory illustrates how external factors shape this mindset. Together, these theories comprehensively understand the factors driving entrepreneurial intention.

1.2 Theory of planned behavior

The Theory of Planned Behavior (TPB) (Ajzen, 1991) provides a theoretical framework for understanding the link between the entrepreneurial mindset and entrepreneurial intention. Rooted in the idea that human behavior is guided by rational decision-making, the TPB argues that the execution of a specific behavior is influenced by the intention to perform it (Ajzen, 1991). Therefore, when individuals recognize the available opportunities, they can secure the necessary resources and take action to achieve the intended behavior (Cater et al., 2023). This theory has been widely applied to explore how the entrepreneurial mindset significantly influences entrepreneurial intention (Cater et al., 2023; Gabi et al., 2018; Liao et al., 2022; Özlem et al., 2028; Thuc, 2024). Among farmers, these dimensions play a crucial role in shaping their intention to engage in entrepreneurial activities, particularly in the value-added of their cultivated product. Farmers with a strong entrepreneurial mindset are likelier to take initiative, innovate, and take calculated risks to earn more profit.

1.3 Stimulus-Organism-Response theory

This study uses the Stimulus-Organism-Response (S-O-R) theory to explain how external factors shape the entrepreneurial mindset, influencing entrepreneurial intention. The S-O-R theory is a behavioral psychology theory that explains how external stimuli affect a person's internal state (organism), which then leads to a behavioral response (Larsen et al., 2023). In this case, motivational, communication, and risk factors serve as stimuli (S) that shape the entrepreneurial mindset (O), which then influences entrepreneurial intention (R). The existing literature states that motivational factors, such as economic motivation and achievement motivation, influence the entrepreneurial mindset dimension, especially by enhancing autonomy, proactiveness, and innovativeness, enabling individuals to recognize and pursue entrepreneurial opportunities (Lehberger and Grüner, 2022; Olubodun et al., 2024); Communication factors, particularly information-seeking behavior, play a critical role in enhancing innovativeness and risk-taking by equipping farmers with the knowledge, networks, and insights necessary for decision-making (Ramadhanti and Etikariena, 2024); then risk orientation further strengthens the entrepreneurial mindset by enhancing risk-taking, a key component of entrepreneurial ventures (Messikh, 2022; Nafees et al., 2022). These factors collectively nurture an entrepreneurial mindset.

This theoretical framework builds on TPB by demonstrating that entrepreneurial intention is influenced by both the direct effect of the entrepreneurial mindset and the indirect impact of motivational, communication, and risk factors through the S-O-R theory. The entrepreneurial mindset serves as a mediator between motivational, communication, and risk factors and entrepreneurial

intention. Farmers who experience strong external stimuli, such as financial incentives, access to market information, and a willingness to take risks, develop a mindset that fosters autonomy, a need for achievement, and proactiveness. This mindset, in turn, strengthens their entrepreneurial intention by increasing their confidence and perceived ability to start and manage a business (Ozigi et al., 2023; Samjuannita and Puspitowati, 2023; Shukla and Kumar, 2024; Steenkamp et al., 2023; Tentama et al., 2024; Zhao et al., 2010). In this theoretical framework, gender (male vs. female) and farm type (groundnut vs. rice growers) moderate the relationship between entrepreneurial mindset and entrepreneurial intention. Gender plays a significant role in moderating relationships, influencing variable interactions, and highlighting differences in behavior and attitudes. Research indicates that gender influences entrepreneurial intentions and associated predictors, such as attitudes and subjective norms (Pauline and Padmavathi, 2019). Research indicates that males demonstrate a more robust connection between entrepreneurial commitment and actions than females (Vamvaka et al., 2020). Gender moderates the effects of self-referent beliefs in social entrepreneurship (Bagheri and Lope Pihie, 2014). Broader socio-economic factors may, at times, surpass gender-specific influences (Roy and Das, 2020). Gender influences how individuals respond to external factors and develop entrepreneurial behavior, while farm type affects farmers' willingness to engage in value-added activities. These moderators shape the strength of the entrepreneurial mindset's impact on intention, highlighting differences in entrepreneurial engagement.

Combining these theories, this framework in Figure 1 provides a comprehensive understanding of how farmers' entrepreneurial intentions are shaped, highlighting the importance of fostering an enabling environment that enhances their entrepreneurial mindset. Based on this theoretical framework, the following hypotheses are developed:

H_I: *Economic motivation significantly influences the entrepreneurial mindset dimensions, specifically autonomy, need for achievement, and proactiveness, and indirectly influences entrepreneurial intention.*

H_{II}: *Farmers with higher achievement motivation experience significant improvement in the entrepreneurial mindset dimensions, specifically proactiveness and innovativeness, and indirectly influence entrepreneurial intention.*

H_{III}: *Farmers' information-seeking behavior significantly influences the entrepreneurial mindset dimensions, specifically innovativeness and risk-taking propensity, and indirectly influences entrepreneurial intention.*

H_{IV}: *Farmers' risk orientation significantly influences the entrepreneurial mindset dimensions, specifically their risk-taking behavior, and indirectly influences entrepreneurial intention.*

H_V: *The autonomy of farmers significantly influences their entrepreneurial intention.*

H_{VI}: *The need for achievement among farmers significantly influences their entrepreneurial intention.*

H_{VII}: *The proactiveness of farmers significantly influences their entrepreneurial intention.*

H_{VIII}: *The innovativeness of farmers significantly influences their entrepreneurial intention.*

H_{IX}: *The risk-taking propensity of farmers significantly influences their entrepreneurial intention.*

2 Methodology

2.1 Study area

The study was conducted in Tamil Nadu, India, focusing on Tiruvannamalai, Vellore, Ranipet, and Tirupattur districts, key rice and groundnut cultivation regions. Tiruvannamalai was selected as it ranks first in groundnut cultivation area and third in paddy cultivation in the state. The neighboring districts, Vellore, Ranipet, and Tirupattur, were included due to their geographical proximity, ensuring a continuous study area for comparative analysis. Until 2019, these three districts were part of Vellore, sharing similar agro-climatic and socio-economic conditions. Additionally, a lack of prior studies covering these districts highlights a research gap. This study addresses this gap, offering valuable insights into regional agricultural trends and supporting policy development.

2.2 Data collection

Data was collected through in-person interviews with farmers, ensuring detailed and accurate responses. A purposive sampling method selected two blocks per district based on the highest average rice and groundnut cultivated area. This method allowed for a focused study on areas where groundnut and rice farming are most prominent. The study used Slovin's formula since the variability of populations was not known (like standard deviation). It plays an important role in determining the appropriate sample size, especially when working with large populations and when there is lack of secondary data existing on the population of the study. This approach is particularly beneficial in survey-based research, as it ensures a sample size that strikes a balance by avoiding overly small samples. Finally, this method allows researchers to draw reliable conclusions while utilizing resources efficiently (Singh and Masuku, 2014). The sample size was determined using Slovin's formula with 5% precision, ensuring statistical accuracy and representativeness. Based on this, farmers were selected using a simple random sampling technique to eliminate selection bias. The semi-structured interview schedule was pilot tested in a non-sampling study area with 30 respondents. Data was then collected through semi-structured in-person interviews with 81 groundnut and 120 rice farmers from the four districts. This approach provided diverse insights into farming practices and value-added activities, reflecting the real agricultural landscape of the region.

Data collection focused on comprehensively understanding the farmers' entrepreneurial traits. Key entrepreneurial characteristics were measured using 5 Likert scales, and entrepreneurial mindset was assessed through the multidimensional scale developed by Jung and Lee (2019). Entrepreneurial intention was measured using the scale developed by Liñán and Chen (2009). Additionally, factors were assessed through the literature, such as the economic motivation (Meena and Fulzele, 2008), achievement motivation

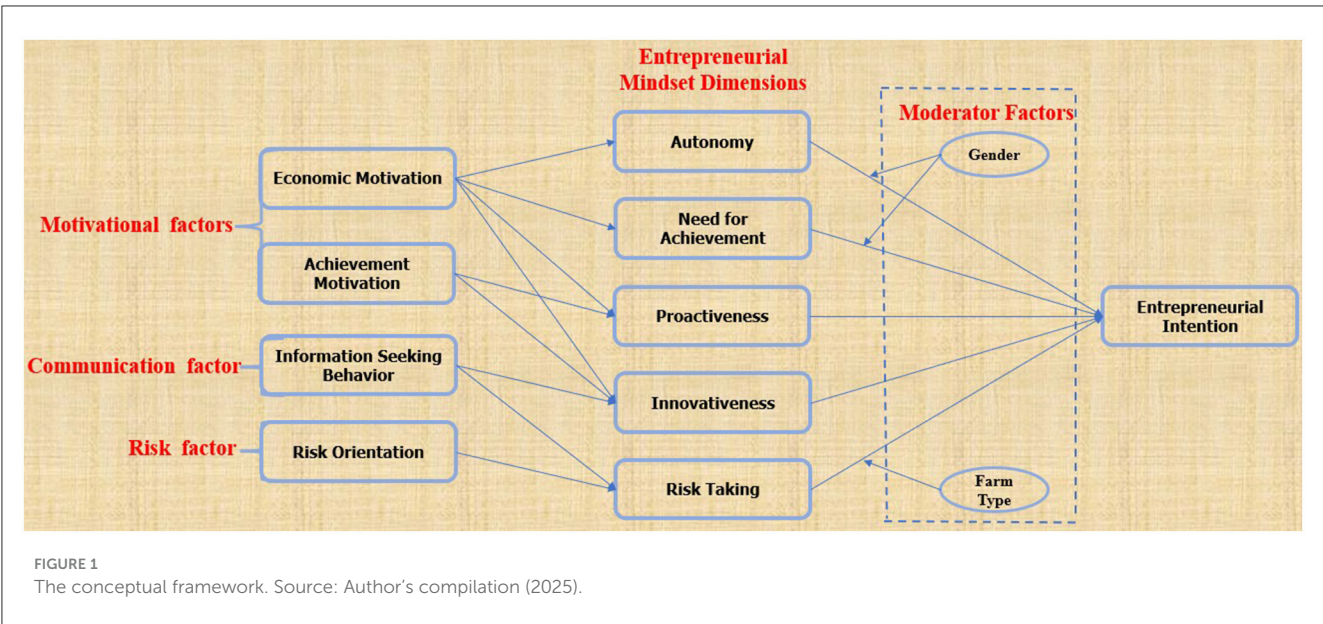


TABLE 1 The construct reliability and validity.

Constructs	Loading	Cronb. α	rho_c	AVE	VIF
Achievement motivation	0.73–0.88	0.741	0.851	0.657	1.33–1.65
Autonomy	0.87–0.88	0.713	0.874	0.777	1.42–1.43
Economic motivation	0.74–0.87	0.715	0.840	0.638	1.32–1.71
Entrepreneurial intention	0.83–0.87	0.871	0.912	0.721	2.01–2.26
Information seeking behavior	0.82–0.87	0.716	0.838	0.721	1.24–1.25
Innovativeness	0.76–0.85	0.742	0.853	0.660	1.00–1.58
Need for achievement	0.87–0.89	0.721	0.878	0.782	1.46–1.47
Proactiveness	0.74–0.82	0.714	0.840	0.637	1.30–1.50
Risk orientation	0.79–0.81	0.722	0.843	0.642	1.41–1.42
Risk taking	0.75–0.87	0.705	0.798	0.666	1.29–1.30

Rh_c = composite reliability.
Source: Survey data (2025).

(Morrison, 1964), information-seeking behavior (Rahman et al., 2020), and risk orientation (Priyadarshni et al., 2017).

valuable insights into the factors influencing entrepreneurial intention among farmers.

2.3 Data analysis

The collected data were initially entered into an Excel file for organization and preliminary checks. Subsequently, the dataset was uploaded into SmartPLS 4.1.0.9 for advanced statistical analysis. Confirmatory Factor Analysis (CFA) was conducted using the PLS-SEM algorithm to validate the measurement model, assessing the reliability and validity of constructs (variables) of the theoretical framework to ensure they reflected the theoretical dimensions accurately. Path analysis was then performed through bootstrapping, a resampling method that provides robust estimates of path coefficients and significance levels. This approach enabled a comprehensive evaluation of complex relationships, offering

3 Results

3.1 Confirmatory factor analysis

3.1.1 Outer model

The data presented in Table 1 shows strong construct reliability and validity, indicating that the measurement model is robust. The factor loadings, ranging between 0.73 and 0.89, confirm that the items strongly represent their respective constructs (Adroher and Tennant, 2019). Additionally, the convergent validity is also well-established, as all Average Variance Extracted (AVE) values exceed the recommended threshold of 0.50 (Lena et al., 2020). Furthermore, the internal consistency of the constructs was supported, with most constructs achieving Cronbach's alpha

TABLE 2 The R^2 output.

Constructs	R^2	R^2 adjusted
Autonomy	0.128	0.124
Entrepreneurial intention	0.476	0.449
Innovativeness	0.510	0.502
Need for achievement	0.277	0.274
Proactiveness	0.342	0.335
Risk taking	0.283	0.276

Source: Survey data (2025).

and composite reliability (rho_c) values above 0.70. Finally, the Variance Inflation Factor (VIF) values, ranging from 1.00 to 2.26, indicate that there is no multicollinearity within the constructs, further reinforcing the model's stability (Vakili, 2018).

3.1.2 Inner model

The R^2 values indicate varying levels of explanatory power for the constructs, with Innovativeness ($R^2 = 0.510$) and Entrepreneurial Intention ($R^2 = 0.476$) showing strong predictive ability, while Autonomy ($R^2 = 0.128$) has low explanatory power. Moderate predictions were observed for constructs like Proactiveness and Risk Taking (Table 2).

The discriminant validity results presented in Table 3 for the constructs based on the Fornell-Larcker criterion are good. The square roots of the diagonal values for each construct surpass the suggested Average Variance Extracted (AVE) threshold of 0.5. This indicates that each construct shows a stronger relationship with its items than with items from other constructs. Furthermore, the diagonal values are consistently higher than the intercorrelations between constructs, confirming that each construct is distinct and measures a unique concept. These results validate the discriminant properties of the measurement model, ensuring clear differentiation between constructs (Harmeni, 2022).

The model fit indices are presented in Table 4. The standardized Root Mean Square Residual value for the saturated model (0.078) is below the threshold (0.08), indicating a good model fit (Hooper et al., 2008). The Normed Fit Index value for the saturated model is 0.92, which exceeds the commonly accepted threshold of 0.90, demonstrating a strong comparative fit (Raykov et al., 2013).

3.2 Path analysis

Figure 2 illustrates the influence of all independent variables on the dependent variable, including both direct and indirect effects.

3.2.1 Direct effect

3.2.1.1 Factor influencing farmers' entrepreneurial mindset

As shown in both Figure 2 and Table 5, the structural equation modeling findings underscore the significant influence of entrepreneurial traits on farmers' entrepreneurial mindset dimensions. Economic motivation demonstrates a highly significant influence on autonomy ($\beta = 0.358$, $p < 0.001$), innovativeness ($\beta = 0.334$, $p = 0.001$), and need for achievement ($\beta = 0.527$, $p < 0.001$). This suggests that financial goals and rewards drive farmers toward independence and creativity and foster a strong sense of personal accomplishment. Similarly, achievement motivation significantly affects proactiveness ($\beta = 0.427$, $p < 0.001$) and innovativeness ($\beta = 0.267$, $p < 0.001$), indicating that farmers with high personal drive are more inclined to adopt innovative practices and take proactive initiatives. Moreover, information-seeking behavior significantly influences innovativeness ($\beta = 0.221$, $p = 0.034$), highlighting that farmers actively seeking knowledge are more likely to explore creative solutions. However, it does not significantly affect risk-taking, suggesting that while a knowledge-seeking disposition enhances adaptability and creativity, it may not directly translate into a willingness to engage in risky ventures. On the other hand, risk orientation significantly predicts risk-taking behavior ($\beta = 0.374$, $p = 0.002$), underlining its pivotal role in entrepreneurial decision-making. Collectively, these results emphasize the importance of enhancing factors such as economic and achievement motivations, alongside risk orientation, which significantly influence farmers' entrepreneurial mindset.

3.2.1.2 Farmers' entrepreneurial mindset and entrepreneurial intention

The entrepreneurial mindset dimensions play a crucial role in shaping farmers' entrepreneurial intentions, particularly their willingness to engage in value-added activities such as rice processing and oil extraction. Proactiveness exhibits a significant positive effect on entrepreneurial intention ($\beta = 0.269$, $p = 0.005$), suggesting that farmers actively seeking opportunities and taking initiative are more likely to pursue entrepreneurial ventures. Similarly, the need for achievement strongly influences entrepreneurial intention ($\beta = 0.371$, $p = 0.026$), indicating that farmers driven by personal accomplishment are inclined to engage in entrepreneurial activities.

Risk-taking behavior ($\beta = 0.580$, $p < 0.001$) shows the most substantial influence on entrepreneurial intention, indicating that farmers willing to embrace uncertainty are likelier to engage in entrepreneurial ventures. However, innovativeness ($\beta = -0.086$, $p = 0.364$) does not exhibit a statistically significant effect on entrepreneurial intention, suggesting that creativity, while necessary, may not directly drive farmers' entrepreneurial decisions in this context. These results imply that interventions designed to enhance entrepreneurial intentions should focus on fostering proactiveness, a strong need for achievement, and a calculated approach to risk-taking. The moderation effects reveal interesting dynamics between farm type, risk-taking, and entrepreneurial intention. While farm type alone does not significantly affect entrepreneurial intention ($\beta = 0.075$, $p = 0.486$), its interaction with risk-taking shows a significant moderating influence. Figure 2

TABLE 3 Discriminant validity.

Constructs	AM	A	EM	EI	G	ISB	I	NA	PA	RO	RT	FT
Achievement motivation (AM)	0.81											
Autonomy (A)	0.44	0.88										
Economic motivation (EM)	0.58	0.35	0.79									
Entrepreneurial intention (EI)	0.37	0.47	0.11	0.84								
Gender (G)	0.05	0.08	−0.01	0.07	1							
Information seeking behavior (ISB)	0.66	0.52	0.63	0.26	0.03	0.84						
Innovativeness (I)	0.61	0.43	0.63	0.37	0.03	0.61	0.81					
Need for achievement (NA)	0.65	0.56	0.52	0.39	0.05	0.59	0.59	0.88				
Proactiveness (P)	0.55	0.55	0.47	0.53	0.15	0.54	0.52	0.54	0.79			
Risk orientation (RO)	0.61	0.48	0.61	0.39	0.09	0.61	0.64	0.59	0.63	0.80		
Risk taking (RT)	0.44	0.55	0.38	0.55	0.13	0.44	0.60	0.47	0.58	0.50	0.81	
Farm type (FT)	0.06	0.16	0.05	0.20	0.05	0.09	0.18	0.09	0.20	0.19	0.23	1

Source: Survey data (2025).

TABLE 4 Model fit.

Indicator	Saturated model	Estimated model
SRMR	0.078	0.159
d_uls	2.677	10.976
d_g	0.991	
χ^2	1173.441	
NFI	0.92	

NFI, normed fit index; SRMR, standardized root mean square residual.
Source: Survey data (2025).

shows that the gender moderating effect is not significant, both directly ($\beta = -0.187, p = 0.236$), and indirectly ($\beta = -0.206, p = 0.215$).

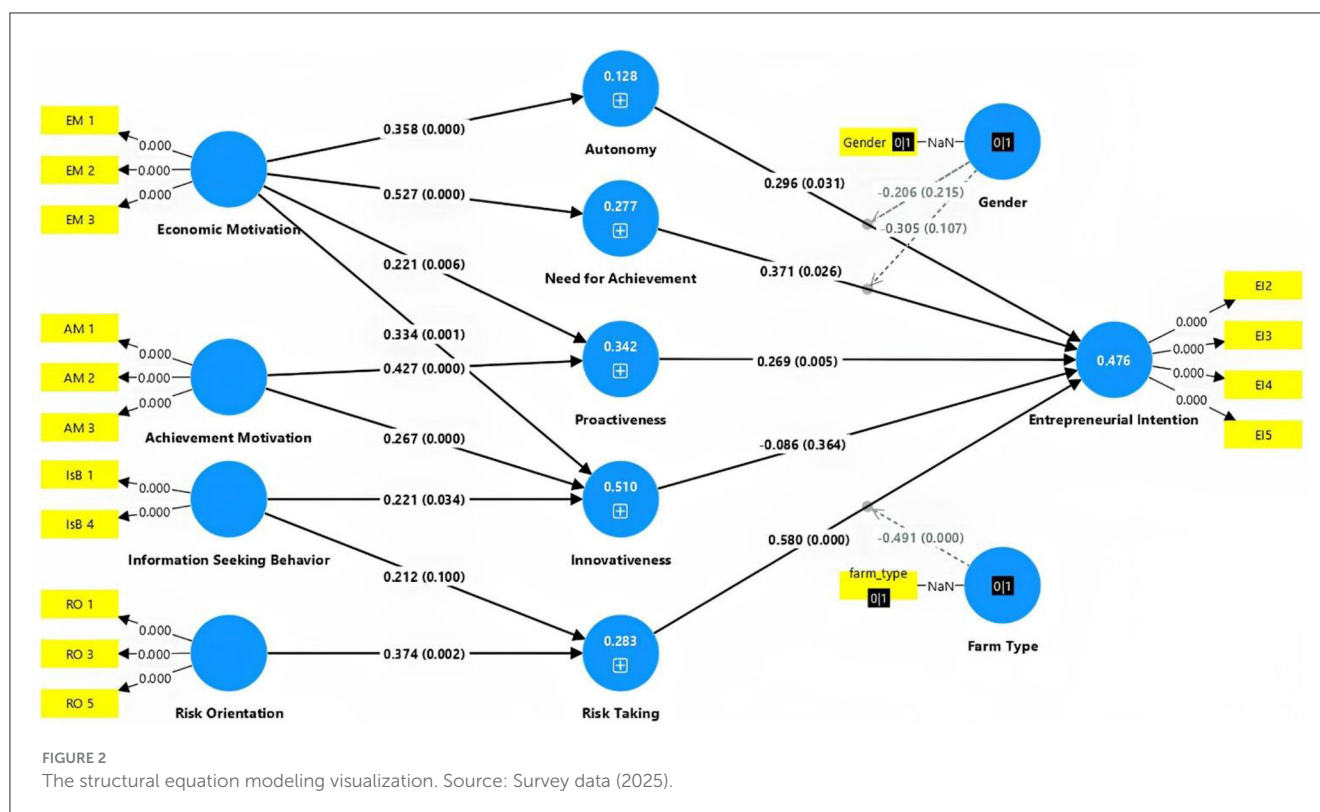
3.2.2 The indirect effect

The structural equation modeling results in Table 6 reveal the indirect effects of farmers’ entrepreneurial traits on entrepreneurial intentions, mediated by entrepreneurial mindset dimensions. Economic motivation significantly influences entrepreneurial intention ($\beta = 0.332, p = 0.001$) through autonomy, innovativeness, and need for achievement, emphasizing the role of economic incentives in fostering entrepreneurial behavior. Similarly, risk orientation indirectly influences entrepreneurial intention ($\beta = 0.217, p = 0.016$) via risk-taking. In contrast, achievement motivation ($\beta = 0.092, p = 0.114$) and information-seeking behavior ($\beta = 0.104, p = 0.158$) lack significant indirect effects on entrepreneurial intention. These results underscore the importance of economic and risk-related factors.

4 Discussion

4.1 Stimulus factors

The path analysis results reveal significant direct effects of stimulus factors on entrepreneurial mindset dimensions, emphasizing the critical role of economic motivation, achievement motivation, information-seeking behavior, and risk orientation. Economic motivation strongly influences autonomy, innovativeness, and the need for achievement, aligning with previous studies highlighting financial incentives as key drivers of entrepreneurial behavior in agricultural contexts (Mubarak et al., 2022). Similarly, achievement motivation significantly affects proactiveness and innovativeness, reinforcing findings that self-driven individuals are more likely to adopt innovative practices and seek entrepreneurial opportunities (Mpetile and Chinyamurindi, 2021). Information-seeking behavior significantly enhances innovativeness but does not directly impact risk-taking, suggesting that knowledge acquisition fosters creativity but may not necessarily increase willingness to engage in risky ventures (Bell, 2007; Quinn and Burbach, 2010). Risk orientation emerges as a critical factor in entrepreneurial decision-making, as it significantly influences risk-taking behavior, supporting the notion that farmers who embrace calculated risks are more likely to pursue entrepreneurial activities (Roos and Botha, 2022). This finding confirms that motivation, communication, and risk factors are stimuli in the S-O-R model as they significantly influence the entrepreneurial mindset. It suggests that enhancing farmers’ motivation, facilitating access to information, and fostering a risk-oriented approach fortifies their entrepreneurial mindset. Targeting these factors enables entrepreneurial development programs to foster innovation and proactive behavior among



farmers, equipping them to identify opportunities, enhance productivity, and establish successful agribusinesses.

4.2 Entrepreneurial mindset dimensions

Furthermore, entrepreneurial mindset dimensions such as proactiveness, need for achievement, and risk-taking play a crucial role in shaping entrepreneurial intentions, particularly in value-added activities like rice processing and oil extraction. Respectively, in the literature, this finding confirms (Mubarak et al., 2022), who identified proactiveness as a strong predictor of entrepreneurial success, highlighting that proactive farmers are better positioned to exploit value-added opportunities. According to Cao and Ngo (2019), a high need for achievement motivates individuals to start businesses and pursue productivity-enhancing activities. Finally, Roos and Botha (2022) also emphasized that risk-taking is a defining characteristic of successful entrepreneurs, particularly in agricultural contexts. The findings suggest that encouraging proactiveness, a strong desire for achievement, and a willingness to take risks can significantly boost farmers' entrepreneurial intentions. This is because an entrepreneurial mindset is an internal (O) state that influences behavior, ultimately leading to entrepreneurial intention (R) in the S-O-R theory. These results imply that interventions designed to enhance entrepreneurial intentions should focus on fostering proactiveness, a strong need for achievement, and a calculated approach to risk-taking while recognizing the context-specific factors that shape farmers' decision-making processes (Cao and Ngo, 2019; Mubarak et al.,

2022; Orabi et al., 2022; Roos and Botha, 2022). Implementing training programs and resources that empower farmers to set goals, take initiative, and navigate uncertainties can significantly enhance their entrepreneurial capacities and outcomes (Yang et al., 2023). Innovativeness, despite its significance, may remain unutilized without adequate resources, support, or market access, in contrast to other dimensions of mindset. Farmers may have innovative ideas but frequently lack the confidence or resources to execute them, underscoring the necessity for enabling conditions to convert creativity into entrepreneurial activity. The literature highlights challenges including limited funding, inadequate institutional support, and restricted market access, which collectively impede farmers' capacity to innovate and commercialize their ideas (Aloukoutou and Moussa, 2023; Marks-Bielska and Biłtyj, 2023). Enhancing proactiveness, achievement motivation, and risk-taking encourages farmers to initiate value-added enterprises such as rice processing and oil extraction. These characteristics promote initiative, goal formulation, and the assurance to proceed in the face of uncertainty. Training and support programs transition farmers from a conventional production approach to opportunity-driven entrepreneurship. This shift in mindset facilitates improved decision-making and sustainable business growth. Ultimately, it fosters a more resilient and innovative agricultural sector.

The indirect effects further underscore the mediating role of the entrepreneurial mindset in linking stimulus factors such as motivation, communication, and risk factors to farmers' entrepreneurial intention. Economic motivation significantly enhances entrepreneurial intention through autonomy, innovativeness, and need for achievement, reinforcing previous research that highlights economic incentives as essential enablers

TABLE 5 The direct effect.

Hypothesis	Coef.	SD	T-value	p-values	Status
Achievement motivation → innovativeness	0.267	0.072	3.702	0.000	Accepted
Achievement motivation → proactiveness	0.427	0.085	5.045	0.000	Accepted
Autonomy → entrepreneurial intention	0.296	0.137	2.164	0.031	Accepted
Economic motivation → autonomy	0.358	0.078	4.571	0.000	Accepted
Economic motivation → innovativeness	0.334	0.104	3.215	0.001	Accepted
Economic motivation → need for achievement	0.527	0.061	8.608	0.000	Accepted
Economic motivation → proactiveness	0.221	0.081	2.723	0.006	Accepted
Gender → entrepreneurial intention	−0.187	0.158	1.184	0.236	Rejected
Information seeking behavior → innovativeness	0.221	0.104	2.120	0.034	Accepted
Information seeking behavior → risk taking	0.212	0.129	1.645	0.100	Rejected
Innovativeness → entrepreneurial intention	−0.086	0.095	0.907	0.364	Rejected
Need for achievement → entrepreneurial intention	0.371	0.166	2.234	0.026	Accepted
Proactiveness → entrepreneurial intention	0.269	0.096	2.807	0.005	Accepted
Risk orientation → risk taking	0.374	0.122	3.062	0.002	Accepted
Risk taking → entrepreneurial intention	0.580	0.118	4.919	0.000	Accepted
Farm_type → entrepreneurial intention	0.075	0.108	0.697	0.486	Rejected
Farm_type × risk taking → entrepreneurial intention	−0.491	0.126	3.889	0.000	Accepted
Gender × autonomy → entrepreneurial intention	−0.206	0.166	1.241	0.215	Rejected
Gender × need for achievement → entrepreneurial intention	−0.305	0.189	1.610	0.107	Rejected

Source: Survey data (2025).

TABLE 6 The indirect effect in the structural equation modeling analysis.

Hypothesis	Coef.	SD	T-value	p-Values	Status
Achievement motivation → entrepreneurial intention	0.092	0.058	1.581	0.114	Rejected
Economic motivation → entrepreneurial intention	0.332	0.101	3.289	0.001	Accepted
Information seeking behavior → entrepreneurial intention	0.104	0.074	1.411	0.158	Rejected
Risk Orientation → entrepreneurial intention	0.217	0.090	2.401	0.016	Accepted

Source: Survey data (2025).

of entrepreneurial action (Mubarak et al., 2022). Likewise, risk orientation indirectly influences entrepreneurial intention through risk-taking, emphasizing the importance of fostering a risk-tolerant attitude in entrepreneurship (Roos and Botha, 2022). However, the absence of significant indirect effects for achievement motivation and information-seeking behavior suggests that these traits alone may not be sufficient to drive entrepreneurial intentions, consistent with findings suggesting these traits enhance mindsets but not entrepreneurial intentions indirectly (Baluku et al., 2020). Developing economic motivation and risk orientation effectively stimulates entrepreneurial action among farmers. These insights focus on interventions to transform the mindset into a viable business approach.

4.3 Moderation effects

The findings reveal that not all groundnut farmers exhibit entrepreneurial intentions. Farmers willing to take risks by engaging in value-added activities and selling their products at a later stage tend to exhibit entrepreneurial intentions. In contrast, those who avoid value addition and sell their produce immediately after harvest lack such entrepreneurial intention. This aligns with existing research emphasizing the significant influence of risk propensity on entrepreneurial behavior among farmers (Shafi et al., 2023). Similarly, Ezeibe et al. (2017) noted that farmers who sell their products immediately post-harvest often lack motivation for innovation and value addition. These

findings underscore the crucial role of risk-taking behavior in shaping entrepreneurial intentions, particularly within the context of value-added agriculture. However, the gender moderating effect showed no significant impact on farmers' entrepreneurial intention, likely due to the limited representation of women in this study. This aligns with Kong and Choo (2022), who observed that adequate female representation amplifies gender differences in entrepreneurial intention.

4.4 Policies implications

The findings have significant implications for policy and practice. Supporting farmers' economic objectives through subsidies or incentives can foster an entrepreneurial mindset, indirectly promoting entrepreneurial intentions, as evidenced by the research of Anubhav et al. (2023) and Huang and Fu (2023). Furthermore, training programs encouraging farmers to adopt risk-taking behaviors can enhance their entrepreneurial potential, aligning with the findings of Ensor and de Bruin (2022). However, for factors such as achievement motivation and information-seeking behavior to have a tangible impact, interventions should directly connect these traits to entrepreneurial opportunities. This could include providing mentorship programs or access to entrepreneurial networks, as confirmed by the findings of Baluku et al. (2020) and Mahindaratne and Min (2019).

5 Conclusion

This study provides a comprehensive understanding of the factors influencing farmers' entrepreneurial intentions, emphasizing the critical role of entrepreneurial traits (motivational, communication, and risk factors) and entrepreneurial mindset dimensions through structural equation modeling. Economic motivation, achievement motivation, and risk orientation emerge as significant drivers of entrepreneurial intention, while proactiveness and risk-taking behaviors strongly predict farmers' willingness to engage in value-added activities. The findings highlight the importance of adopting an intervention that aligns psychological traits with entrepreneurial opportunities, ensuring context-specific support for farmers to enhance their entrepreneurial potential.

Theoretically, this study investigates the influence of farmers' entrepreneurial mindset on entrepreneurial intentions, then integrates motivational, communication, and risk factors that influence entrepreneurial mindset. These findings contribute to novel insights into the agricultural entrepreneurship literature. It reinforces existing research linking economic motivation and risk orientation to entrepreneurial behavior while addressing the underexplored connection between entrepreneurial traits and the entrepreneurial intentions of farmers. The results underscore the need for targeted policies, including subsidies and training programs, that foster key entrepreneurial traits, enabling farmers to innovate and navigate uncertainties effectively.

Based on the study findings, this research provides valuable insights for improving farmers' entrepreneurial intentions. The policymakers and agricultural stakeholders can integrate:

- Financial incentives like subsidies, grants, or microloans to improve farmers' economic motivation.
- Entrepreneurship training focuses on risk assessment, opportunity identification, and decision-making.
- Strengthening of cooperatives/FPOs and promotion of digital platforms to improve market access.
- Strengthening of extension services to provide market price information and a platform to market their products.
- More training programs on value addition.
- Providing a conducive environment for entrepreneurship promotion.

Future studies should explore the particularities of farmers engaging in value-added activities, such as rice processing, oil extraction, manufacturing, or packaging rice and groundnut products, with the family participation effect and family entrepreneurship history, combining qualitative and quantitative methods. This approach will elucidate how entrepreneurial intentions transition into actions within diverse agricultural contexts. Additionally, longitudinal studies can investigate the dynamic interplay of entrepreneurial traits and entrepreneurial behaviors, deepening the understanding of how these factors drive sustainable agricultural entrepreneurship.

Data availability statement

The data analyzed in this study is subject to the following licenses/restrictions. The data is available only upon request. Requests to access these datasets should be directed to ihouatsu.frankayra2022@vitstudent.ac.in / paul.mansingh@vit.ac.in.

Ethics statement

The studies involving humans were approved by Dr. S. Sivakumar (Chairperson); Dr. Pragasam Viswanathan (Member Secretary); Dr. Rajesh N. G. (Member "Medical"); Dr. C. P. Girish Kumar (Member "Non-medical"); Dr. Kalaiselvi (Member "Non-medical"); Dr. N. Aravind Yuvaraj (member "Medical"); Dr. Prasanna Samuel (Member "Biostatistics expert"); Dr. Nagaraju Gundemeda (Member "Sociology expert"); Mr. Venkatesan Kuppusamy (Member "Layprerson"); Mr. M. R. Ravishankar (Member "Legal expert"); and Dr. S. Sreeja (Member "Non-medical") Institutional Ethical Committee for Human studies, VIT School of Bio Sciences and Technology, Vellore Institute of technology. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

AI: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Visualization, Writing – original draft, Writing – review & editing. JM: Conceptualization, Resources, Supervision, Validation, Visualization, Writing – review & editing.

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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.

Generative AI statement

The author(s) declare that no Gen AI was used in the creation of this manuscript.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fsufs.2025.1584522/full#supplementary-material>

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