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Factors determining dairy entrepreneurial readiness among rural youth in Karnataka state: An empirical analysis

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ABSTRACT

The growing recognition of dairy entrepreneurship as a viable livelihood strategy for rural youth has prompted critical inquiry into the determinants that shape their readiness to undertake entrepreneurial ventures in the dairying sector. This study investigated the multidimensional factors influencing entrepreneurial readiness among rural youth to be engaged in or aspiring toward dairy entrepreneurship in Karnataka. The research is grounded on sustainable livelihood framework and human capital theory, focusing on four core domains: individual characteristics, institutional and policy support, entrepreneurial traits, and socio-economic factors. A multistage random sampling method was employed to select 270 rural youth respondents from prominent dairying districts. Primary data were collected using a structured interview schedule and analyzed using Exploratory Factor Analysis (EFA) and multiple linear regression to identify the underlying constructs and their predictive influence on entrepreneurial readiness. EFA revealed a robust four-factor model explaining 52.37% of the total variance, encompassing 17 retained variables. Subsequent regression analysis indicated that all the four extracted factors significantly influenced the entrepreneurial readiness, with individual characteristics ($\beta = 0.412$) and institutional/policy support ($\beta = 0.388$) emerging as the most influential predictors, followed by entrepreneurial traits ($\beta = 0.292$) and socio-economic factors ($\beta = 0.259$). These findings underscored the need for a comprehensive approach for entrepreneurship development that integrates personal capacity building with institutional enablement.

Keywords: Dairying, Entrepreneurial readiness, Factor extraction, Rural youth

The dairy industry in India is a cornerstone of the nation's agrarian economy, significantly contributing to rural livelihoods and nutritional security. India has maintained its position as the world's largest milk producer since 1998, contributing approximately 25% to global milk production (Upadhyay 2024). This achievement is largely attributed to the efforts of over 80 million rural households engaged in dairy farming (Pai 2025). Despite its vast potential, the dairy sector faces several challenges, including limited access to modern technology, fragmented markets, and insufficient entrepreneurial engagement. Smallholder farmers, who contribute over 70% of the milk production, often struggle with access to finance, delayed payments, and the high cost of modern equipment (Dairy Dimension 2025). Additionally, the lack of proper refrigeration and storage facilities affects the quality and safety of dairy products, limiting market growth (Awasthi 2024).

The COVID-19 pandemic further exposed vulnerabilities in rural employment, emphasizing the need for sustainable and inclusive avenues for rural youth (Alam *et al.* 2022). Dairy entrepreneurship offers a unique opportunity to bridge this gap, leveraging the sector's established infrastructure while fostering innovation and self-reliance (Dairy Dimension 2025). In recent years, there has been a growing focus on youth participation in dairy entrepreneurship as a viable solution to unemployment and underemployment in rural areas. Promoting and incentivizing youth participation in the agricultural sector can provide much-needed employment opportunities for rural youth and help fortify food security at the household level (Tripathi and Singh 2017). Opportunities such as value-added dairy products, organic milk production, and dairy tourism are examples of entrepreneurial niches with significant growth potential. India's dairy industry is undergoing a transformation, with value-added dairy products gaining significant traction among consumers (Kabilai Farm 2025). Government initiatives, financial incentives, and institutional support further enhance the ecosystem, empowering youth to explore sustainable business models in the dairy value chain. Several state and central government dairy entrepreneurship schemes provide financial assistance and support to aspiring dairy entrepreneurs, empowering them to establish and expand

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their ventures in the dairy sector (Bajaj Finserv 2023).

Dairy entrepreneurship among rural youth is not merely a response to unemployment but a strategic avenue for fostering economic development and social empowerment. By engaging in production, processing, and marketing, rural youth can create resilient livelihoods while contributing to the broader goals of rural development. This approach aligns with the need for inclusive growth, addressing both the economic and social dimensions of rural employment challenges. Developing entrepreneurship in the dairy sector can thus serve as a transformative strategy, ensuring sustainable livelihoods for rural youth while strengthening the dairy industry's contributions to the national economy (Sumir 2021). In this context, the present study aimed to identify and extract the underlying factors influencing the development of dairy entrepreneurial readiness among rural youth using Exploratory Factor Analysis (EFA). Furthermore, the significance of these factors in predicting dairy entrepreneurial readiness was examined through the application of Multiple Linear Regression (MLR) analysis.

MATERIALS AND METHODS

The study was conducted across nine districts in Karnataka, representing all four physiographic regions. Districts were selected using proportionate random sampling, giving preference to those with a higher frequency of dairy training programs conducted by Krishi Vigyan Kendras (KVKs). From each district, 30 rural youths were randomly selected, resulting in a total sample of 270 respondents. Participants, aged 15 to 34 years, were permanent residents, actively involved in farming, possessed at least secondary education, and had completed formal dairy training, indicating their intent to pursue dairying as a livelihood. Data were collected through face-to-face interviews conducted between August 2023 and March 2024 using a pre-tested, semi-structured schedule in Kannada or English based on respondent preference.

An extensive literature review informed the selection of 18 variables pertinent to entrepreneurial readiness. These included: Entrepreneurial Role Models, Institutional Support, Entrepreneurship Education, Entrepreneurial Knowledge, Entrepreneurial Motivation, Exposure to Self-Employment, Availability of Alternate Employment, Government Policies, Self-Confidence, Need for Achievement, Management Orientation, Extension Participation, Social Participation, Cosmopoliteness, Education, Annual Income, and Land Holding. These variables have been recognized in prior studies as significant determinants of entrepreneurial behaviour among rural youth (Rathore *et al.* 2024).

Data analysis: Data analysis was conducted using SPSS version 20. The analytical process comprised Exploratory Factor Analysis (EFA) followed by Multiple Linear Regression (MLR) to identify and assess the factors influencing dairy entrepreneurial readiness.

Exploratory Factor Analysis (EFA): EFA was employed to uncover the underlying structure of the selected variables. The steps involved in EFA included:

Collinearity assessment: A correlation analysis was performed to identify multicollinearity among variables. Variables exhibiting a high correlation coefficient ($r > 0.8$) were scrutinized, and one of the correlated variables was retained to mitigate multicollinearity issues.

Extraction of items and weighted averages: Out of the 18 variables, 14 were identified as observed variables with significant factor loadings (≥ 0.50). Weighted averages for these variables were computed using the formula:

$$\text{Weighted average} = (S_1LV_1 + S_2LV_2 + ... + S_n*LV_n)/\Sigma LV$$

Where, S represents the response score for each item, and LV denotes the corresponding loading value.

Normalization of Data: To ensure comparability across variables measured on different scales, normalization was performed. For variables with a positive functional relationship:

$$\text{Normalization of data} = \frac{\text{Actual value-Minimum value}}{\text{Maximum value-Minimum value}}$$

For variables with a negative functional relationship:

$$\text{Normalization of data} = \frac{\text{Minimum value-Actual value}}{\text{Maximum value-Minimum value}}$$

Assignment of Weights: Weights for each variable were derived using Principal Component Analysis (PCA). The weight for the i^{th} variable (W_i) was calculated as:

$$W_i = \sum |L_{ie}| E_j$$

Where, L_{ij} is the loading value of the i^{th} variable on the j^{th} factor, and E_j is the eigenvalue of the j^{th} factor.

Composite Index Calculation: The computed weights were utilized to calculate a composite index value for each variable using the formula:

$$Index\ value = \frac{\sum_{i=1}^{n} x_i w_i}{\sum_{i=1}^{n} w_i}$$

Where, X_i is the normalized value of the i^{th} variable, and W_i is the weight of the i^{th} variable.

The index values obtained were subsequently used in the regression analysis to examine their relationship with dairy entrepreneurial readiness.

Multiple Linear Regression (MLR): MLR was conducted using SPSS version 20 to assess the influence of factors identified through EFA on dairy entrepreneurial readiness. The dependent and independent variables were clearly defined, and data were checked for missing values and consistency. The regression model, expressed as $Y = \beta_0 + \beta_1X_1 + ... + \beta_nX_n + \varepsilon$, was analyzed using key statistics such as R-squared, p-values, and regression coefficients to interpret the strength and significance of predictors.

RESULTS AND DISCUSSION

Exploratory Factor Analysis (EFA) results: EFA was carried out using PCA with varimax rotation to uncover the latent variables within the dataset. The factor loadings were

evaluated using a threshold of 0.50, ensuring the retention of items with significant contributions. Out of the 86 initial items covering 14 observed variables, 72 items met the loading threshold and were retained for further analysis. Index values were computed for the 18 variables based on the weighted average of the retained items. These index values were subsequently used for factor extraction.

The communalities of all the extracted items were above 0.50, confirming that the variance of each item was adequately explained by the factor solution. The dataset's suitability for factor analysis was supported by the results of Bartlett's Test of Sphericity ($\chi^2(270) = 3234.25$, $p < 0.05$) and the Kaiser-Meyer-Olkin (KMO) measure, which yielded a value of 0.723, indicating good sampling adequacy as per Kaiser (1974).

The initial EFA resulted in a four-factor solution, explaining 53.60 percent of the total variance. However, one variable 'Availability of Alternative Employment' did not meet the inclusion criteria and was subsequently removed. A second EFA was then conducted with the remaining 17 variables. The revised KMO value was 0.704, which reflected a satisfactory level of sampling adequacy (Field 2013). The communality values remained above 0.50, and the four-factor structure accounted for 52.37 percent of the total variance.

Factors were extracted based on the criterion of eigenvalues exceeding 1.5. The rotated component matrix using varimax rotation (Table 1) provided a clear differentiation of item loadings across four principal factors. These factors were subsequently labelled based on the thematic alignment of the significantly loaded variables (Table 1):

Factor I: Individual characteristic factors with an eigenvalue of 2.658 and accounting for 15.63 percent of the variance, included significant loadings on self-confidence (0.685), education (0.628), need for achievement (0.565), management orientation (0.542), and experience in farming/dairying (0.522). These items collectively reflected core personal and experiential traits vital to entrepreneurial readiness.

Factor II: Institutional and policy support factors contributed 13.97 percent of the variance with an eigenvalue of 2.376, and captured the influence of Government Policy (0.782), Role Model (0.702), and Institutional Support (0.644), emphasizing the external enabling environment, which is crucial to entrepreneurship development.

Factor III: Entrepreneurial trait factors *w*ith an eigenvalue of 2.123 and variance explanation of 12.48 percent, included Entrepreneurial Motivation (0.665), Entrepreneurial Education & Training (0.624), Entrepreneurial Knowledge (0.601), and Exposure to Self-Employment (0.552). These reflected competencies and skills inherent to entrepreneurial preparedness.

Factor IV: Socio-economic factors with an eigenvalue of 1.747 and explaining 10.27 percent of the variance, this factor consisted of annual income (0.612), land holding (0.605), extension participation (0.581), social participation (0.576), and cosmopoliteness (0.514), illustrating the structural and relational resources accessible to potential entrepreneurs.

HYPOTHESIS TESTING

H_1: There is a significant impact of 'Individual Characteristic factors' (Factor I) on Entrepreneurial Readiness (ER) in dairying

To test the H_1hypothesis (H1), ER was regressed on

Table 1. Rotated component matrix

Factors	Components	Variable description	Rotated loadings	% of variance	Eigen value
I	Individual Characteristic factors	Self-confidence	0.685	15.635	2.658
		Education	0.628		
		Need for achievement	0.565		
		Management orientation	0.542		
		Experience in Farming/Dairying	0.522		
II	Institutional and Policy Support factors	Government Policy	0.782	13.976	2.376
		Role Model	0.702		
		Institutional Support	0.644		
III	Entrepreneurial Trait factors	Entrepreneurial Motivation	0.665	12.488	2.123
		Entrepreneurial Education & Training	0.624		
		Entrepreneurial Knowledge	0.601		
		Exposure to Self-Employment	0.552		
IV	Socio-economic factors	Annual Income	0.612	10.276	1.747
		Land Holding	0.605		
		Extension Participation	0.581		
		Social Participation	0.576		
		Cosmopoliteness	0.514		

Table 2. Regression analysis results

Hypothesis	Regression Weights	Unstandardized Beta (B)	Standardized Beta (β)	t-value	p-value	Hypotheses Supported	R^2	F
$_H1$	$F_1 \rightarrow ER$	2.114	.412	6.456	.000**	Yes	0.714	97.344
H_2	$F_2 \rightarrow ER$	1.741	.388	5.916	.000**	Yes		
$_H3$	$F_3 \rightarrow ER$	1.362	.292	4.816	.000**	Yes		
H_4	$F_4 \rightarrow ER$	1.112	.259	4.145	.000**	Yes		

Note: **$p < 0.01$. F_1 = Individual Characteristics factors, F_2 = Institutional and Policy Support factors, F_3 = Entrepreneurial Traits factors, F_4 = Socioeconomic Factors.

Factor I as the predictor variable. The results (Table 2) indicate that Factor I significantly predicted ER, with an F (4, 266) = 97.344, $p < 0.01$. This finding suggested that 'Individual characteristics factors' played a crucial role in shaping entrepreneurial readiness among individuals. The standardized beta coefficient ($\beta = 0.412$, $p < 0.01$) confirms a strong positive relationship between 'Individual Characteristic factors and ER. Additionally, the unstandardized regression coefficient (B = 2.114) indicates that for every one-unit increase in Factor I, ER increases by 2.114 units. This result underscores the importance of Self-confidence, Education, Need for Achievement, Management Orientation, and Experience in Farming/ Dairying under Factor I in enhancing entrepreneurial readiness. These results resonated with earlier studies that emphasized the centrality of personal attributes in entrepreneurial engagement (Shane and Venkataraman 2000; Krueger *et al.* 2000). Self-confidence supports risk-taking and decision-making, while education and management orientation cultivate critical business skills. Need for achievement propels proactive behaviour, and farming/dairying experience grounds individuals in sector-specific knowledge.

H_2: There is a significant impact of 'Institutional and Policy Support factors' (Factor II) on Entrepreneurial Readiness (ER) in dairying

The results (Table 2) indicate that Factor II significantly predicted ER, with an F (4, 266) = 97.344, $p < 0.001$. This suggested that 'Institutional and Policy Support factors' played a vital role in enhancing entrepreneurial readiness among individuals. The standardized beta coefficient ($\beta = 0.388$, $p < 0.01$) confirmed a positive relationship between 'Institutional and Policy Support factors and ER, meaning that higher levels of institutional support, role models, and government policies contribute to greater entrepreneurial readiness. Furthermore, the unstandardized regression coefficient (B = 1.741) indicates that for every one-unit increase in Factor II, ER increases by 1.741 units. These findings align with prior research emphasizing the role of government policies, institutional support, and role models in shaping entrepreneurial behaviour (Acs *et al*. 2008; Minniti, 2008). Government policies provide a regulatory framework, financial incentives, and infrastructure necessary for business development, while institutional support facilitates access to training, funding, and mentorship opportunities. Additionally, role models serve as key influencers, inspiring individuals to pursue entrepreneurial ventures by providing motivation, knowledge, and practical guidance (Bosma *et al*. 2012).

H_3: There is a significant impact of 'Entrepreneurial Trait factors' (Factor III) on Entrepreneurial Readiness (ER) in dairying

The regression analysis from Table 2 demonstrated that Factor III significantly predicted ER, F (4, 266) = 97.344, $p<0.01$, indicating that Factor III played an important role in enhancing ER. The standardized beta coefficient ($\beta = 0.292$, $p < 0.01$) confirms a positive relationship between 'Entrepreneurial Trait factors and ER, implying that a higher level of entrepreneurial motivation, education and training, knowledge, and exposure to self-employment enhanced entrepreneurial readiness. Furthermore, the unstandardized regression coefficient (B = 1.362) indicated that for every one-unit increase in Factor III, ER increases by 1.362 units. These findings aligned with the previous research highlighting the significance of entrepreneurial motivation, education, knowledge, and experience in fostering entrepreneurial activity (Nabi *et al.* 2017). Entrepreneurial motivation serves as a key driver for individuals to pursue and sustain business ventures, while entrepreneurial education and training provide essential skills, competencies, and risk-taking abilities needed for success. Additionally, entrepreneurial knowledge strengthens decision-making capabilities, and exposure to self-employment offers practical experience, reducing uncertainty and enhancing confidence in entrepreneurial activities (Liñán *et al.* 2011).

H_4: There is a significant impact of 'Socio-economic factors' (Factor IV) on Entrepreneurial Readiness (ER) in dairying

The regression analysis demonstrated that Factor IV significantly predicted ER, as presented in Table 2, F (4, 266) = 97.344, $p<0.01$, indicating that Factor IV plays an important role in enhancing ER. The standardized Beta coefficient ($\beta=0.259$, $p<0.01$) showed a positive relationship between Factor IV and ER, suggesting that increased 'Socio-economic factors' was associated with greater readiness for entrepreneurial activities. The unstandardized coefficient (B= 1.112) suggested that for every one-unit increase in Factor IV, ER increased by 1.112 units. These findings highlighted the significant and positive influence of 'Socioeconomic factors' on fostering entrepreneurial readiness. These findings aligned

with the previous research emphasizing the role of socio-economic conditions in entrepreneurial engagement (Van der Sluis *et al.* 2008). Annual income and landholding provide financial security and investment capacity, which are critical for launching and sustaining entrepreneurial ventures. Additionally, extension participation facilitates access to new technologies, knowledge, and skills, while social participation enhances networking opportunities, fostering collaboration and resource mobilization. Moreover, cosmopoliteness, or an individual's openness to external influences and new ideas, plays a vital role in entrepreneurial innovation and adaptability (McElwee and Bosworth 2010).

The study reinforced the idea that entrepreneurial readiness is not merely a function of individual ambition but a multidimensional construct shaped by interlinked personal, institutional, and contextual factors. The strong predictive role of individual characteristics and policy support indicated that fostering entrepreneurial aspirations requires a dual emphasis on internal empowerment and external facilitation. Skills such as self-confidence, experience, and need for achievement must be nurtured alongside effective institutional frameworks and enabling policy environments. Moreover, entrepreneurial traits and socio-economic conditions, though relatively moderate in influence, provide the foundation upon which readiness is built and actualized. Entrepreneurial education, access to role models, and participation in extension and social activities further refine youth capabilities and expand their entrepreneurial horizon. Thus, future policy and intervention strategies must adopt a systemic and inclusive lens targeting not only the capacity-building of individuals but also ensuring cohesive institutional alignment, accessible resources, and mentorship ecosystems. By doing so, rural youth can be positioned not just as beneficiaries but also as active architects of a dynamic, self-sustaining dairy entrepreneurial landscape.

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