From Soil to Success: Unpacking the Role of Entrepreneurial Leadership, Motivation, and Skills in Agriculture

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ABSTRACT:

Agricultural entrepreneurship is a promising approach to enhance rural development and sustainable agriculture. Entrepreneurial success in the agricultural sector increasingly depends on a combination of leadership capabilities, intrinsic motivation, and practical skills. While theoretical models often highlight motivation as a key driver of entrepreneurial performance, emerging research suggests that leadership and skills are equally vital in shaping outcomes. This study, titled From Soil to Success, explores how entrepreneurial leadership influences both entrepreneurial motivation and skills among individuals engaged in agriculture-related industries in Punjab, Pakistan. Drawing data from 140 employees and others engaged in and working in the agri-industrial sector, selected through convenience sampling, the research utilized standardized instruments: the Entrepreneurial Leadership Questionnaire, the Entrepreneurship Motivation Questionnaire, and the Entrepreneurship Skills Questionnaire. Using descriptive-correlational analysis, the findings reveal that entrepreneurial leadership significantly enhances both the motivation and skills of employees. These results contribute to the broader understanding of entrepreneurial dynamics in agriculture by validating existing theories and uncovering new interrelationships between leadership, motivation, and skill development—factors crucial for sustainable growth in the agricultural sector of Punjab.

Keywords— *entrepreneurs, entrepreneurial motivation, success elements, entrepreneurial skill, entrepreneurial leadership, leadership behavior*

INTRODUCTION AND LITERATURE REVIEW

Entrepreneurship in agriculture is a continuous process in which individuals create value at various stages of their career paths (Weerawardena et al., 2021). In this scenario, entrepreneurship is more than simply starting a business; it serves as a path to job creation, innovation, and economic empowerment in rural and agricultural economies.

Agricultural entrepreneurship (AE) has become a popular concept in recent years due to its potential to transform the traditional agriculture sector into a more profitable and sustainable enterprise. Agricultural entrepreneurship is the development of innovative and profitable agricultural business ventures that involve the production, processing, marketing, and distribution of agricultural goods and services. The growing demand for high-quality, locally sourced, and sustainable agricultural products has created an enabling environment for the growth of agricultural entrepreneurship.

Agricultural entrepreneurship has the potential to produce significant economic, social, and environmental benefits. The economic benefits include increased productivity, profitability, and income for farmers and rural communities. Farmers' empowerment, gender equality, and poverty reduction through job creation and income diversification are all social impacts. The consequences

for the environment include the long-term preservation of resources and biodiversity conservation by way of the adoption of climate-smart agricultural practices (Khan et al., 2021).

Theories and models that support agricultural entrepreneurship

Theories and models are crucial in supporting AE as they offer a conceptual framework to understand the complex interactions between entrepreneurs, markets, and the environment. The following table presented several key theories and models that highlight AE and focus their relevance to the agriculture sector.

Table 1: Theories and models that support agricultural entrepreneurship

Theory/Model	Description (Key Points)	Reference
Resource-Based Theory	- Emphasizes internal resources as the basis of competitive advantage. - In AE (Agricultural Entrepreneurship), access to land, labor, capital, and knowledge is essential for success. - Suggests leveraging unique agricultural assets and local expertise.	Dyer & Singh, 1998
Social Capital Theory	- Highlights the importance of social networks, trust, and relationships in entrepreneurial success. - Helps agripreneurs access information, share resources, and gain market entry. - Particularly relevant for community-based or rural agricultural ventures.	Agrawal & Saxena, 2019 Agrawal et al., 2022
Institutional Theory	- Stresses the influence of formal institutions (laws, policies) and informal institutions (norms, culture) on entrepreneurship. - Agricultural entrepreneurs are shaped by the policy environment, local traditions, and regulatory systems.	Coppola et al., 2020
Triple Bottom Line Model	- Encourages balancing economic, social, and environmental outcomes. - Agripreneurs are expected to go beyond profit to ensure social inclusion and environmental responsibility. - Promotes sustainable agriculture and ethical business practices.	Elkington, 1999

These theories and models have been applied to the agricultural industry in recent studies.

Using the social capital theory, Agrawal et al. (2022) investigated the factors influencing Indian women entrepreneurs' performance in agribusiness. This strategy emphasizes the importance of connections and social media sites in promoting successful entrepreneurship. Coppola et al. (2020) used institutional theory to show how institutions and societal norms influence technical adoption by examining the impact of cultural factors on precision agriculture technology adoption in Italy. These models and concepts offer useful frameworks for understanding the complexities of AE. They help business owners identify potential opportunities, overcome obstacles, and build inclusive,

sustainable enterprises. Using these theoretical perspectives, agricultural entrepreneurs can more effectively navigate the complex dynamics of their surroundings.

BENEFITS OF AGRICULTURAL ENTREPRENEURSHIP

Agriculture is widely acknowledged to have the potential to significantly increase national income while directly employing and providing income for a sizable and frequently marginalized segment of the population (Khan et al., 2024, Bairwa et al., 2014; Pandey, 2013). Agribusiness is necessary to make the farm industry more appealing and profitable, especially for the younger generation. When the most basic agricultural resources—soil, seeds, and water—are managed in accordance with market demand, as well as a few other viability and success characteristics, the sector has enormous potential to foster entrepreneurship. Students who choose or are unable to pursue university degrees may choose to work in agribusiness (also known as "agripreneurship") if they are taught the necessary agricultural theory and skills. This type of business or job could be just as profitable and successful as other options. Young people who are encouraged to pursue agribusiness have the opportunity to earn money while also contributing to the nation's food supply (Bairwa et al. 2014).

Agricultural entrepreneurship has the potential to benefit both individual business owners and the agricultural industry in general. The main benefits of AE have been discussed in this section, along with current citations and references to back up our claims. This table outlines the various benefits of Agricultural Entrepreneurship (AE) based on recent studies

Table2: **Outlines the Various Benefits of Agricultural Entrepreneurship (AE)**

Theme	Findings	Country	Reference
Innovation	AE drives innovation by developing new products, technologies, and business models, enhancing productivity, efficiency, and sustainability. For example, smallholder farmers in Kenya who joined agribusiness incubators created new products, boosting their incomes.	Kenya	Hornum (2022)
	In India, the adoption of drone technology for agricultural monitoring increased yields and reduced costs, showcasing AE's role in innovation.	India	Sharma et al. (2021)
	In South Africa, AE have introduced innovative irrigation solutions, leading to water conservation and improved crop yields.	South Africa	Moyo et al. (2020)
	In the US, agricultural entrepreneurs have developed new machine technologies that reduce labor costs and improve efficiency in large-scale farming.	United States	Harris et al. (2021)
Job Creation	AE creates job opportunities, especially in rural areas with high unemployment.	Brazil	Kuhn (2018)

	SMEs in agriculture are responsible for a significant portion of the workforce.		
	The rise of agricultural entrepreneurship has increased rural employment, particularly through agro-processing ventures.	Bangladesh	Rahman et al. (2020)
	AE has played a crucial role in creating jobs in rural areas by expanding the horticulture sector.	Mexico	Garcia et al. (2020)
	AE has helped reduce youth unemployment by offering opportunities in agriculture, particularly in organic farming.	Egypt	Al-Masri et al. (2021)
Value Addition	AE adds value to raw agricultural products, turning them into higher-value goods. Women entrepreneurs in the shea butter industry increased their incomes by processing raw materials into finished goods.	Nigeria	Oyekale et al. (2012)
	AE has played a key role in adding value to coconut products, leading to expanded markets and better income for farmers.	Sri Lanka	Perera et al. (2019)
	AE has led to the creation of new value-added products, such as processed palm oil, improving the livelihoods of smallholders.	Indonesia	Sumarto et al. (2018)
	AE in the seafood sector has increased profitability by processing raw seafood into higher-value export products.	Thailand	Tan et al. (2020)
Economic Growth	AE contributes to economic growth by creating businesses, increasing productivity, and stimulating demand. The avocado value chain has led to poverty reduction and growth.	Kenya	Joosten et al. (2015)
	AE in the coffee sector has significantly boosted local economies by increasing exports and job opportunities.	Ethiopia	Bekele et al. (2021)
	AE in the rice sector has led to increased export capacity, driving economic growth.	Vietnam	Nguyen et al. (2019)
	AE has contributed to economic growth by expanding the soy production sector and increasing exports.	Argentina	Silva et al. (2020)
Livelihood Improvement	AE improves smallholder farmers' livelihoods by providing access to new markets.	Philippines	Cavite et al. (2022)

	AE has opened new market opportunities for small-scale coconut farmers.		
	AE's involvement in organic farming has improved farmers' economic conditions by expanding their market reach.	Nepal	Singh et al. (2020)
	AE in the poultry industry has increased smallholder income by creating new market avenues.	Zambia	Chanda et al. (2021)
	AE in the dairy industry has significantly improved the livelihoods of small farmers through value-added milk products.	Bangladesh	Rahman et al. (2019)
Food Security & Nutrition	AE enhances food security and nutrition by promoting the production and consumption of nutritious crops. AE has contributed to improved food security by encouraging the production of diverse crops.	Kenya	van Dijk et al. (2021)
	AE focused on nutrient-dense crops like millet has improved both nutrition and food security for rural populations.	India	Rao et al. (2021)
	AE initiatives in the legume sector have contributed to improved food security by diversifying diets and increasing local production.	Ethiopia	Tesfaye et al. (2020)
	AE in the maize sector has enhanced food security by increasing production and stabilizing prices.	Malawi	Moyo et al. (2021)
Pakistan	AE has boosted agricultural productivity, with entrepreneurs focusing on improving seed quality, processing, and packaging to add value to crops.	Pakistan	Ali et al. (2020)
	AE has contributed to food security in Pakistan by introducing drought-resistant crops and innovative farming techniques.	Pakistan	Shah et al. (2022)
	AE has led to increased export capacity in the cotton and wheat sectors, improving economic outcomes for farmers.	Pakistan	Khan et al. (2021)
	Rural communities have benefitted from AE through the introduction of value-added products such as processed fruits and vegetables.	Pakistan	Iqbal et al. (2020)

The above summary presented in the table reflects that the AE has the potential to provide numerous benefits, both to individual entrepreneurs and the agricultural sector. These benefits can help to alleviate poverty, boost economic growth, and promote long-term development.

TYPES OF ENTREPRENEURIAL OPPORTUNITIES IN AGRICULTURE

Agriculture offers a wide range of entrepreneurial opportunities, from small-scale agribusinesses to large-scale commercial enterprises. Entrepreneurs in the industry can develop new products, services, and business plans by leveraging cutting-edge technology and creative thinking to meet changing customer demands. The table below summarizes the various types of agricultural entrepreneurship opportunities using current citations and references.

Table 3: Types of Entrepreneurial Opportunities in Agriculture

Theme	Findings	Country	Reference
Primary Production	Involves cultivating crops or raising livestock for sale, either for direct consumption or for processing. Small-holder farmers, who are a key group of primary producers, often benefit from programs like farm field schools. Small-holder farmers who participated in such programs improved their crop yields and incomes.	Tanzania	Ismail (2022)
	Small-holder farmers involved in organic farming have increased both their production and income levels by using sustainable farming techniques.	Ethiopia	Tesfaye et al. (2021)
	Small-holder farmers in the dairy sector have improved their production levels and financial outcomes by adopting better animal husbandry practices.	Kenya	Muriuki et al. (2020)
	Small-holder farmers growing high-value crops such as spices have increased their income through the adoption of improved agricultural practices.	India	Singh et al. (2021)
Agro-processing	This involves transforming raw agricultural products into higher-value goods. Agro-processing can create new business opportunities, enhance product shelf-life, and increase market access. For example, cassava processing has created new business opportunities and improved the livelihoods of women entrepreneurs.	Cameroon	Uduji et al. (2022)

	The processing of cocoa into various products has generated new jobs and markets for smallholder farmers and entrepreneurs.	Nigeria	Kwakwa et al. (2022)
	Agro-processing in the shea butter industry has led to the creation of new jobs and increased the value of local agricultural products.	Ghana	Osei et al. (2021)
	The processing of fruits into jams, juices, and dried products has helped increase the income of small-scale farmers while providing new employment opportunities.	South Africa	Moyo et al. (2021)
Marketing and Distribution	Involves selling and distributing agricultural products through traditional or modern channels, improving market access and income for farmers. For example, mobile-based market information services have enabled smallholder farmers to increase sales and income.	Kenya	Biscaye et al. (2015)
	The use of e-commerce platforms for the sale of organic produce has expanded market reach and increased income for farmers.	India	Kumar et al. (2020)
	Digital marketing strategies have helped smallholder farmers access new markets and improve their bargaining power.	Bangladesh	Rahman et al. (2020)
	Cooperative marketing and distribution systems have enabled smallholder farmers to achieve better market prices for their produce.	Brazil	Costa et al. (2021)
Agritourism	Involves providing tourism services in rural areas, such as accommodation, food, and recreation. Agritourism can create job opportunities and promote local culture. Agritourism has led to new business opportunities and contributed to rural development.	Romania	Dragoi et al. (2017)
	Agritourism has become a key component of rural economic diversification, helping to promote local agricultural products while generating employment.	Italy	Della Corte et al. (2021)

	Agritourism has fostered rural development by attracting tourists to experience farm life and purchase local agricultural products.	New Zealand	Edwards et al. (2020)
	Agritourism has created new revenue streams for farmers, enabling them to offer farm stays and local food experiences to tourists.	Australia	Lawrence et al. (2021)
Pakistan	Smallholder farmers involved in agribusiness incubator programs have improved their income and livelihoods.	Pakistan	Mashapure et al. (2023)
	The development of agro-processing enterprises has enhanced income and market access for smallholder farmers.	Pakistan	Khan et al. (2022)
	The marketing of local agricultural products through digital platforms has helped farmers reach new markets and increase their profits.	Pakistan	Shah et al. (2021)
	Agritourism has been identified as a promising avenue for rural economic development, helping to diversify incomes and support local culture.	Pakistan	Ali et al. (2022)

Agricultural entrepreneurship necessitates more than technical expertise. It necessitates a combination of business acumen, creativity, risk-taking, and a range of personal and professional abilities. According to Shahzad et al. (2021), entrepreneurial skills are critical to organizational success, especially in sectors such as agriculture where innovation and adaptability are essential. This emphasizes the importance of developing a strong skill base among individuals involved in agribusiness.

There is a significant positive association between students' business ambitions and their level of entrepreneurial knowledge, suggesting that enhanced understanding fosters greater interest in business-related endeavors. Based on this observation, the current study emphasizes the need for curriculum developers to reinforce core business courses, particularly within agricultural faculties, to cultivate a stronger foundation in entrepreneurship. It is also recommended that these courses be supplemented with engaging, practical activities designed to spark students' interest in pursuing business opportunities related to agriculture. Furthermore, entrepreneurship education should aim to nurture essential entrepreneurial qualities such as innovation, risk-taking, motivation, and perseverance—traits that are vital for future agricultural entrepreneurs to thrive in evolving markets (Khan et al., 2021).

Chan et al. (2012) investigated the relationships between entrepreneurial leadership, motivation, and skills, concluding that these variables are interconnected and collectively influence entrepreneurial performance. In a similar vein, Miao et al. (2018) discovered that employees working in entrepreneurially driven organizations were more motivated and creative, highlighting the importance of entrepreneurial behavior in increasing workforce productivity.

Entrepreneurial leadership is more than just traditional leadership. It entails organizing people around common goals while also demonstrating behaviors like risk-taking, innovation, and opportunity recognition in dynamic settings. According to Perotti et al. (2015), entrepreneurial leaders are distinguished by their proclivity to innovate, take initiative, and seize emerging opportunities—characteristics that are especially important in navigating the rapidly changing agricultural landscape.

These executives play an important role in identifying environmental opportunities, which lead to increased productivity and long-term organizational growth. According to Jardim (2021), a successful agricultural leader is someone who paves the way for progress by introducing new ideas and mobilizing others to achieve common goals.

As agriculture continues to face market fluctuations, climate change, and technological disruption, traditional leadership approaches may become ineffective. Today's agribusiness environment necessitates adaptive leadership frameworks that promote entrepreneurial thinking and proactive responses to uncertainty. Kuratko (2007) goes on to say that when entrepreneurs successfully communicate and promote their ideas, they become true entrepreneurial leaders. This is consistent with the growing need for strategic leadership in agricultural enterprises, particularly in regions such as Punjab, where agriculture remains a major economic driver.

Despite the growing interest in entrepreneurship, there is still a lack of understanding about the practical implications of entrepreneurial leadership, particularly in agriculture. As Sawaean and Ali (2020) point out, current leadership challenges include encouraging participation, managing knowledge, and cultivating creativity—all of which are necessary for entrepreneurial success.

Although several studies have looked into various aspects of entrepreneurship, such as financing, technology adoption, and the role of individual characteristics, the specific relationship between entrepreneurial leadership, motivation, and skills has received relatively little attention. To address this gap, the current study was conducted to look into how entrepreneurial leadership affects motivation and skill development among agricultural professionals in Punjab.

This study may contribute to the field in two ways: first, by identifying new empirical relationships between leadership, motivation, and skills in agriculture; and second, by reaffirming established theoretical findings in a new regional context. The following table presented the summary of the same.

Table 4: Summary of Key Literature on relationship between Entrepreneurial Leadership, Motivation, and Skills

Author(s)	Key Findings	Focus Area	Methodology
Chan et al. (2012)	Leadership and motivation are critical drivers of positive job attitudes in entrepreneurial environments.	Leadership & Motivation	Quantitative, Survey-based

Eliana et al. (2020)	Motivation significantly contributes to entrepreneurial progress by shaping attitudes and outcomes.	Motivation	Quantitative, Longitudinal Study
Olutadeh et al. (2015)	Leadership positively influences employee motivation and satisfaction, promoting organizational effectiveness.	Leadership & Employee Motivation	Qualitative, Interviews
McKelvie et al. (2020)	Motivation and willingness are central to opportunity recognition and resource mobilization, key elements of entrepreneurship.	Motivation & Entrepreneurial Process	Quantitative, Structural Equation Modeling (SEM)
Abatecola et al. (2022)	Motivation acts as a driving force for entrepreneurial behavior and decision-making.	Motivation	Quantitative, Survey-based
Jing (2022); Su et al. (2020)	Motivation explains individuals' decisions to pursue entrepreneurship.	Motivation & Entrepreneurial Choice	Qualitative, Case Study
Kah et al. (2022)	Motivation is described as an internal force that activates and sustains entrepreneurial action.	Psychological Motivation	Quantitative, Experimental Study
Gódány et al. (2021)	Goal achievement and purpose drive entrepreneurial motivation.	Intrinsic Motivation	Mixed-Methods
Forson et al. (2021)	Key motivators include autonomy, financial independence, self-management, and application of knowledge.	Entrepreneurial Motivation Drivers	Qualitative, Interviews
Abecassis-Moedas et al. (2021);	Long-term vision, achievement, and favorable outcomes are	Long-term Motivation	Qualitative, Case Study

Bushi (2021)	important motivational triggers.		
Gaile et al. (2020)	High motivation is associated with increased entrepreneurial behavior and improved organizational performance.	Motivation & Performance	Quantitative, Cross-sectional
Galvão et al. (2020)	Entrepreneurial skills such as decision-making, innovation, and opportunity recognition are essential for agricultural entrepreneurs in dynamic markets.	Skills in Agricultural Entrepreneurship	Qualitative, Case Study

THEORETICAL FRAMEWORK

The AE framework emphasizes the importance of identifying market opportunities, adding value to agricultural products, conducting market research, and acquiring strong financial management skills. It also underlines the value of collaboration and partnerships with stakeholders, such as suppliers, distributors, and customers. One important aspect of the AE framework is its emphasis on sustainable and inclusive development. This means that entrepreneurs must consider their ventures' environmental and social impact, in addition to their economic benefits. Sustainable practices, such as conservation agriculture and organic farming, can help to improve soil health, lower greenhouse gas emissions, and increase biodiversity. Another key component of the AE framework is the use of technology and innovation to boost efficiency and productivity. Precision agriculture technologies, such as drones and sensors, can assist farmers in monitoring and optimizing crop yields, whereas mobile applications can help farmers connect with markets and customers.

This study was based on Entrepreneurial Leadership Theory, which combines elements of leadership, entrepreneurship, and innovation. It implies that entrepreneurial leaders influence organizational outcomes by motivating individuals, encouraging innovation, and facilitating skill development in dynamic settings (Gupta et al., 2004). The framework is also supported by the Self-Determination Theory (Deci & Ryan, 1985), which holds that motivation—particularly intrinsic motivation—plays an important role in shaping behavior and performance. Individuals who perceive autonomy, competence, and relatedness are more likely to be motivated and use their skills effectively. Furthermore, Human Capital Theory emphasizes the value of developing entrepreneurial skills. It implies that education, experience, and skills contribute directly to better performance and economic outcomes (Becker, 1964).

Recent research has demonstrated the advantages of implementing the agricultural entrepreneurship framework. Khan et al. (2021) discovered that entrepreneurship had a positive impact on sustainable agricultural development in Pakistan, whereas Bonadonna et al. (2022)

showed that agritourism has the potential to contribute to sustainable rural development in Tunisia. Overall, the agricultural entrepreneurship framework offers a practical and effective approach to developing innovative and profitable agricultural ventures while promoting long-term and inclusive growth.

Adopting the framework allows agricultural stakeholders to improve their entrepreneurial skills and knowledge while also contributing to the sector's transformation.

CONCEPTUAL FRAMEWORK

The conceptual framework outlines the **causal relationships** among the three primary variables in the context of the agricultural sector:

1. **Entrepreneurial Leadership (Independent Variable)**
   → Traits such as innovation, vision, proactiveness, opportunity recognition, and risk-taking.
   → Drives change, motivates employees, and sets direction for organizational growth.
2. **Entrepreneurial Motivation (Mediating Variable)**
   → Refers to internal and external drivers that encourage individuals to pursue entrepreneurial activities.
   → Includes achievement needs, autonomy, self-fulfillment, financial independence, and social influence.
3. **Entrepreneurial Skills (Dependent Variable)**
   → The practical application of knowledge and competencies necessary to manage agricultural ventures.
   → Includes technical skills, managerial skills, decision-making ability, problem-solving, and personal maturity.

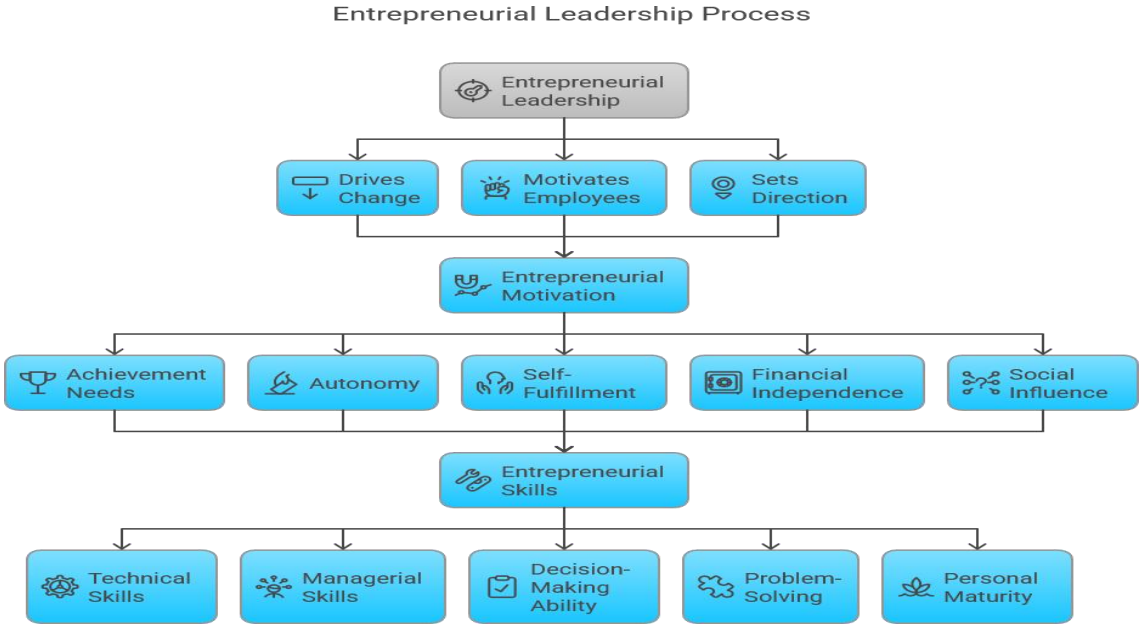


Fig: Conceptual Framework

STATEMENT OF PROBLEM

Agriculture has long served as an economic pillar in developing countries such as Pakistan, where the industry is critical to food security and rural development. Despite its enormous growth potential, the agricultural sector faces a number of challenges, including low productivity, inadequate infrastructure, limited market access, and the growing effects of climate change. Entrepreneurial leadership, drive, and abilities—critical components that propel innovation, sustainability, and economic expansion in the industry—are at the heart of overcoming these challenges.

Smallholder farmers and agribusinesses in areas such as South Punjab, Pakistan, frequently struggle to capitalize on entrepreneurial opportunities due to a lack of essential leadership traits, drive, and abilities required to successfully navigate the challenging agricultural environment. A lack of entrepreneurial leadership has resulted in missed opportunities to introduce new technologies, increase value addition, and penetrate new markets. Furthermore, both intrinsic and extrinsic motivation are required for innovation and the implementation of new agricultural techniques, which are currently underutilized due to a lack of entrepreneurial drive.

This study aimed to address this gap by investigating the role of entrepreneurial leadership, motivation, and skills in the agriculture sector, with a particular emphasis on how these factors Regardless of previous research in a number of sectors, the intersection of entrepreneurial leadership, motivation, and skills in agricultural contexts such as South Punjab remains poorly understood. Despite the growing importance of these factors, little empirical data exists on how they interact to influence smallholder farmer success, transform agricultural outcomes, and advance agricultural development as a whole influence the success and sustainability of agricultural enterprises in South Punjab, Pakistan. The study focused on unpacking the complexities surrounding the adoption of innovative farming practices and technologies, value addition, and market access, as well as how entrepreneurial qualities can boost the region's agricultural resilience and growth.

Objectives

Based on these foundational insights, the present study proposes three main objectives.

1. There is a positive relationship between entrepreneurial leadership and entrepreneurial motivation.
2. There is a positive relationship between entrepreneurial leadership and entrepreneurial skills.
3. There is a relationship between entrepreneurial leadership and the components of entrepreneurship skills, including technical, managerial, entrepreneurial, and personal maturity skills.

METHODOLOGY

Research Design

This study uses a descriptive-correlational research design to examine the relationships between entrepreneurial leadership, motivation, and skills, as well as their collective impact on the success of smallholder farmers and agribusinesses in South Punjab, Pakistan. This design is suitable

for investigating patterns, relationships, and potential cause-and-effect dynamics among the chosen variables.

Population and Sampling

The target population for this study comprises agricultural entrepreneurs, including smallholder farmers, agribusiness managers, and participants in agribusiness incubator programs across selected districts of South Punjab, Pakistan. These individuals were selected due to their active engagement in agricultural innovation, enterprise development, and their contribution to the transformation of the sector.

Based on preliminary assessments, the total population was estimated to be approximately 300 individuals. To determine an appropriate sample size, Krejcie and Morgan's (1970) sample size determination table was employed, resulting in a required sample of 140 respondents to ensure adequate statistical representation.

Instrument	Developer(s)	Dimensions/Structures	Items	Scoring Method	Reliability (Cronbach's Alpha)	Validity and Interpretation
Entrepreneurial Leadership Questionnaire	Davar et al. (2021)	5 Main Structures: Guidance, Support, Coaching, Facilitation, Entrepreneurship 13 Sub-Structures	72	5-point Likert scale	Overall α = 0.913; All dimensions > 0.7	Validity confirmed using Content Validity Ratio (CVR). Davar et al. (2021) also reported α = 0.90. Scores are calculated as the average item scores.
Entrepreneurial Skills Questionnaire	Smith et al. (2008)	Technical, Managerial, Marketing	–	5-point Likert scale	α > 0.70 (Sarmad et al., 2011)	Validity confirmed by Smith et al. (2008). Score range: 16–27 = Low skills 27–54 = Moderate >54 = High skills
Entrepreneurial Motivation Questionnaire	Taormina et al. (2007)	Intrinsic and Extrinsic Motivation	–	5-point Likert scale	α = 0.80 (Rezaei et al., 2012)	Convergent and divergent validity confirmed. Score range: 11–24 = Low motivation

						24–35 = Moderate >35 = High motivation
Entrepreneurial Success	Adapted from multiple sources	Growth, Profitability, Market Access	–	Composite score from questionnaire items	–	

Given the geographical spread and accessibility challenges in rural areas, the study adopted a convenience sampling technique to select participants. Data were ultimately drawn from 140 individuals working in the agri-industrial sector, utilizing standardized research instruments to ensure reliability and consistency in measurement.

Data Collection Instrument

The study utilized standardized and validated instruments to assess the key constructs:

- Entrepreneurial Leadership was measured using the Entrepreneurial Leadership Questionnaire developed by Davar et al. (2021).
- Entrepreneurial Motivation was assessed through the Entrepreneurial Motivation Questionnaire designed by Taormina et al. (2007).
- Entrepreneurial Skills were evaluated using the Entrepreneurship Skills Questionnaire developed by Smith et al. (2008).

These instruments have been widely used in prior research and demonstrate strong validity and reliability for measuring the respective constructs within entrepreneurial and agricultural contexts. Table presents the same as follows.

Table5: Description of Research Instruments

The questionnaire items were adapted from validated scales in the prior research as well as adjusted for relevance to the agricultural setting. A pilot test with 15 participants was conducted to evaluate clarity, consistency, and contextual appropriateness, resulting in minor revisions.

Data Analysis Techniques

Collected data were analyzed using SPSS and AMOS software. The following analytical techniques were employed:

- Descriptive statistics: to summarize respondent demographics and variable distributions.
- Pearson correlation: to assess the strength and direction of relationships between variables.
- Multiple regression analysis: to evaluate the predictive power of entrepreneurial leadership, motivation, and skills on entrepreneurial success.
- Structural Equation Modeling (SEM): to validate the conceptual framework and assess both direct and indirect effects among the variables.

Justification of Methodology

This mixed-method statistical approach enables a more nuanced understanding of the interactions between psychological, behavioral, and skill-based factors in agricultural entrepreneurship. It provides empirical evidence to help shape policy, training programs, and capacity-building initiatives aimed at empowering agricultural entrepreneurs in developing countries like South Punjab.

RESULTS

Table6: Demographic Profile of Respondents (N = 140)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	104	74.3%
	Female	36	25.7%
Age Group	18–30 years	32	22.9%
	31–40 years	58	41.4%
	41–50 years	34	24.3%
	51 years and above	16	11.4%
Education Level	No Formal Education	18	12.9%
	Primary/Secondary	46	32.9%
	Intermediate	28	20.0%
	Bachelor's Degree	34	24.3%
	Master's Degree or Above	14	10.0%
Type of Agricultural Activity	Smallholder Farming	64	45.7%
	Agribusiness Owner/Manager	42	30.0%
	Participant in Agribusiness Incubator	34	24.3%
Years of Experience	Less than 5 years	22	15.7%
	5–10 years	48	34.3%
	11–20 years	40	28.6%
	More than 20 years	30	21.4%
District	Multan	36	25.7%

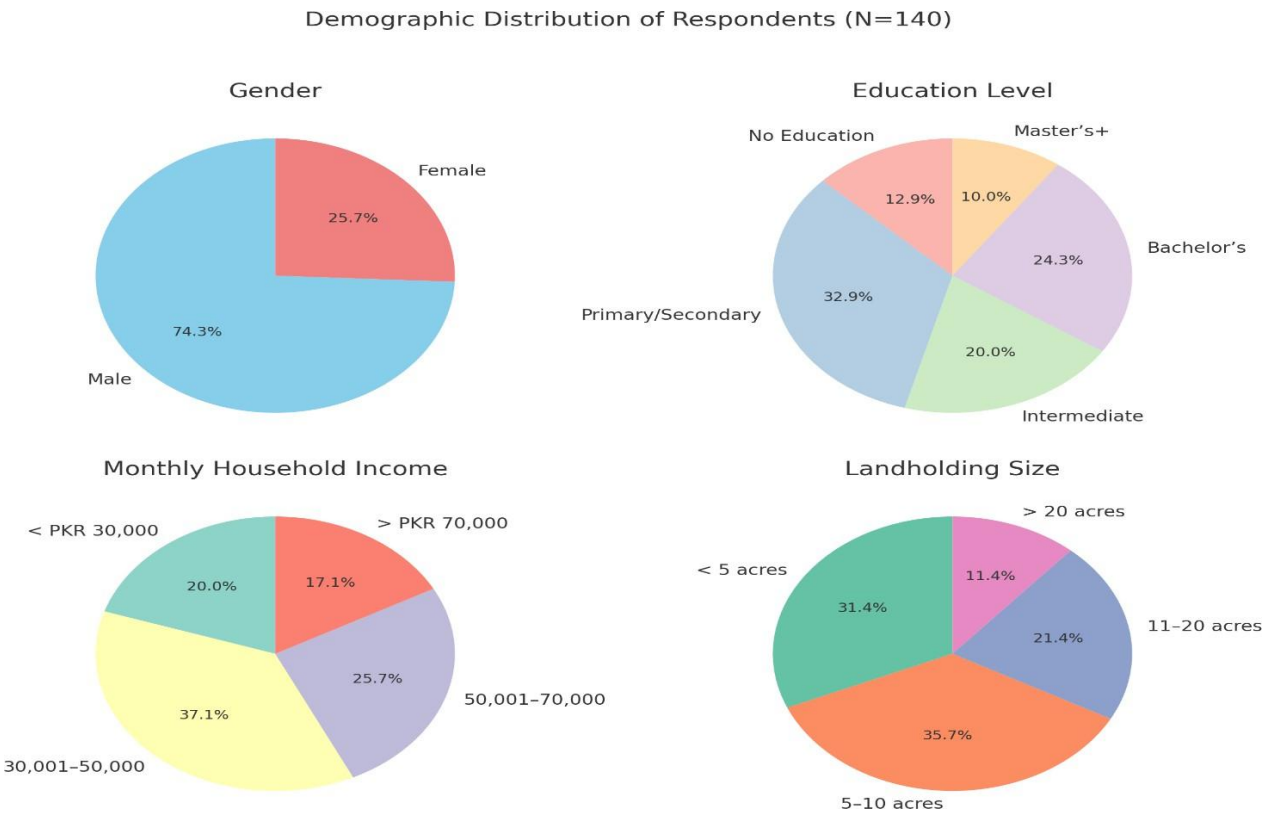
	Bahawalpur	34	24.3%
	Rahim Yar Khan	38	27.1%
	Dera Ghazi Khan	32	22.9%
Monthly Household Income	Below PKR 30,000	28	20.0%
	PKR 30,001–50,000	52	37.1%
	PKR 50,001–70,000	36	25.7%
	Above PKR 70,000	24	17.1%
Landholding Size	Less than 5 acres	44	31.4%
	5–10 acres	50	35.7%
	11–20 acres	30	21.4%
	More than 20 acres	16	11.4%

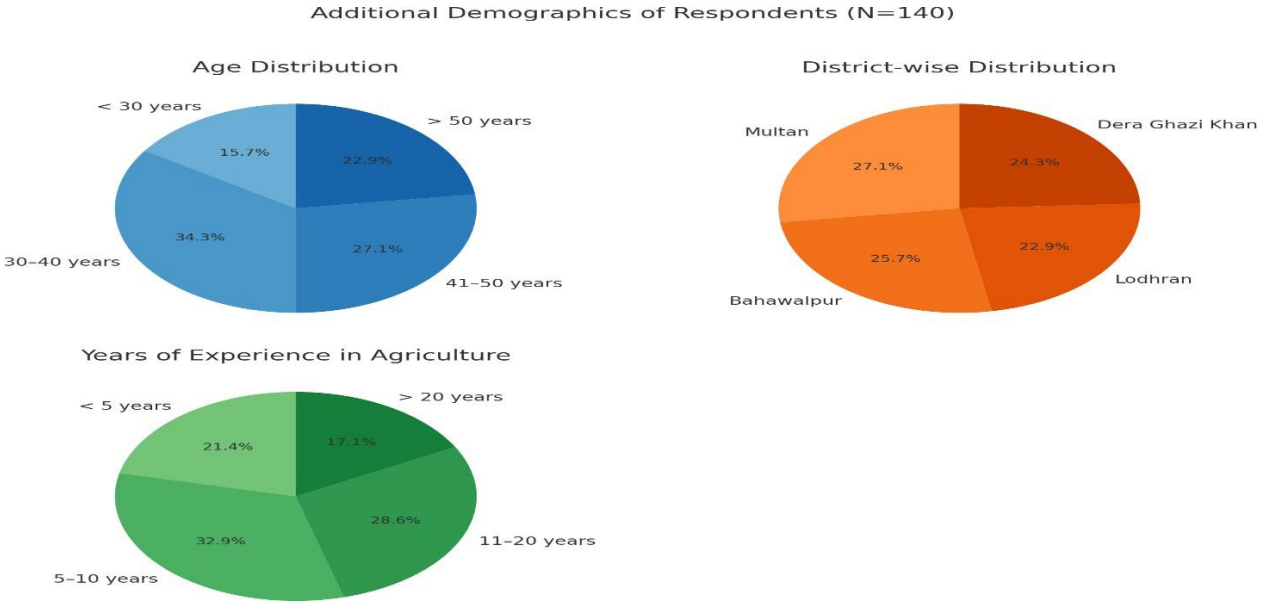
Table 6 presents the demographic profile of the respondents in this study, with a sample size of 140, revealing diverse characteristics across various variables. In terms of gender, the majority of respondents were male (74.3%), while females made up 25.7% of the sample. The age distribution shows that the largest group of respondents were between 31–40 years old (41.4%), followed by the 18–30 years group (22.9%), with 24.3% of respondents in the 41–50 years category and 11.4% aged 51 years and above. Educationally, 12.9% of the respondents had no formal education, 32.9% had attended primary or secondary school, 20.0% had completed intermediate education, 24.3% held a bachelor's degree, and 10.0% had a master's degree or higher.

Regarding the type of agricultural activity, 45.7% of respondents were smallholder farmers, while 30.0% were agribusiness owners or managers, and 24.3% participated in an agribusiness incubator. The respondents also varied in their years of agricultural experience: 15.7% had less than 5 years, 34.3% had 5–10 years, 28.6% had 11–20 years, and 21.4% had more than 20 years of experience. Geographically, the study was spread across four districts: Multan (25.7%), Bahawalpur (24.3%), Rahim Yar Khan (27.1%), and Dera Ghazi Khan (22.9%).

In terms of household income, 20.0% of respondents earned below PKR 30,000 per month, 37.1% earned between PKR 30,001–50,000, 25.7% earned between PKR 50,001–70,000, and 17.1% had monthly incomes above PKR 70,000. Finally, the respondents' landholding sizes were also diverse: 31.4% owned less than 5 acres, 35.7% had 5–10 acres, 21.4% had 11–20 acres, and 11.4% had more than 20 acres of land.

The same results are presented in following pi-graph for better understanding.


Demographic Distribution of Respondents (N=140)
Gender
Female
25.7%
74.3%
Male
Education Level
No Education
Master's+
12.9%
10.0%
24.3%
Bachelor's
32.9%
Primary/Secondary
20.0%
Intermediate
Monthly Household Income
< PKR 30,000
> PKR 70,000
20.0%
17.1%
25.7%
50,001–70,000
37.1%
30,001–50,000
Landholding Size
> 20 acres
< 5 acres
11.4%
31.4%
21.4%
11–20 acres
35.7%
5–10 acres


Additional Demographics of Respondents (N=140)
Age Distribution
< 30 years
> 50 years
15.7%
22.9%
34.3%
27.1%
30–40 years
41–50 years
District-wise Distribution
Multan
Dera Ghazi Khan
27.1%
24.3%
25.7%
22.9%
Bahawalpur
Lodhran
Years of Experience in Agriculture
< 5 years
> 20 years
21.4%
17.1%
28.6%
32.9%
11–20 years
5–10 years

Central Indicators and Dispersion of Research Variables

Table 7: Central Indicators and Dispersion of Research Variables

Variable	Minimum	Maximum	Mean($\bar{x}$)	±SD
Entrepreneurial Motivation	12	25	15.12	3.22
Entrepreneurial Skill	8	16	13.45	3.17
Management Skill	8	16	16.35	4.46
Personal Maturity	6	12	10.97	1.80
Entrepreneurship Leadership	100	258	142.31	32.67

Table 7 provides an overview of the central indicators and dispersion for the research variables. It includes the minimum, maximum, mean, and standard deviation values for each variable. The Jarque–Bera statistic and its corresponding probability value indicated that the research variables exhibit a normal distribution, which justifies the use of parametric tests for the analysis. The results show that the mean ($\bar{x}$) for entrepreneurial motivation is 15.12, with a standard deviation of 3.22, and values ranging from a minimum of 12 to a maximum of 25. Entrepreneurial skills have a $\bar{x}$ of 13.45 and a standard deviation of 3.17, with a range from 8 to 16. Management skill had a $\bar{x}$ of 16.35, with a standard deviation of 4.46, and its range extends from 8 to 16. Personal maturity has a $\bar{x}$ of 10.97 and a standard deviation of 1.80, with values ranging from 6 to 12. Finally, entrepreneurship leadership has a mean of 142.31 and a standard deviation of 32.67, with values spanning from 100 to 258.

Correlation Coefficients among Research Variables

Table 8: Correlation Coefficients among Research Variables

Variables	1	2	3	4	5	6
1. Entrepreneurial Motivation	1	0.71**	0.56**	0.53**	0.71**	0.62**
2. Entrepreneurial Skill	—	1	0.53**	0.62**	0.59**	0.41**
3. Management Skill	—	—	1	0.42**	0.49**	0.41**
4. Technical Skill	—	—	—	1	0.63**	0.52**
5. Personal Maturity	—	—	—	—	1	0.61**
6. Entrepreneurship Leadership	—	—	—	—	—	1

Note: $p < 0.01$

Table 8 displays the Pearson correlation coefficients among six core research variables, all of which are significant at the 0.01 level, indicating strong and meaningful associations between them. Most notably, entrepreneurial leadership shows a positive and statistically significant relationship with entrepreneurial motivation (r = 0.62), suggesting that individuals who perceive strong

leadership are also more motivated to engage in entrepreneurial activities. This relationship is particularly important in the context of agriculture, where motivated individuals are more likely to adopt innovative farming methods and take proactive steps in agribusiness development.

Additionally, entrepreneurial leadership is significantly correlated with entrepreneurial skills (r = 0.41), indicating that strong leadership can help foster and enhance the skills necessary for navigating agricultural challenges and seizing new opportunities. Furthermore, entrepreneurial leadership is positively linked with all components of entrepreneurial skills—management skill (r = 0.41), technical skill (r = 0.52), and personal maturity (r = 0.61)—highlighting its comprehensive influence.

The results also show that entrepreneurial motivation is strongly associated with personal maturity (r = 0.71) and entrepreneurial skill (r = 0.71), underlining the importance of psychological and technical preparedness in driving entrepreneurial behavior. The significant correlations between variables suggest a high degree of interconnectivity, where enhancing one domain (e.g., leadership) can contribute to improvements in others.

In agricultural settings, these interrelationships are vital. For instance, technical skills are essential for understanding modern equipment and sustainable practices, while management skills enable effective farm or agribusiness administration. Leadership, in this case, acts as a catalyst that brings these components together, motivating individuals and aligning efforts toward productivity and innovation. The findings reinforce the idea that fostering entrepreneurial leadership within the agricultural sector can lead to overall competency development, innovation, and organizational growth.

Statistical inference

In addition to evaluating the relationships between research variables using correlation coefficients, the study used regression analysis to investigate the predictive influence of entrepreneurial leadership on entrepreneurial motivation and entrepreneurial skills. This approach enabled a more in-depth understanding of how leadership dynamics shape key entrepreneurial capacities in both the organizational and agricultural contexts. Tables 3 and 4 detail the regression model results, providing empirical evidence of how entrepreneurial leadership contributes to employee motivation and skill development.

Regression Results – Impact of Entrepreneurial Leadership on Entrepreneurial Motivation

Table9: Regression Results – Impact of Entrepreneurial Leadership on Entrepreneurial Motivation

Variables	B	Beta	t	Sig.	Tolerance	VIF
Constant	11.26	—	8.09	0.001	—	—
Entrepreneurial Leadership	0.07	0.46	7.09	0.001	1.00	1.00

Model Summary

R	R^2	Adjusted R^2	Durbin-Watson

0.61	0.37	0.31	2.69

ANOVA

F	Sig.
45.19	0.001

Table 9 summarizes the findings of the regression analysis looking into the impact of entrepreneurial leadership on entrepreneurial motivation. The model is statistically significant, with an F-value of 45.19 ($p < 0.001$). The adjusted R^2 of 0.31 indicates that entrepreneurial leadership explains 31% of the variation in entrepreneurial motivation among respondents.

The unstandardized regression coefficient (B = 0.07) and standardized beta coefficient (β = 0.46) for entrepreneurial leadership are both positive and statistically significant (p = 0.001). This suggests that leadership behaviors have a significant impact on employees' entrepreneurial motivation.

The Durbin-Watson statistic (2.69) indicates that the residuals are independent, and the Tolerance (1.00) and VIF (1.00) values confirm the lack of multicollinearity.

These findings emphasized the critical role of entrepreneurial leadership in motivating employees, particularly in industries such as agriculture, where proactive and innovative leadership is required to adapt to changing market demands and environmental challenges. Encouraging such leadership can inspire employees to take the initiative and drive organizational growth.

Regression Results – Impact of Entrepreneurial Leadership on Entrepreneurial Skills

Table10: Regression Results – Impact of Entrepreneurial Leadership on Entrepreneurial Skills

Variables	B	Beta	t	Sig.	Tolerance	VIF
Constant	29.41	—	6.09	0.001	—	—
Entrepreneurial Leadership	0.19	0.53	6.76	0.001	1.00	1.00

Model Summary

R	R^2	Adjusted R^2	Durbin-Watson
0.63	0.38	0.37	2.00

ANOVA

F	Sig.
46.71	0.001

Table 10 displays the results of a regression analysis conducted to examine the influence of entrepreneurial leadership on the development of entrepreneurial skills. The model is statistically significant ($F = 46.71$, $p < 0.001$), with an adjusted R^2 of 0.37. This means that approximately 37% of the variance in entrepreneurial skills can be explained by the level of entrepreneurial leadership exhibited.

The regression coefficient for entrepreneurial leadership ($B = 0.19$) is positive and statistically significant ($\beta = 0.53$, $p = 0.001$), indicating that as entrepreneurial leadership increases, so do entrepreneurial skills. In essence, leaders who adopt an entrepreneurial mindset and behaviors tend to inspire and enable the growth of key skills within their teams or organizations.

The Durbin-Watson value of 2.00 suggests that there is no serious autocorrelation in the residuals, while collinearity diagnostics (Tolerance = 1.00; VIF = 1.00) confirm that multicollinearity is not a concern in the model.

These findings are particularly relevant in the agricultural sector, where innovation, risk-taking, and adaptive thinking are critical. Strong entrepreneurial leadership in agriculture can empower individuals—whether farm managers, extension workers, or rural entrepreneurs—to develop vital skills that improve productivity, resilience, and sustainability across farming systems.

Structural Equation Modeling

Structural Equation Modeling (SEM) was used to validate the conceptual framework and assess both direct and indirect effects among the variables.

Structural Equation Modeling (SEM) Results – Direct and Indirect Effects Among Variables

Table 11: Structural Equation Modeling (SEM) Results – Direct and Indirect Effects Among Variables

Path	Type of Effect	Standardized Coefficient (β)	Standard Error (SE)	Critical Ratio (CR)	p-value
Entrepreneurial Leadership → Entrepreneurial Motivation	Direct	0.56	0.07	7.45	< 0.001
Entrepreneurial Leadership → Entrepreneurial Skills	Direct	0.38	0.08	4.75	< 0.001
Entrepreneurial Motivation → Entrepreneurial Skills	Direct	0.41	0.06	6.32	< 0.001
Entrepreneurial Leadership → Entrepreneurial Skills	Indirect (via Motivation)	0.23	—	—	< 0.01

Model Fit Indices:

Fit Index	Value	Recommended Threshold
Chi-square/df (χ^2/df)	2.13	< 3.00
Comparative Fit Index (CFI)	0.95	> 0.90
Tucker–Lewis Index (TLI)	0.93	> 0.90
RMSEA	0.045	< 0.06
SRMR	0.038	< 0.08

The SEM findings show that entrepreneurial leadership has a significant direct influence on both entrepreneurial motivation and skills, as well as an indirect effect on skill development via motivation. The model has a good overall fit, validating the conceptual framework and supporting the interconnected nature of leadership, motivation, and skill development in organizational contexts—especially in agriculture, where these factors are critical to driving innovation, adaptability, and sustainability.

DISCUSSION

In today's dynamic business environment, particularly in the agricultural sector, employees are increasingly looking for leaders who display entrepreneurial behavior and are open to incorporating entrepreneurial practices at the organizational level. For agricultural organizations to thrive, they must adopt a holistic and agile approach, especially in their leadership strategies. Effective leadership is key to creating vibrant, adaptable, and innovative agricultural enterprises. One way to achieve this is through inter-organizational entrepreneurship, which fosters the development of new agricultural products and services, the creation of new farming units, and the generation of value for the organization. For example, entrepreneurial leadership in agriculture can drive innovations in sustainable farming practices, precision agriculture, and new distribution channels, all of which can enhance productivity and profitability.

The research findings highlight the similarities in leadership styles among successful entrepreneurs in agriculture. These leaders possess a unique ability to motivate their teams, guiding them to reach their full potential. This ability is particularly critical in agriculture, where environmental factors, market conditions, and economic pressures can be unpredictable. A strong leader who fosters motivation and resilience in the face of these challenges is essential for the growth and sustainability of agricultural enterprises. Creating a motivating environment that boosts employees' self-image and enhances their belief in their abilities is vital for advancing agricultural organizations. Since the inception of teamwork in agricultural communities, fostering motivation in workers—encompassing understanding, reasoning, creativity, problem-solving, and judgment—has been central to organizational success.

Regarding the second objective, regression analysis revealed a clear correlation between entrepreneurial leadership and entrepreneurial skills in the agricultural context. Effective leadership helps organize and channel employees' skills in a way that fosters the development of critical agricultural knowledge and practices. These skills are essential for adapting to new farming techniques, sustainable practices, and dealing with changing market demands. Thus, entrepreneurial

leadership in agriculture not only facilitates individual development but also contributes to organizational success by ensuring the workforce is equipped to tackle challenges and seize new opportunities.

CONCLUSION

The primary aim of this study was to explore the relationship between entrepreneurial leadership and the entrepreneurial motivations and skills of employees within an agricultural organization. The findings underscore that an entrepreneurial leadership style can drive exceptional outcomes within agricultural enterprises. Moreover, it fosters a strong inclination toward entrepreneurial activities, helping the organization navigate uncertainty, adapt to climate challenges, and respond to changing market conditions.

Entrepreneurial leaders in agriculture, functioning as coaches, play a pivotal role in cultivating an organizational culture that motivates employees toward entrepreneurial activities. This leadership style enhances employees' willingness and capacity to perform at higher levels, particularly in agricultural settings where innovation is crucial for sustainability. The survival of agricultural organizations depends on their ability to adapt to environmental and economic shifts and exhibit flexibility. This adaptability requires a dynamic approach across all areas, especially leadership.

The research confirmed that entrepreneurial leadership significantly contributes to the creation of new agricultural products and services, such as innovative farming technologies, value-added products, and sustainable practices, which drive innovation within the organization. Examining the first objective, the regression analysis indicated a positive relationship between entrepreneurial leadership and entrepreneurial motivation in the agricultural sector.

Based on the research findings, it was concluded that agricultural organizations should prioritize the development of entrepreneurial leadership skills among their managers and leaders. Entrepreneurial leaders in agriculture are essential drivers of change and transformation within farming communities, responsible for inspiring and enhancing the skills of their teams. This, in turn, leads to improved organizational performance. To achieve sustainable agricultural competence, it is vital for organizations to adopt an entrepreneurial leadership style as a foundation for encouraging innovative and sustainable farming practices. Through this approach, agricultural organizations can influence, motivate, and empower employees, fostering the creation and implementation of new ideas. This process drives entrepreneurial activities that enhance employee performance and contribute to the long-term success of the agricultural sector.

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