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Identifying Priority Strategies for Entrepreneurial Development in the Poultry Industry: Evidence from Mashhad, Iran

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ABSTRACT

The increasing demand for food, especially poultry products, highlights critical challenges to food security. In this context, agricultural entrepreneurship in the poultry sub-sector plays a vital role in addressing these challenges by enhancing food supply and contributing to economic growth and development. This study specifically focuses on fostering entrepreneurship within the poultry industry in Mashhad, emphasizing its pivotal role in Iran's economy and its contribution to food security. Using an exploratory research method along with SWOT and Ordinal Priority Approach (OPA) analysis, 18 factors influencing entrepreneurship in the poultry industry were identified and weighted, leading to the development and ranking of 14 strategies. The results indicate that strategies such as transferring the tasks related to the poultry industry from the government to the private sector (SO) and using the capacities of knowledge-based companies for innovation in the supply of poultry input (WT) have the highest scores. In contrast, strategies such as organizing workshops and training courses (WO) and hiring skilled labore (ST) have lower scores. The findings suggest practical concepts for poultry entrepreneurs, including branding, technology adoption, establishing international animal welfare standards, collaborating with knowledge-based companies, and privatization under government supervision. These strategies can foster regional development by promoting entrepreneurship, which in turn can increase employment, economic growth, and productivity, ensuring a balanced distribution of opportunities and resources.

Keywords: Ordinal Priority Approach, Regional Development, Strategic Analysis, SWOT, Entrepreneurship.

INTRODUCTION

The dynamic prospects of economic development, increasing population growth, global food demand, and rising income levels have intensified the need for sustainable solutions in the agricultural sector (Tilman *et al*., 2011). This growth in population and income not only

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heightens food consumption but also presents challenges to food security and sustainable development processes (Molotoks *et al.*, 2021; Erdaw and Beyene, 2022). Thus, balancing the rising demand for food with long-term sustainable development is essential (Bijl *et al.*, 2017). As the agricultural sector serves as the cornerstone of any nation's economy (World Bank, 2016), it plays a crucial role in ensuring food security and sustainable development (Pawlak and Kołodziejczak, 2020). A self-sufficient agricultural sector allows resources to be directed toward infrastructure and other areas critical to economic growth, while dependence on food imports can delay the process of sustainable development (Ali *et al.*, 2021, Mohammadi and Saghaian., 2022). In Iran, agriculture is a major economic sector, accounting for approximately 10% of GDP and 15% of total employment (Statistical Centre of Iran, 2021). It not only supplies food, raw materials, and investment for sustainable economic growth (Kleyn and Ciacciariello, 2021), but also serves as the foundation for rural development, supporting income generation, employment, and industrial activities. (Zecca and Bataineh, 2016). Among the vital sub-sectors in Iran's agriculture is the poultry industry, which has transformed from traditional farming practices to a significant player in agricultural production and employment, largely due to substantial capital investment (Zaghari, 2018). The poultry industry contributes to food security, employment, poverty reduction, and economic growth(Shoofiyani *et al.*, 2022), providing around 60% of the per capita animal protein intake through chicken meat and eggs in Iran (Zaghari, 2018).

Despite the substantial role of the poultry industry in food security and economic stability, it faces significant challenges in Iran (Rahimi, 2013). One of the primary issues is the high cost of poultry feed combined with government price controls on poultry meat, aimed at consumer price support (Zamani *et al.*, 2019). While these price controls benefit consumers, they reduce the profitability and incentives for poultry producers, ultimately impacting production levels (Mohammadi *et al.*, 2023). This gap between the current constraints in the industry (high costs and limited incentives) and the desired state of a thriving, self-sustaining poultry sector that fosters growth and innovation represents a critical problem (Mottet and Tempio, 2017). Addressing this gap requires strategic interventions that enhance producer incentives and foster an environment conducive to entrepreneurial activities (Simonov and Girfanova, 2023). Entrepreneurship is crucial in overcoming these challenges and exploiting potential opportunities within the poultry industry (Lin *et al.*, 2021). Agricultural entrepreneurship, defined as the strategic pursuit of market opportunities to initiate and expand business activities (Jafari-Sadeghi *et al.*, 2021), is particularly important in modernizing the poultry sector.

One of the most important goals of entrepreneurship development in agriculture is to modernize agricultural structures and create of a new agricultural environment for job creation (Gholamrezai *et al.*, 2021). In general, Agricultural entrepreneurship, accompanied by the risks of the agricultural sector, creates avenues for employment, increased income, enhanced quality of life, and greater individual participation in the economy. (Mohammadi *et al.*, 2017). An entrepreneurial farmer interprets challenges and environmental changes as opportunities and uses the existing resources to produce new products or services (Aliabadi *et al.*, 2016).

Given the critical role of opportunity recognition in the entrepreneurial process and its potential to advance and strengthen entrepreneurship (Rosca *et al.*, 2020), it is essential to identify and implement effective strategies for entrepreneurial development in agricultural sub-sectors, including the poultry sector, to achieve an optimal level and position in entrepreneurship. In this context, the present study explores the landscape of entrepreneurship in agriculture, with a specific focus on the poultry industry. By examining the challenges and opportunities within this sector, it aims to provide insights for the development of effective entrepreneurial strategies. agricultural entrepreneurship has been investigated in numerous studies.

Table 1. Literature on agricultural entrepreneurship.

Author	Area of study	The goal of the study	Methodology	Results
Pindado and Sánchez (2017)	Europe	Analysing Entrepreneurial Behaviour in New and Existing Investments in European Agriculture.	random effects logit models	Newcomers in agriculture tend to lean more towards entrepreneurship compared to individuals with more prior agricultural experience.
Choudhury and Easwaran (2019)	Brahmaputra Valley, Assam (India)	Examining the Factors Influencing Agricultural Entrepreneurship in the Brahmaputra Valley, Assam.	Qualitative Analysis and Mean Decomposition Analysis	Human resources with limited knowledge and awareness, market facilities, and most importantly, supply and demand, serve as constraints in agricultural entrepreneurship development.
Martinho (2020)	European Union	Exploring Entrepreneurship Dimensions in European Union Agriculture Towards a More Sustainable Sector.	Descriptive Data Analysis and Cobb-Douglas Model-Based Regressions.	Policy tools play a significant role in entrepreneurship, so it is essential to enhance the mutual relationship between agricultural policies and entrepreneurship. Moreover, in agricultural entrepreneurship, economic aspects are pivotal.
Regmi and Naharki (2020)	Nepal	Evaluating the Factors Influencing Agricultural Trade Entrepreneurship.	SWOT	Increasing awareness about agricultural entrepreneurship, human resource development, infrastructure, government support, and establishing special export zones can contribute to harnessing the potential of agricultural trade entrepreneurship in Nepal.
Gholamrezai *et al.* (2021)	Iran	Designing a model for sustainable entrepreneurship among domestic producers of agricultural inputs	Structural Equation Model	Sustainable entrepreneurship is influenced by external factors such as mindset, contextual conditions like education and community understanding, and intervention factors such as government support and the development of technical infrastructure

Existing research (Table 1) has examined the general factors influencing agriculture entrepreneurship, exploring its dimensions and obstacles through various quantitative and qualitative methods, including decision-making approaches (Regmi and Naharki, 2020), economic analysis (Khoshmaram *et al.*, 2019), qualitative analysis (Choudhury and Easwaran, 2019; Khosravipour and Shoeibi, 2022), correlation analysis, and structural equation modelling (Gholamrezai *et al.*, 2021). However, there is a gap in studies where previous research does not specifically focus on entrepreneurship in a sub-sector of agriculture and generally examines the agricultural sector as a whole. This study addresses this gap by focusing on entrepreneurship in the poultry industry and providing strategies for its promotion based on a comprehensive analysis of strengths, weaknesses, opportunities, and threats (SWOT). In other words, the development of entrepreneurship in the poultry industry requires a multi-level approach that considers the macro (industry), meso (sectoral), and micro (firm) levels, as the optimal implementation of many macro-level strategies necessitates their execution at both the meso and firm levels.

On the other hand, it is necessary to formulate entrepreneurship development strategies suitable to each region based on its unique economic, cultural, political, and climatic conditions is essential. Moreover, the integration of SWOT analysis and OPA (Ordinal Priority Approach) in this study represent a new approach that reveals hidden judgments, contradictions and uncertainties of decision makers, which have often been neglected in previous studies. The SWOT analysis is used as a valuable tool for strategic planning, enabling decision-makers to assess internal and external factors crucial for effective program formulation (Vashishtha and Dhawan, 2023). Simultaneously, the OPA, an advancement in Multi-Criteria Decision Making (MCDM), addresses the limitations of traditional methods like WASPAS and BWM. By independently estimating weights of experts, criteria, and options, OPA minimizes pairwise comparisons, enhancing compatibility (Sadeghi *et al.*, 2022).

This study contributes to the existing literature through several innovations. First, by focusing on the poultry industry as a specific agricultural sub-sector, it addresses a research gap in entrepreneurship in small and medium enterprises within this industry. Second, the use of an integrated SWOT-OPA approach, as a novel method in multi-criteria decision-making (MCDM), enables a more comprehensive and precise identification of factors influencing entrepreneurial development. Third, all factors affecting entrepreneurship development have been identified in terms of strengths, weaknesses, opportunities, and threats, providing a better

understanding of the internal and external environments of the poultry industry. Fourth, examining this topic in a new geographical area aids in understanding regional conditions and their impact on entrepreneurship.

The structure of this study is organized as follows: Section 2 reviews and explains the theoretical foundations. Section 3 focuses on the research methodology, while Section 4 presents the results and discussion. Finally, the conclusion is provided in the last section, including recommendations and key insights for fostering entrepreneurship in the poultry sector.

THEORETICAL FOUNDATIONS

Entrepreneurial development strategies refer to a set of planned actions and policies aimed at fostering an entrepreneurial culture, identifying and leveraging innovative opportunities, and building entrepreneurial capacities within organizations or industries. These strategies may include support for innovation, empowerment of human resources, encouragement of risk-taking, and the establishment of supportive infrastructures, all contributing to economic growth and societal value creation. Such approaches are crafted at both macro and micro levels with the goal of enhancing competitiveness and entrepreneurial capabilities (Morris *et al.*, 2009).

In the field of entrepreneurial development strategies, various theories have been proposed, each addressing specific aspects of entrepreneurship and offering insights for enhancing organizational and industrial performance in this domain. Schumpeter's Theory of Creative Destruction (1934) regards entrepreneurship as a force of creative destruction that drives innovation and economic development (Croitoru, 2012). According to this theory, entrepreneurs introduce new products, technologies, and processes, reshaping market structures and creating new opportunities that contribute to economic growth. Kirzner (1973) emphasizes in his Theory of Entrepreneurial Discovery the importance of identifying untapped market opportunities, proposing that entrepreneurs can enhance the economy by addressing and leveraging market imbalances. The Resource-Based View (RBV) by Barney (1991) posits that an organization's unique resources and capabilities can lead to sustainable competitive advantage and entrepreneurial development. Additionally, Innovation Systems Theory Freeman (1987) highlights that innovation and entrepreneurship depend on supportive environments, policies, institutions, and networks, suggesting that entrepreneurial development requires appropriate infrastructure, governmental support, and policies to strengthen innovation and industrial growth. The Cognitive Theory of Entrepreneurship Mitchell *et al.* (2002) focuses

on the cognitive and psychological processes of entrepreneurs, examining the mental and psychological factors involved in identifying and acting upon opportunities. The Theory of Planned Behavior Ajzen (1991) posits that individuals' intentions for entrepreneurial behavior are influenced by three main factors: attitudes toward the behavior, subjective norms, and perceived behavioral control, which help entrepreneurs better understand the determinants of their decision-making processes. Finally, the Entrepreneurial Ecosystem Theory Isenberg, explores the factors that shape the entrepreneurial environment and are essential for entrepreneurial development, such as human capital, venture capital, infrastructure, government policies, and an entrepreneurial culture (Aryal, 2021). Collectively, these theories provide robust theoretical frameworks for fostering entrepreneurial development and assist organizations and policymakers in identifying strengths and opportunities to create environments conducive to entrepreneurial growth and innovation.

In this regard, entrepreneurial development strategies can be classified at three levels: macro (industry), meso (sectoral), and micro (firm). At the macro level, these strategies focus on establishing infrastructure, supportive policies, and an environment conducive to entrepreneurial growth across the entire industry. Examples include creative destruction strategies, based on Schumpeter's theory, which emphasize fostering innovation and new technologies to reshape market structures and create new opportunities; opportunity discovery strategies, grounded in Kirzner's theory, which focus on identifying and capitalizing on new opportunities and addressing market imbalances at the industry level; entrepreneurial ecosystem strategies, which aim to strengthen ecosystem factors like human capital, venture capital, infrastructure, and government policies to support entrepreneurship; and innovation enhancement strategies, derived from Innovation Systems Theory, which build a supportive environment at the industry level through infrastructure, institutions, and policies that encourage sustained innovation.

Meso-level entrepreneurial development strategies, acting as a bridge between macro policies and micro-level actions, focus on strengthening key factors for fostering entrepreneurship within a specific sector. These strategies include creating and enhancing value networks and supply chains, supporting sector-specific innovation and technology, establishing industry associations and cooperatives, and providing training and skill development at the sectoral level. Drawing on the theories of Creative Destruction, Innovation Systems, and Entrepreneurial Ecosystems, these initiatives provide the necessary infrastructure and connections, enabling entrepreneurs to capitalize on new opportunities while enhancing

collaboration and human resources. Additionally, these strategies encourage risk-taking and cultivate an entrepreneurial culture within the industry, creating a foundation for sustainable innovation and growth.

Finally, at the micro level, entrepreneurial development strategies are directed toward identifying, leveraging, and enhancing internal capacities within organizations to foster sustainable innovation and competitiveness. These include resource and capability-based strategies, based on the Resource-Based View (RBV), which strengthen unique organizational resources and capabilities to achieve sustainable competitive advantage; cognitive entrepreneurship strategies, grounded in Cognitive Theory, which develop entrepreneurs' cognitive processes for identifying and utilizing internal opportunities; planned behavior-based strategies, based on the Theory of Planned Behavior, which reinforce factors such as attitudes, subjective norms, and perceived control that influence entrepreneurial intent within the organization; and internal innovation enhancement strategies, which focus on supporting in-house innovation and empowering human resources to develop new ideas and products. Together, these strategies at macro, meso, and micro levels assist industries and organizations in leveraging resources to create environments conducive to entrepreneurial growth and innovation across the poultry industry.

MATERIALS AND METHODS

Study Area

The county of Mashhad, located in the north-eastern region of Iran, was selected as the study area due to its critical role in the agricultural and poultry industries of the country. The county's agricultural potential and its significance in the poultry sector make it an ideal region for investigating entrepreneurial opportunities in agriculture. Mashhad is situated in the north-eastern region of Iran and serves as the capital of Khorasan Razavi Province (Figure 1). Khorasan Razavi Province accounts for 3.9% of Iran's total livestock production, with an annual output of 1,575,727 tons. The province ranks second in egg production with a 13% share and is the third-largest producer of poultry meat in Iran, with an annual production of approximately 120,000 tons (Ministry of Agriculture-Jahad 2021). The share of Mashhad in the agricultural production of Khorasan Razavi province is 13%, holding the first rank among the counties in the province. In terms of the number of livestock units, it also ranks second in the province, accounting for a 10% share (Ministry of agriculture-jihad 2021). In a way that currently, there are 210 poultry farming units in the county of Mashhad, employing 20,414 workers (Ministry

of agriculture-jihad 2021). Therefore, the poultry industry in Mashhad is one of the most significant economic sectors, offering substantial potential for job creation and production growth. Therefore, considering the potential of the county of Mashhad in the production of poultry-related products and the role of agricultural entrepreneurship in the economy, the county of Mashhad was chosen as the study area to ultimately provide solutions for the development of entrepreneurship in this region.

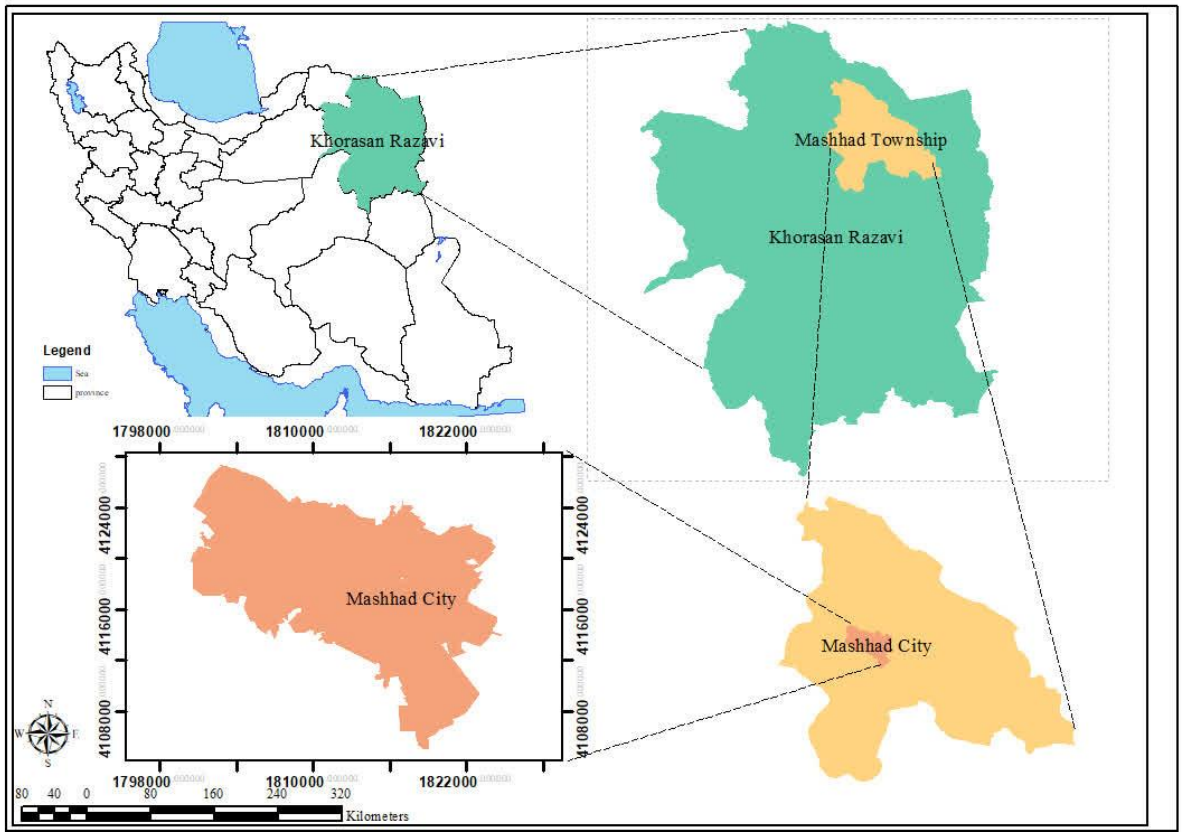

Figure 1. Geographical location of the study area in Khorasan Razavi Province, Iran (Bahraseman *et al.*, 2024).

Statistical Population

In this study, the sampling method used was "Sampling to Achieve Representativeness or Comparability," a form of purposive sampling. Purposive sampling, also known as qualitative sampling, involves intentionally selecting participants to gain specific insights or knowledge. Unlike methods that aim to establish generalizable findings or fixed rules, purposive sampling focuses on deepening understanding within a specialized context. In this approach, researchers determine sample size based on mental processes, seeking participants who will provide the most comprehensive information about the phenomenon under investigation. Accordingly, twenty interviews were conducted with stakeholder groups in September 2023 to examine the

challenges related to enhancing and developing entrepreneurship in small and medium-sized enterprises within the poultry industry.

This study utilized field research, literature review, interviews, and surveys to identify strategies for enhancing entrepreneurship in the poultry industry. Accordingly, twenty interviews were conducted with stakeholder groups in September 2023 to examine the challenges related to enhancing and developing entrepreneurship in small and medium-sized enterprises within the poultry industry. Table 2 displays the frequency of individuals' participation in the interviews related to the research.

Table 2. The rate of engagement of stakeholders in interview sessions.

Participants	Number of participants
Government organization managers	7
Academic individuals	5
Poultry farmers	8
Total	20

Methodology

This study adopts a pragmatic paradigm with a quantitative and exploratory approach to identify and prioritize strategies for entrepreneurial development in the poultry industry. Utilizing SWOT analysis integrated with the Ordinal Priority Approach (OPA), the research employs a systematic and quantitative method for evaluating and ranking strategic factors. The OPA model was applied using specialized web-based software for multi-criteria decision analysis. Ataei et al. (2020) and Mahmoudi et al. (2023) were the developers of this software.

Figure 2, shows the incorporation of the SWOT-OPA methodology used in this study to identify the factors influencing entrepreneurship development in the poultry industry. The primary aim of this approach is to outline and prioritize alternative strategies for the progression of entrepreneurship within the poultry sector. The process of identifying factors influencing entrepreneurship in the poultry industry included conducting a SWOT analysis. Following this, the OPA approach was implemented to assess the weight of each SWOT sub-factor, and the OPA method was employed to prioritize alternative strategies. The subsequent section presents a brief overview of the methodologies applied in this study.

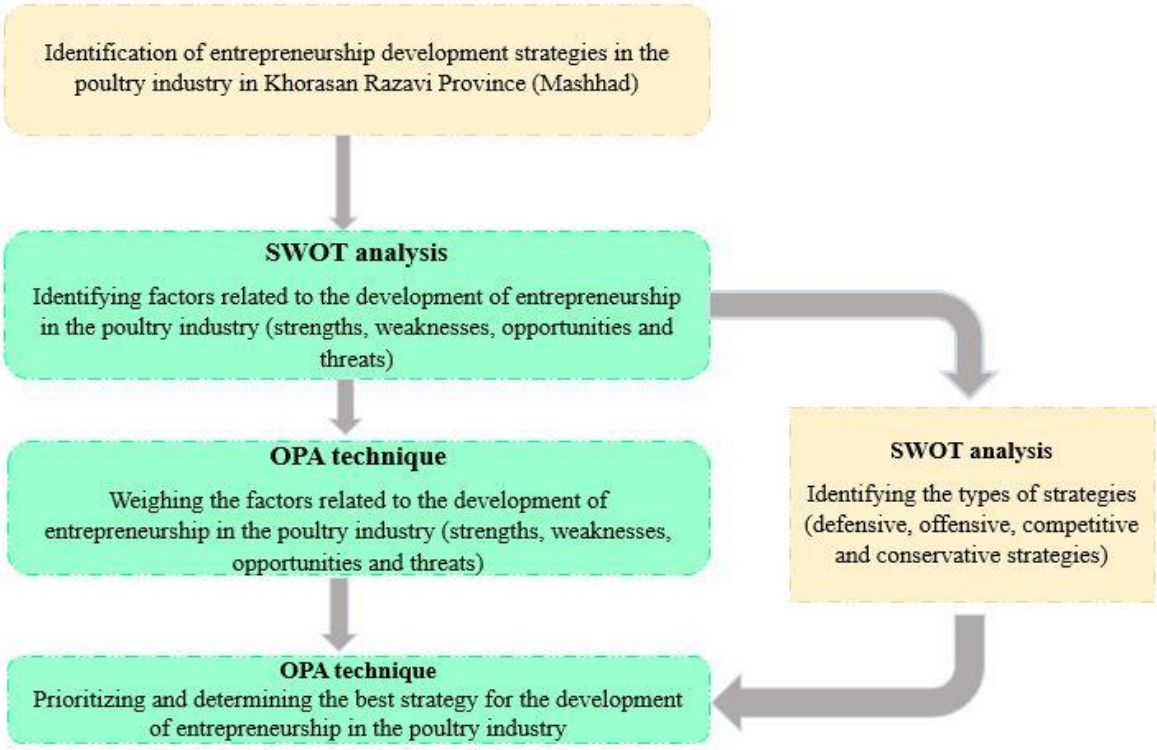

Figure 2. The framework of SWOT-OPA in the study.

SWOT

The SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis is a strategic planning tool used to evaluate internal and external factors that affect an organization's success (Taherdoost and Madanchian, 2021). Strengths and weaknesses are internal factors, while opportunities and threats are external. Strategies derived from SWOT analysis include (see Figure 3): aggressive strategies (SO), leveraging strengths to capitalize on opportunities; conservative strategies (WO), mitigating weaknesses by exploiting opportunities; competitive strategies (ST), utilizing strengths to mitigate the impact of threats; and defensive strategies (WT), employed when external threats align with internal weaknesses. In this scenario, the defensive strategy aims to prevent negative internal weaknesses from being highly vulnerable to external threats (Raddad, 2022). This analysis is widely applied in business, marketing, and decision-making to formulate strategies based on a thorough understanding of influencing factors (Stefan *et al.*, 2021). This study employs SWOT analysis to propose strategies for enhancing entrepreneurship in Mashhad's poultry industry.

Figure 3. The configuration of the SWOT matrix.

Internal / External	Strengths	Weaknesses
Opportunities	SO strategy (offensive)	WO strategy (conservative)
Threats	ST strategy (competitive)	WT strategy (defensive)

Ordinal Priority Approach (OPA)

The OPA (Ordinal Priority Approach) is a significant advancement within the field of Multiple Criteria Decision Making (MCDM) theory through a linear mathematical model. This approach was suggested by (Ataei *et al.*, 2020). The OPA method supports both individual and group decision-making by simultaneously considering experts, criteria, and alternatives. It excels in calculating rankings, expert weights, and criteria weights without the need for conventional normalization, and can handle incomplete data. This means that when experts lack sufficient knowledge or relevant experience in the judgment process, they can skip certain options related to a specific criterion, thereby enhancing decision-making accuracy and efficiency (Sadeghi *et al.*, 2022).

OPA, unlike similar decision-making techniques, calculates alternatives rankings, expert weights, and criteria weights simultaneously. OPA does not require aggregation methods for gathering expert judgments in group decision-making. Furthermore, OPA does not utilize pairwise comparison matrices for alternatives and criteria (Mahmoudi *et al.*, 2021). Instead, it requires ordinal data for criteria and alternatives. In order to explain the steps of OPA, it is essential to have a clear understanding of the variables, indexes, and sets as outlined in Table 3.

Table 3. Sets, indexes, and variables used in the OPA.

Sets	
I	Set of experts $\forall i \in I$
J	Set of criteria $\forall j \in J$
K	Set of alternatives $\forall k \in K$
Indexes	
i	Index of the experts $(1, \ldots, p)$
j	Index of preference of the criteria $(1, \ldots, n)$
k	Index of the alternatives $(1, \ldots, m)$
Variables	
Z	The objective function
$W_{ijk}{}^{r}$	Weight (importance) of k^{th} alternative based on j^{th} criterion by i^{th} expert at r^{th} rank
Parameters	
i	The rank of expert i
j	The rank of criterion j
r	The rank of alternative k

The computational process of OPA encompasses the following stages:

Step 1 involves the process of identifying the criteria and sub-criteria for alternatives selection. Step 2 entails determining the ordinal preferences for criteria and sub-criteria. Step 3 involves constructing the linear model (Equation 1) using the information collected from steps 1 and 2. Subsequently, can be using appropriate software such as LINGO, MATLAB, Python, or similar tools to solve the model.

$$Max\ Z$$

s.t.

$$Z \leq i\ (j\ (r\ (W_{ijk}{}^{r} - W_{ijk}{}^{r+1}))) \quad \forall\ i, j, k \text{ and } r$$

$$Z \leq ijmW_{ijk}{}^{m} \quad \forall\ i, j \text{ and } k$$

$$\sum_{i=1}^{p}\sum_{j=1}^{n}\sum_{k=1}^{m} W_{ijk} = 1 \qquad (1)$$

$$W_{ijk} \geq 0 \quad \forall\ i, j \text{ and } k \quad \text{where } Z\text{: Unrestricted in sign}$$

After successfully solving the model, Eq. (2) is employed to determine the alternatives weights.

$$W_k = \sum_{i=1}^{p}\sum_{j=1}^{n} W_{ijk} \quad \forall\ k \qquad (2)$$

In order to determine the criteria weights, Equation (3) is applied.

$$W_j = \sum_{i=1}^{p}\sum_{k=1}^{m} W_{ijk} \quad \forall\ j \qquad (3)$$

For the computation of expert weights, Equation (4) is utilized.

$$W_i = \sum_{j=1}^{n}\sum_{k=1}^{m} W_{ijk} \quad \forall\ i \qquad (4)$$

Subsequently, these weights can be utilized for decision-making and the ranking of criteria, experts, and alternatives.

RESULT AND DISCUSSION

Effective factors influencing entrepreneurship development in the poultry subsector in Mashhad have been identified based on library research, expert interviews, field studies, and

relevant literature (Column 3 in Table 4). The results of the evaluation matrix of internal and external factors for entrepreneurial development in the poultry subsector, using the OPA approach, are reported in Table 4. Among the four strengths ranked by the expert community, Factor S4, which is the presence of poultry farmers' unions and associations, secured the highest ranking with a score of 0.0922.

Experts in this research find that poultry farmers' unions and associations in Mashhad are crucial for poultry entrepreneurship due to their role in information exchange, resource procurement, and understanding market challenges. These organizations help reduce production costs, improve access to quality resources, and foster an entrepreneurial culture. This supports findings by Karami and Agahi (2018), who noted that cooperatives and supplier associations positively impact the capabilities and motivation of poultry business owners.

Among the identified six weaknesses, the low capacity of input production and the shortage of poultry inputs in the country (W6) has been assigned the highest ranking with a score of 0.09813. Experts identify the scarcity of poultry inputs and reliance on imports as a major weakness, leading to higher production costs and reduced competitiveness. This shortage hampers export performance, limits new business development, and poses challenges for entrepreneurs in the poultry industry. It may even lead entrepreneurs to fear a lack of input, discouraging them from initiating new businesses. In this regard, reference can be made to (Zaghari, 2018), which identifies poultry nutrition and the shortage of production inputs as one of the main challenges in poultry farming in Iran.

Table 4. Matrix of internal and external factors evaluation for entrepreneurial development in the poultry subsector.

SWOT factors		SWOT sub-factors	Weight	Rank[2]	Overall Rank
Strengths (S)	S1	High market share	0.9027	2	12
	S2	Presence of significant technical knowledge and specialized human resources in the poultry sub-sector	0.7750	4	14
	S3	The conditions and capacities of the province in the field of poultry-related productions	0.8431	3	13
	S4	Existence of poultry farmers' unions and associations	0.9222	1	9

[2] The "Rank" in the fifth column represents the ranking of each strength, weakness, opportunity, and threat individually, indicating, for example, which strength ranks highest among the four listed strengths. In contrast, the "Rank" in the last column provides an overall ranking across all strengths, weaknesses, opportunities, and threats, showing which factor holds the highest rank among them collectively.

Weakness (W)	W1	Insurance coverage shortages and weaknesses in support programs during crisis conditions	0.9789	2	3
	W2	Lack or insufficiency of poultry product processing and storage industries	0.9552	4	6
	W3	Low diversity of processed products	0.9444	5	7
	W4	Low competitiveness	0.9279	6	8
	W5	Lack of attention to branding	0.9554	3	5
	W6	Low capacity for the production of inputs in the country and a shortage of poultry inputs	0.9813	1	2
Opportunities (O)	O1	Proximity to the border for exports	0.9662	1	4
	O2	Market growth and increased demand for poultry products	0.9131	2	11
	O3	Existence of private sector capital	0.1751	4	18
	O4	One of the priority sub-sectors in agriculture for the government	0.2045	3	16
Threats (W)	T1	Sanctions on the country and difficulties in obtaining equipment such as drugs, vaccines, and technology transfer	0.6808	3	15
	T2	Fluctuations in raw material prices	0.9853	1	1
	T3	Market imbalance and inefficiency of supportive policies for production	0.9196	2	10
	T4	Existence of contagious avian diseases	0.1863	4	17

Source: research findings.

According to the results of the OPA approach for evaluating the matrix of external factors, it is evident that, as per the experts' opinions, the highest priority among the four identified opportunities for entrepreneurial development in the poultry subsector is attributed to the proximity to borders for exports (O1). This criterion has been assigned the highest ranking with a score of 0.9662. Proximity to borders creates new export opportunities and encourages producers to optimize production by adhering to international standards, which enhances product quality and competitiveness. Additionally, export activities driven by production growth provide a platform for entrepreneurial development and increased employment. In support of this conclusion, reference can be made to the study conducted by Doan (2022), which has found that changes in international trade market dynamics in Vietnam and access to export markets significantly impact the activities of entrepreneurial enterprises. Furthermore, Khanal (2018) considers access to distant Western markets as a motivator for entrepreneurial farmers in Nepal.

The analysis of identified threats has shown that changes in raw material prices (T2) have

obtained the highest score of 0.9853. Fluctuations in raw material prices increase production costs, reducing profitability and raising final product prices, which negatively impacts marketability and competitiveness. This is particularly challenging for new entrepreneurs and small businesses in the poultry industry. As a result, these price changes can dampen investment decisions, entrepreneurial enthusiasm, and business development strategies. In this regard, the findings of the study by Shoofiyani *et al.* (2022) also demonstrated that price fluctuations in commodities (such as chicken feed or vaccines/boosters) have resulted in increased costs and impact the activities of the supply chain.

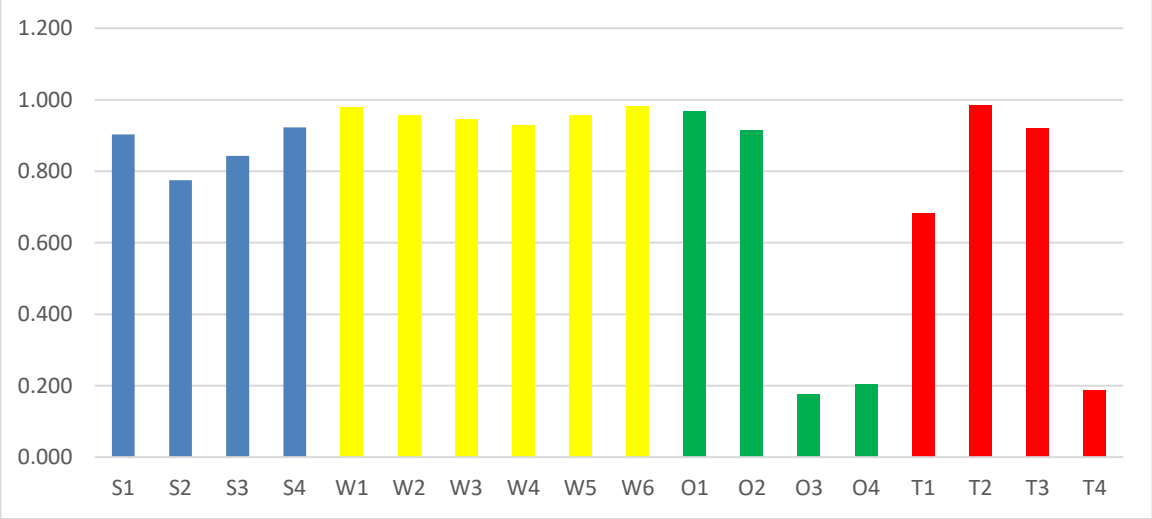

Figure 4. Overall ranking of criteria (sub-factors within the SWOT analysis).

As illustrated in Figure 4, a comprehensive comparison was conducted for all sub-factors of the SWOT analysis pertaining to entrepreneurship in the poultry industry The foremost factors, in descending order of significance, include fluctuations in raw material prices (T2) with a weight of 0.9853, low capacity for the production of inputs in the country and a shortage of poultry inputs (W6) with a weight of 0.9813, and Insurance coverage shortages and weaknesses in support programs during crisis conditions (W1) with a weight of 0.9789.

After identifying the internal and external factors related to entrepreneurial development in the poultry subsector and scoring them using the OPA method, practical strategies for entrepreneurship development in this area were extracted (Table 5). Subsequently, the prioritization of these strategies was performed using the OPA technique. Columns three and four of Table 5, respectively, indicate the final weights and rankings of the strategies.

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Table 5. Entrepreneurship development strategies ranking in the poultry subsector using the OPA technique.

	Strategies	Weight	Rank
ST1	Establishing a strong network (strengthening collaboration)	0.0722	8
WO1	Investing in Infrastructure	0.0833	6
WO2	Transferring responsibilities related to the poultry industry from the government to the private sector	0.1119	1
SO1	Improving Animal Welfare	0.0260	14
WT1	Utilizing the capacities of knowledge-based companies for the provision of new inputs	0.0968	2
WT2	Branding and marketing	0.0931	3
WO3	Diversifying income streams	0.0728	7
ST2	Implementing biosecurity measures	0.0463	12
WT3	Expanding insurance coverage	0.0921	4
ST3	Market Research	0.0615	10
WO4	Utilizing Innovative Technologies in Production Units	0.0666	9
SO2	Conducting workshops and training courses for entrepreneurs in this field	0.0359	13
SO3	Developing an entrepreneurial culture in the poultry industry (to enhance risk-taking)	0.0507	11
WT4	Financial provision	0.0907	5

364 Source: research findings.

365 As depicted in Table (5), this study suggests four defensive strategies, three offensive strategies,
366 three competitive strategies, and four conservative strategies.

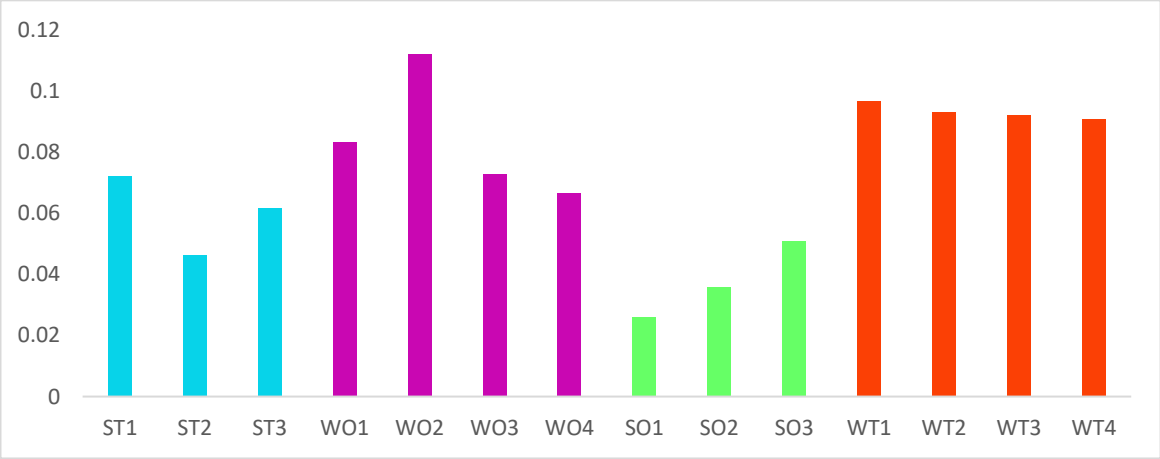

Figure 5. Overall ranking of strategies.

367 As shown in Figure 5, all strategies related to entrepreneurship development in the poultry
368 industry were compared. Transferring responsibilities related to the poultry industry from the
369 government to the private sector (WO2), utilizing the capacities of knowledge-based companies
370 for the provision of new inputs (WT1), and Branding and marketing (WT2) have been
371 recognized as the important strategies, each assigned weights of 0.1119, 0.0968, and 0.0931,
372 correspondingly. According to the results of Table 5 and figure 5, the most important

entrepreneurship development strategies in the poultry subsector include:

Rank 1: Transferring responsibilities related to the poultry industry from the government to the private sector (WO2)

The institutional structure of Iran's poultry industry is characterized by a significant level of government intervention, which, while aimed at stabilizing prices and ensuring food security, often leads to inefficiencies. Government-supervised privatization, as a context-specific strategy, seeks to leverage the capabilities of the private sector to mitigate bureaucratic delays and foster innovation. This approach aligns with the successful implementation of similar strategies in other sectors, where gradual privatization under regulatory oversight has improved operational flexibility and market responsiveness (Barcho, 2019). In the context of Iran, the role of cohesive cooperatives and associations within the poultry sector can be expanded to take on responsibilities traditionally held by the government, such as input procurement and market coordination. This shift reduces bureaucratic barriers, enhances entrepreneurs' autonomy, and creates a competitive environment conducive to new business ventures. Additionally, the transfer of tasks must be complemented by robust institutional support, including clear regulatory frameworks and incentives, to ensure a smooth transition and sustained growth in entrepreneurial activities. This finding is consistent with the research by Ilham (2015), which highlights that privatization, combined with government oversight, can enhance the performance of poultry industry businesses. This approach strengthens production structures, reduces economic vulnerabilities, and improves efficiency.

Rank 2: Utilizing the capacities of knowledge-based companies for the provision of new inputs (WT1)

Knowledge-based companies lead innovation in nutrition, health, and technology within the poultry industry, creating new opportunities for entrepreneurs in breeding and processing. Their close connections with the market help entrepreneurs effectively understand and respond to market needs (Bayo and Emmanuel, 2020). By offering solutions to optimize input production and supply high-quality inputs, these companies reduce risks and enhance production management. Leveraging their expertise is crucial for improving processes and fostering entrepreneurial growth in the poultry sector.

Rank 3: Branding and marketing (WT2)

Branding creates a unique business identity and, when paired with effective marketing,

protects against market fluctuations, ensuring stability. In the poultry industry, where price volatility is frequent, developing and reinforcing product brands is crucial for long-term success (Doan, 2022). In this regard, Shoofiyani *et al.* (2022) also emphasized that new entrants in the poultry industry, particularly entrepreneurs, must enhance consumer awareness of their brand. One effective approach to enhance product awareness is the implementation of a comprehensive marketing strategy. Additionally, Subagja *et al.* (2022) consider continuous improvement in the quality of poultry slaughterhouse products and a strong brand as essential elements for competing with similar businesses.

Rank 4: Expanding insurance coverage (WT3)

Insurance coverage can support producers against economic losses resulting from various factors such as natural disasters, diseases, or market fluctuations (Alam *et al.*, 2020). Insurance provides compensation to poultry farmers in Iran if the entire farm stock (flock) is lost, which can diminish the motivation of entrepreneurs in the poultry sub-sector. In general, increasing insurance coverage in the poultry industry (Payment of indemnity in case of losses and damage to a percentage of the flock) can create a more secure environment for entrepreneurs, encouraging them to take risks and expand their businesses.

Rank 5: Financial provision (WT4)

Access to financial resources is crucial for establishing, expanding, and managing poultry businesses, as it allows for easier procurement of production inputs and mitigates risks from price fluctuations (Daemane and Muroyiwa, 2022). Favorable financial conditions also encourage innovation in production, marketing, and management, improving efficiency and fostering entrepreneurial growth in the poultry industry. In this regard, Aqajani *et al.* (2008) have identified financial provision through low-interest loans as a primary need for entrepreneurs, which is considered one of the main responsibilities of the government. Additionally, De Clercq *et al.* (2009) identified a lack of capital and financial resources as obstacles to entrepreneurship.

Rank 6: Investing in Infrastructure (WO1)

Investment in infrastructure, including poultry farms, transportation, and processing facilities, enhances efficiency and stimulates local economies, contributing to business competitiveness (Subagja *et al.*, 2022). Such investments create a favorable environment for entrepreneurship in the poultry industry. Regmi and Naharki (2020), emphasize that supporting

agriculture entrepreneurship requires investment in essential infrastructures like R&D systems, transportation, marketing, and storage facilities. These investments are crucial for promoting and sustaining entrepreneurship in the sector.

Rank 7: Diversifying income streams (WO3)

Diversifying income streams in the poultry industry through multiple sources, like meat and egg sales or innovative technologies, reduces risks and increases business resilience. This strategy enhances competitiveness, attracts new customers, and strengthens market position, enabling entrepreneurs to capitalize on various opportunities while minimizing risks.

Rank 8: Establishing a strong network (strengthening collaboration) (ST1)

Being part of a network allows entrepreneurs to stay informed about market trends, consumer preferences, and industry innovations. Networking and access to exhibitions and conferences can strengthen the entrepreneurial culture and relationships among entrepreneurs, while also helping them better manage challenges and risks. (Ribeiro *et al.*, 2021). Networking can reduce the lack of entrepreneurial culture, leading to the identification and creation of diverse job opportunities (Regmi and Naharki, 2020). Aqajani *et al.* (2008) emphasized in their study that implementing entrepreneurial ideas requires an understanding of prerequisites, which can be achieved through organizing exhibitions and conferences.

Rank 9: Utilizing Innovative Technologies in Production Units (WO4)

The adoption of innovative technologies, such as the Internet of Things (IoT), in poultry production enhances safety, product quality, and access to international markets, leading to increased productivity and profitability (Kraus *et al.*, 2021). These efficiency gains motivate entrepreneurs in the poultry sector. Developing organizational data strategies and attracting specialized IoT talent are crucial for leveraging these technologies to boost revenue and drive entrepreneurial motivation (Shoofiyani *et al.*, 2022).

Rank 10: Market Research (ST3)

When entrepreneurs have a clear understanding of market needs and opportunities through market research, they can tailor their poultry-related ventures to meet those demands more effectively, enhancing the entrepreneurship landscape in the sector. Identifying innovative opportunities and assessing market demand ensures successful product supply, supporting the growth and sustainability of poultry businesses (Khoshmaram *et al.*, 2019). ()() 2024), proposed

that increasing consumer awareness of the benefits of export products could lead to higher demand and strengthen exports to target markets. Additionally, Hosseinzadeh *et al.* (2022), emphasized that focusing on the development of new products, understanding global markets, and engaging with the broader community leads to growth and improvement in agricultural entrepreneurship activities. Moreover, Regmi and Naharki (2020) concluded that the lack of agricultural research is a significant barrier to the overall development of the agricultural sector in Nepal.

Rank 11: Developing an entrepreneurial culture in the poultry industry (to enhance risk-taking) (SO3)

Developing an entrepreneurial culture fosters innovation and encourages individuals to embrace new ideas, increasing their willingness to take risks. This, in turn, supports entrepreneurial development and the establishment of innovative businesses in the poultry industry. In this context, can refer to the findings of the study by Fritsch and Wyrwich (2018), who stated that the prevalence of entrepreneurial culture has had a significant impact on the emergence of new businesses in Germany.

Rank 12: Implementing biosecurity measures (ST2)

Poultry production generates by-products such as waste from droppings, hatcheries, and feed, raising environmental and health concerns (KA & Benson, 2014). Environmental pollution, widespread diseases, etc., impact entrepreneurship development and societal progress (Doan, 2022). Biosecurity measures in the poultry industry reduce the risk of disease transmission and potential economic losses and mortality. These measures also help meet regulatory standards and consumer expectations, ensuring the quality and safety of poultry products.

Rank 13: Conducting workshops and training courses for entrepreneurs in this field (SO2)

Workshops provide entrepreneurs with market insights and specialized knowledge, enhance their confidence and decision-making abilities, and offer motivation for successful business investments (Galvão *et al.*, 2020). So, empowering individuals through enhancing their knowledge and skills levels in performing activities leads to development (Abdollahi Kalourazi *et al.*, 2020). Furthermore, Karami and Agahi (2018) stated that if creativity and innovation in agriculture are combined with individuals' skills and managerial capabilities, agricultural

entrepreneurship will experience significant growth.

Rank 14: Improving Animal Welfare (SO1)

Improving animal welfare by providing proper spaces, nutrition, and natural conditions reduces stress and disease, enhances product quality (Buller *et al.*, 2020). High-quality products are more readily accepted in the market and can command better prices. Additionally, improving animal welfare can align businesses with local and international regulations and standards, aiding in the recognition and validation of businesses while promoting ethical and social standards associated with animal husbandry (FAO 2023). Enhancing animal welfare in the poultry industry fosters entrepreneurial opportunities in equipment production, welfare-focused management, and consulting services. This not only creates new business prospects but also supports the long-term sustainability of poultry farming.

By amalgamating these approaches, one can improve the advancement of entrepreneurship in the poultry sector, consequently fostering the generation of economic prospects and augmenting the sustainability and adaptability of the food system.

CONCLUSION

This research has been conducted with an approach based on entrepreneurship reinforcement in the poultry sub-sector in Mashhad. The strategies proposed in this study specifically advocate the importance of actions such as market research and branding, utilization of innovative technologies, improvement of animal welfare, investment in infrastructure, implementation of environmental health measures, financial provision, expansion of insurance services, delegation of responsibilities to the private sector, and leveraging the capabilities of knowledge-based companies. These actions, in conjunction with each other, lead to entrepreneurship enhancement and sustainable development of the poultry industry through market improvement, increased productivity, risk reduction, and entrepreneurial culture development. Also, these measures empower entrepreneurs in the poultry industry to manage various challenges and opportunities effectively.

1. Transfer of Responsibilities to the Private Sector

The study results indicate that the primary strategy for fostering entrepreneurship in the poultry industry is the transfer of responsibilities related to the poultry industry from the government to the private sector and associations. Delegating responsibilities to the private sector can enhance flexibility, competition, and private investment, as the private sector can

more swiftly address market needs without bureaucratic delays. Therefore, it is recommended, given the existence of cohesive cooperatives and associations, that tasks related to the poultry industry be transferred from the government to the private sector, with the government overseeing the execution of these responsibilities.

2. Utilization of Knowledge-Based Companies for Innovation

The second priority is to leverage the capabilities of knowledge-based companies to drive innovation in poultry input production. Given the constraints on input production in Iran and the challenges faced by poultry producers, utilizing these companies for developing new inputs is crucial. Therefore, it is recommended to create platforms for communication between knowledge-based companies and poultry producers to facilitate technology transfer. Additionally, monitoring and evaluating the impact of these innovations is essential. In this regard, allocating experimental farms for this purpose can ensure the enhancement of production processes through the capabilities of knowledge-based companies.

3. Establishment of International Animal Health Standards and Financial Incentives for Export

At the international level, it is recommended that governments establish and advance international animal health standards and provide financial incentives to entrepreneurs for entering global markets and boosting exports, thereby increasing competition in the poultry industry. Additionally, governments should leverage successful practices from leading countries to enhance this sector's contribution to global food security.

4. Organizing Workshops and Training Courses for Entrepreneurs The findings of this study can have practical implications for producers in the poultry sub-sector, such as organizing workshops and training courses. These initiatives can boost the confidence and motivation of entrepreneurs, encouraging them to initiate and succeed in business ventures.

5. Improving Access to Financial Resources and Expanding Insurance Coverage Other implications include improving government support programs to facilitate access to financial resources for entrepreneurs. Additionally, creating employment policies in the poultry industry and expanding insurance coverage to support producers in managing production risks are highlighted as potential outcomes of these results.

Study Limitations and Recommendations for Future Research

This study, while comprehensive, has certain limitations that should be acknowledged. Addressing these limitations in future research could enhance the reliability and applicability of findings related to entrepreneurial development in the poultry industry.

1. **Regional Limitation**: This research is focused specifically on Mashhad, which may limit the generalizability of its findings to other regions. To address this, future research should replicate similar studies across different regions with distinct cultural, economic, and regulatory conditions. This comparative approach would allow for region-specific strategies that better suit local needs.
2. **Timeframe Constraints**: The data collection was conducted over a limited period, capturing a snapshot of the industry at a particular time. Given the dynamic nature of markets, technologies, and government policies, future studies should consider a longitudinal design. This would provide a more comprehensive view of how changes over time affect the entrepreneurship landscape, allowing for adaptive strategies that remain relevant as conditions evolve.
3. **Sector-Specific Scope**: This research is confined to the poultry industry, potentially limiting its applicability to other agricultural sub-sectors. Future studies could expand the scope to include similar agribusiness sectors, such as livestock or aquaculture. This broader approach would yield comparative insights, highlighting unique challenges and opportunities across agricultural industries.

Addressing these limitations can guide future research toward more robust, versatile, and contextually relevant findings that better inform strategies for fostering entrepreneurship in agriculture.

REFERENCES

Abdollahi Kalourazi, M., Baghersalimi, S., Seidavi, A., 2020. Analysis the Key Proponents of Poultry Industry Development Using Forecasting Approach. Iranian Journal of Animal Science Research 12, 529-548.

Ajzen, I., 1991. The Theory of planned behavior. Organizational Behavior and Human Decision Processes.

Alam, A.F., Begum, H., Masud, M.M., Al-Amin, A.Q., Leal Filho, W., 2020. Agriculture insurance for disaster risk reduction: A case study of Malaysia. International Journal of Disaster Risk Reduction 47, 101626.

Ali, E.B., Agyekum, E.B., Adadi, P., 2021. Agriculture for sustainable development: A SWOT-AHP assessment of Ghana's planting for food and jobs initiative. Sustainability 13, 628.

605 Aliabadi, V., Ataiee, P., Movahedi, R., 2016. The effect of strategic thinking and social capital
606 on recognition of entrepreneurial opportunities among rural youths (Case study: Kangavar
607 County). Journal of Research and Rural Planning 5, 95-110.
608 Aqajani, A., Karimi, M., Mohammadi, M., 2008. Present an integrated model of factors
609 affecting information technology in entrepreneurial activities. 1th National Conference on
610 entrepreneurship, creativity and future organizations, pp. 25-26.
611 Aryal, A.K., 2021. Domains of entrepreneurial ecosystem and its impact on entrepreneurship.
612 Journal of Business and Social Sciences 3, 11-28.
613 Ataei, Y., Mahmoudi, A., Feylizadeh, M.R., Li, D.-F., 2020. Ordinal priority approach (OPA)
614 in multiple attribute decision-making. Applied Soft Computing 86, 105893.
615 Bahraseman, S.E., Firoozzare, A., Zhang, C., Yousefian, N., Skominas, R., Barati, R., Azadi,
616 H., 2024. Reviving the forgotten legacy: Strategies for reviving qanats as sustainable
617 solutions for agricultural water supply in arid and semi-arid regions. Water research 265,
618 122138.
619 Barcho, M.K., 2019. Organizational and economic aspects of technical and technological
620 modernization of the poultry farming. IOP Conference Series: Earth and Environmental
621 Science. IOP Publishing, p. 012113.
622 Barney, J., 1991. Firm resources and sustained competitive advantage. Journal of management
623 17, 99-120.
624 Bayo, P.L., Emmanuel, K., 2020. Knowledge-based entrepreneurship: an agent for economic
625 development. Journal DOI 6, 32-42.
626 Bijl, D.L., Bogaart, P.W., Dekker, S.C., Stehfest, E., de Vries, B.J., van Vuuren, D.P., 2017. A
627 physically-based model of long-term food demand. Global environmental change 45, 47-
628 62.
629 Buller, H., Blokhuis, H., Lokhorst, K., Silberberg, M., Veissier, I., 2020. Animal welfare
630 management in a digital world. Animals 10, 1779.
631 Choudhury, K., Easwaran, K., 2019. Agricultural entrepreneurship in lower Brahmaputra
632 valley, Assam. Journal of Global Entrepreneurship Research 9, 1-13.
633 Croitoru, A., 2012. Schumpeter, JA, 1934 (2008), The theory of economic development: An
634 inquiry into profits, capital, credit, interest and the business cycle. Journal of comparative
635 research in anthropology and sociology 3, 137-148.

636 Daemane, T., Muroyiwa, B., 2022. Factors influencing credit access for rural small-scale
637 farmers in Lesotho: Evidence from maize farmers in Masianokeng. World Journal of
638 Advanced Research and Reviews 15, 757-768.
639 De Clercq, D., Menzies, T.V., Diochon, M., Gasse, Y., 2009. Explaining nascent entrepreneurs'
640 goal commitment: An exploratory study. Journal of Small Business & Entrepreneurship 22,
641 123-139.
642 Doan, K.H., 2022. The SWOT analysis of community-based entrepreneurship development in
643 vietnam. Management Strategies 2, 79-90.
644 Erdaw, M.M., Beyene, W.T., 2022. Trends, prospects and the socio-economic contribution of
645 poultry production in sub-Saharan Africa: a review. World's Poultry Science Journal 78,
646 835-852.
647 Freeman, C., 1987. Technology policy and economic performance: Lessons from Japan.
648 Science Policy Research Unit University of Sussex and Pinter Publishers.
649 Fritsch, M., Wyrwich, M., 2018. Regional knowledge, entrepreneurial culture, and innovative
650 start-ups over time and space—an empirical investigation. Small Business Economics 51,
651 337-353.
652 Galvão, A., Marques, C., Ferreira, J.J., 2020. The role of entrepreneurship education and
653 training programmes in advancing entrepreneurial skills and new ventures. European
654 Journal of Training and Development 44, 595-614.
655 Gholamrezai, S., Aliabadi, V., Ataei, P., 2021. Recognizing dimensions of sustainability
656 entrepreneurship among local producers of agricultural inputs. Journal of Environmental
657 Planning and Management 64, 2500-2531.
658 Hosseinzadeh, M., Samadi Foroushani, M., Sadraei, R., 2022. Dynamic performance
659 development of entrepreneurial ecosystem in the agricultural sector. British Food Journal
660 124, 2361-2395.
661 Ilham, N., 2015. Government Policies on Small Scale Poultry Business and Environmental
662 Health in Indonesia.
663 Jafari-Sadeghi, V., Garcia-Perez, A., Candelo, E., Couturier, J., 2021. Exploring the impact of
664 digital transformation on technology entrepreneurship and technological market expansion:
665 The role of technology readiness, exploration and exploitation. Journal of Business
666 Research 124, 100-111.

667 Karami, S., Agahi, H., 2018. SWOT analysis of strategies for agricultural entrepreneurs
668 empowerment. International Journal of Agricultural Management and Development 8, 307-
669 320.
670 Khanal, R., 2018. Non-tariff barriers holding back Nepal's export trade. Retrieved from The
671 kathmandu Post: http://kathmandupost. ekantipur. com/news/2018-03-29/non-
672 tariffbarriers-holding-back-nepals-export-trade. html.
673 Khoshmaram, M., Shiri, N., Savari, M., 2019. Effect of Climate Change Dimensions on
674 Agricultural Entrepreneurial Opportunities Recognition. International Journal of
675 Agricultural Management and Development (IJAMAD) 9, 307-318.
676 Khosravipour, B., Shoeibi, A., 2022. The role and necessity of entrepreneurship in rural and
677 agricultural development. Geography and Human Relationships 5, 205-220.
678 Kirzner, I., 1973. Competition and entrepreneurship. Chicago. Univ. Of Chicago Press.
679 Kleyn, F., Ciacciariello, M., 2021. Future demands of the poultry industry: will we meet our
680 commitments sustainably in developed and developing economies? World's Poultry
681 Science Journal 77, 267-278.
682 Kraus, S., McDowell, W., Ribeiro-Soriano, D.E., Rodríguez-García, M., 2021. The role of
683 innovation and knowledge for entrepreneurship and regional development. Taylor &
684 Francis, pp. 175-184.
685 Lin, S., Winkler, C., Wang, S., Chen, H., 2021. Regional determinants of poverty alleviation
686 through entrepreneurship in China. Business, entrepreneurship and innovation toward
687 poverty reduction. Routledge, pp. 41-62.
688 Mahmoudi, A., Deng, X., Javed, S.A., Yuan, J., 2021. Large-scale multiple criteria decision-
689 making with missing values: project selection through TOPSIS-OPA. Journal of Ambient
690 Intelligence and Humanized Computing 12, 9341-9362.
691 Martinho, V.J.P.D., 2020. Agricultural entrepreneurship in the European Union: Contributions
692 for a sustainable development. Applied sciences 10, 2080.
693 Ministry of Agriculture Jihad. (2023). Agricultural Yearbook of Iran. Retrieved from
694 https://www.maj.ir/.
695 Mitchell, R.K., Busenitz, L., Lant, T., McDougall, P.P., Morse, E.A., Smith, J.B., 2002. Toward
696 a theory of entrepreneurial cognition: Rethinking the people side of entrepreneurship
697 research. Entrepreneurship theory and practice 27, 93-104.
698 Mohammadi, H., Saghaian, S., Boccia, F., 2023. Antibiotic-Free Poultry Meat Consumption
699 and Its Determinants. Foods 12, 1776.

Mohammadi, H., Saghaian, S., & Alizadeh, P. (2017). Prioritization of Expanded Marketing Mix in Different Stages of the Product Life Cycle: The Case of Food Industry. *Journal of Agricultural Science and Technology*, 9(5), 993-1003.

Mohammadi, H., and S. Saghaian. (2022). "Factors Affecting Consumption of Different Forms of Medicinal Plants: The Case of Licorice." *Agriculture*, 12(9), 1453. https://doi.org/10.3390/agriculture12091453. Impact Factor: 3.408

Molotoks, A., Smith, P., Dawson, T.P., 2021. Impacts of land use, population, and climate change on global food security. Food and Energy Security 10, e261.

Morris, M.H., Kuratko, D.F., Covin, J.G., 2009. Corporate entrepreneurship & innovation. Cengage Learning.

Mottet, A., Tempio, G., 2017. Global poultry production: current state and future outlook and challenges. World's poultry science journal 73, 245-256.

Pawlak, K., Kołodziejczak, M., 2020. The role of agriculture in ensuring food security in developing countries: Considerations in the context of the problem of sustainable food production. Sustainability 12, 5488.

Pindado, E., Sánchez, M., 2017. Researching the entrepreneurial behaviour of new and existing ventures in European agriculture. Small Business Economics 49, 421-444.

Raddad, S.H., 2022. Strategic planning to integrate urban agriculture in Palestinian urban development under conditions of political instability. Urban Forestry & Urban Greening 76, 127734.

Rahimi, M., 2013. Food safety status of poultry meat and egg in Iran. World's Poultry Science Journal 69, 401-406.

Regmi, S., Naharki, K., 2020. A SWOT analysis of agribusiness entrepreneurship in Nepal. Food & Agribusiness Management 1, 60-65.

Ribeiro, M.A., Adam, I., Kimbu, A.N., Afenyo-Agbe, E., Adeola, O., Figueroa-Domecq, C., de Jong, A., 2021. Women entrepreneurship orientation, networks and firm performance in the tourism industry in resource-scarce contexts. Tourism Management 86, 104343.

Rosca, E., Agarwal, N., Brem, A., 2020. Women entrepreneurs as agents of change: A comparative analysis of social entrepreneurship processes in emerging markets. Technological forecasting and social change 157, 120067.

Sadeghi, M., Mahmoudi, A., Deng, X., 2022. Adopting distributed ledger technology for the sustainable construction industry: evaluating the barriers using Ordinal Priority Approach. Environmental science and pollution research 29, 10495-10520.

Shoofiyani, O.S., Belgiawan, P.F., Hariyanto, H., Enriko, I.K.A., Sulyani, A.C., Larasati, N., 2022. Proposed Marketing Strategy to Increase Digital Smart Poultry Market Readiness in West Java. International Journal of Current Science Research and Review 5, 2867-2880.

Simonov, K.V., Girfanova, N.A., 2023. Managing a high-tech startup: A case of machine vision for the poultry industry. Управленец 14, 47-61.

Stefan, D., Vasile, V., Oltean, A., Comes, C.-A., Stefan, A.-B., Ciucan-Rusu, L., Bunduchi, E., Popa, M.-A., Timus, M., 2021. Women entrepreneurship and sustainable business development: Key findings from a SWOT–AHP analysis. Sustainability 13, 5298.

Subagja, H., Kusuma, S.B., Imam, S., 2022. Pioneering Establishment of Teaching Factory Poultry Slaughterhouse at Politeknik Negeri Jember Based on SWOT Analysis. 2nd International Conference on Social Science, Humanity and Public Health (ICOSHIP 2021). Atlantis Press, pp. 218-223.

Taherdoost, H., Madanchian, M., 2021. Determination of business strategies using SWOT analysis; Planning and managing the organizational resources to enhance growth and profitability. Macro Management & Public Policies 3, 19-22.

Tilman, D., Balzer, C., Hill, J., Befort, B.L., 2011. Global food demand and the sustainable intensification of agriculture. Proceedings of the national academy of sciences 108, 20260-20264.

Vashishtha, E., Dhawan, G., 2023. FMDB Transactions on Sustainable Management Letters.

Zaghari, M., 2018. Challenges of poultry production and nutrition in Iran. Strategic Research Journal of Agricultural Sciences and Natural Resources 3, 169-180.

Zamani, O., Bittmann, T., Loy, J.P., 2019. Demand peaks and cost pass-through: The case of Iran's poultry market. Agribusiness 35, 657-674.

Zecca, F., Bataineh, A.O., 2016. Challenge and potential of future agricultural development in Jordan: role of education and entrepreneurship. Academic Journal of Interdisciplinary Studies 5, 11-19.