Vol. 5, Issue 4, 2025 (October – December)
ISSN 2710-4532 (Online) ISSN 2710-4524 (Print) ISSN 2710-4540 (ISSN-L)
Journal of Educational Research & Social Sciences Review (JERSSR)

A Comprehensive Analysis of the Broiler Poultry Industry in Maimana: Challenges, Opportunities, and Development Pathways

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Abstract

*This paper presents a comprehensive analysis of the broiler poultry industry in Maymana city, Afghanistan, aiming to identify its potentials, challenges, and propose strategies for sustainable development. Employing a mixed-methods approach, the study collected quantitative and qualitative data from all 17 active broiler farms in the city through direct observation, interviews, and questionnaires. The findings reveal significant challenges hindering the industry's potential. Key issues include a critically high mortality rate of **15.4%**, far exceeding the global standard of 5%, and dilapidated infrastructure, with **40%** of farms deemed structurally unsuitable. Consequently, annual production is suboptimal at approximately **193,000 birds**, failing to meet local demand. Despite these weaknesses, the industry possesses significant opportunities, including strong regional demand for poultry meat, availability of suitable land, and high potential for job creation. The study concludes that the Maimana broiler industry is at a critical juncture. A transition towards sustainability requires an integrated strategy focusing on modernizing infrastructure, enhancing technical expertise through training, and developing a local value chain to reduce import dependency. Such coordinated efforts are essential to harness the industry's potential for economic growth and food security in the region.*

Keywords: Broiler Poultry Farming, Development Potential, Sustainable Development, Structural Challenges, Infrastructure and Equipment, Management and Technical Knowledge, Support and Investment

Introduction

The broiler poultry industry serves as a vital sector for ensuring food security and creating employment opportunities, particularly in developing nations such as Afghanistan (Faizy et al., 2022). With its potential to provide an affordable and accessible source of high-quality protein, this industry is strategically important for the country's economic stability and the nutritional well-being of its population. Maymana city, as a significant urban center in Faryab province, possesses favorable conditions—including available land and growing market demand—to become a major hub for chicken meat production.

Despite this clear potential, the poultry industry in Afghanistan, and specifically in regions like Maymana, is confronted with numerous systemic challenges that severely hinder its growth and sustainability. Preliminary observations point towards issues such as dilapidated infrastructure, outdated equipment, a shortage of technical and specialized knowledge, and significant marketing difficulties. These obstacles prevent farmers from achieving optimal productivity and profitability, thereby limiting the sector's overall contribution to the local economy.

While the general problems of the Afghan poultry sector have been documented, there is a significant lack of detailed, empirical research focusing on the specific dynamics within key regional centers. This research paper, therefore, aims to fill this gap by providing a comprehensive, evidence-based analysis of the broiler poultry industry in Maymana city. The primary objective is to identify the precise structural, managerial, and economic challenges, uncover potential opportunities for

growth, and propose practical, data-driven strategies for its sustainable development. To situate this analysis within the broader scientific context, the following section provides a detailed review of the existing literature on the topic.

Literature Review

The global broiler poultry industry stands as a critical engine for economic development and a fundamental component of international food security. Its capacity to provide high-quality, affordable animal protein makes it indispensable in addressing the nutritional needs of a growing world population (Amalbekova & Muratova, 2023). In developing nations like Afghanistan, the industry's role extends beyond mere food production; it serves as a vital source of employment and a catalyst for rural economic activity, offering a pathway out of poverty for many small-scale farmers (Nivedha et al., 2024). Despite its immense potential, the sector in Afghanistan and similar developing regions is beset by a complex web of interconnected challenges that consistently hinder its growth and sustainability.

A primary theme emerging from the literature is the pervasive issue of inadequate infrastructure and outdated technology. Research consistently demonstrates a strong correlation between modern farm infrastructure and production efficiency. For instance, Omid, Khanali, and Zand (2018) highlighted the critical role of proper insulation and climate control systems in reducing energy costs and minimizing bird stress, which directly impacts mortality and growth rates. In Afghanistan, studies from various provinces reveal a stark reality where a significant percentage of farms operate in substandard, often traditional, structures lacking modern equipment for ventilation, heating, and biosecurity (Shaiq et al., 2024). This infrastructural deficit creates a cascade of negative consequences, from heightened disease risk to suboptimal production outputs, trapping farmers in a cycle of low profitability.

Compounding the infrastructural problem is the widespread deficiency in technical expertise and modern management practices. Effective poultry farming is a science-driven enterprise requiring knowledge in nutrition, disease prevention, and environmental management. A study conducted in Parwan province, Afghanistan, found a direct link between poor farm performance and the farmers' limited access to specialized training and veterinary consultation (Zrawar et al., 2023). This knowledge gap manifests in poor biosecurity protocols, improper flock placement planning, and suboptimal feeding strategies, which collectively contribute to alarmingly high mortality rates. Research on broiler flock management has shown that even slight adjustments in stocking density or feed formulation can significantly influence animal welfare and economic returns (Lukić, 2022; Slegers et al., 2024). The absence of such technical knowledge at the farm level leaves the Afghan industry ill-equipped to compete or even operate sustainably.

The third major challenge, and perhaps the most overarching, is the economic vulnerability stemming from a fragmented value chain and heavy dependence on imported inputs. The broiler industry in Afghanistan relies almost entirely on other countries for essential inputs like day-old chicks, high-quality feed, and veterinary medicines. This reliance exposes producers to significant price volatility in external markets and results in a substantial outflow of capital from the region (Shaiq et al., 2024). Economic analyses from neighboring Pakistan confirm that unpredictable input costs are a primary threat to the financial viability of poultry farms (Khan, Liaqat, & Khan, 2022). Without local hatcheries, feed mills, and processing facilities, the industry remains fragile and unable to capture the full economic value of its products. The development of an integrated local value chain is thus not just an opportunity for growth but a necessity for survival (Zhang, Ren, & Bai, 2023).

In conclusion, the existing literature paints a clear picture: the broiler industry in Afghanistan is caught in a paradox. On one hand, it holds immense potential to enhance food security and drive economic growth, supported by strong local demand. On the other, it is crippled by systemic weaknesses in infrastructure, technical capacity, and economic structure. While studies by Zrawar et al. (2023) and Shaiq et al. (2024) have provided invaluable insights at the provincial level, a granular, city-specific analysis is currently missing. Understanding how these broader challenges manifest in the unique socio-economic context of a key urban center like Maymana is essential for crafting targeted, effective interventions. This study, therefore, aims to fill this gap by providing a deep-dive analysis of the Maimana broiler industry, thereby contributing context-specific knowledge to the broader discourse on poultry sector development in Afghanistan.

Materials and Methods

Research Design

This study employed a mixed-methods approach, integrating both quantitative and qualitative data to provide a comprehensive analysis of the broiler poultry industry in Maymana city. The research is classified as applied and descriptive-analytical, aiming to document the current state of the industry, identify its core challenges and opportunities, and propose evidence-based strategies for sustainable development. The research process began with a thorough review of existing literature, followed by a field study to collect primary data directly from poultry farms.

Population and Sample

The target population for this research consisted of all active broiler poultry farms located in Maymana city. Due to the manageable number of farms and the objective of achieving a comprehensive overview, a census approach was adopted instead of sampling. Consequently, all 17 active farms operating in the city at the time of the study were included, ensuring a complete and accurate representation of the industry's local landscape.

Data Collection Instruments

A multi-instrument approach was utilized to gather primary data, ensuring a rich and triangulated dataset:

- **Semi-structured Questionnaire:** A comprehensive questionnaire was designed and administered to farm owners. It included closed-ended questions to collect quantitative data on measurable variables (e.g., farm size, production volume, mortality rates, equipment types) and open-ended questions to gather qualitative insights into farmers' opinions, challenges, and suggestions.
- **In-depth Interviews:** Semi-structured, face-to-face interviews were conducted with farm owners and industry experts. An interview guide was used to explore topics such as management practices, market access, biosecurity challenges, and experiences with government support in greater detail.
- **Direct Observation:** Field visits to all 17 farms were conducted to directly observe and document physical conditions, including the state of infrastructure (e.g., housing, insulation), equipment functionality, and adherence to biosecurity protocols.
- **Document Analysis:** Where available, existing farm records and documents were reviewed to supplement and verify the information gathered through other methods.

Variables of the Study

The study examined two main categories of variables:

- **Independent Variables:** These encompassed factors influencing the industry's performance, including the status of farm infrastructure and equipment, management and biosecurity practices, production conditions, marketing channels, government policies, and the technical knowledge of the workforce.
- **Dependent Variable:** The primary dependent variable was the overall performance and sustainability of the broiler industry in Maymana, measured through indicators such as productivity, profitability, and the creation of employment opportunities.

Data Analysis

The collected data were analyzed using methods appropriate for their nature. Quantitative data obtained from the closed-ended questions of the questionnaire were analyzed using descriptive statistics (e.g., frequencies, percentages, and averages) to generate key performance indicators (KPIs) such as the 15.4% mortality rate and the finding that 40% of farms possess unsuitable structures. Qualitative data from interviews, open-ended questions, and observation notes were analyzed using thematic content analysis. This process involved systematically identifying, coding, and categorizing recurring patterns and themes to build a deep, nuanced understanding of the industry's operational realities and challenges. The integration of both analyses provided a holistic view of the Maimana broiler industry.

Results

The findings of this study reveal that the broiler poultry industry in Maymana city, despite its considerable potential, is constrained by a series of interconnected structural, managerial, and economic challenges. These issues collectively hinder productivity and profitability. The detailed

findings are presented below, with quantitative overviews provided in the SWOT analysis (Table 1) and the Key Performance Indicator (KPI) dashboard (Table 2).

Farm Distribution and Biosecurity Conditions

Poultry farms are predominantly scattered in four directions around the city, often situated within agricultural lands and orchards. While this dispersion provides access to primary resources, it complicates systematic monitoring and sanitary control, thereby increasing the risk of disease transmission between farms. The close proximity of some farms to each other and to the city center also elevates the risk of rapid disease outbreaks. A significant biosecurity lapse was observed in the form of limited or absent fencing on many farms, indicating insufficient control over the entry of potential disease-carrying animals.

Infrastructure and Structural Deficiencies

A primary finding is the dilapidated state of physical infrastructure. As indicated in Table 2, 40% of the farms operate in unsuitable structures, which are typically built from traditional materials like raw adobe and mud and fall significantly below modern standards. The absence of proper insulation in roofs, often constructed with just wood and iron, leads to substantial energy loss and extreme fluctuations in internal temperature and humidity. The use of inappropriate farm dimensions and variable ceiling heights further contributes to stressful conditions for the poultry, ultimately reducing production efficiency. While basic disinfection with lime wash is practiced, it is insufficient for effective pest and disease control, highlighting an urgent need for infrastructure rehabilitation.

Equipment and Technological Gaps

Significant shortcomings were observed in the equipment used on farms. Although standard feeders, drinkers, and basic ventilation systems are common, the technology is often outdated. A critical deficiency is the lack of advanced, automated systems for controlling environmental factors such as temperature, humidity, and lighting. Farmers' heavy reliance on manual electric and fuel heaters, coupled with the limited use of hygrometers, points to a low awareness of modern environmental control methods. This technological gap not only increases production costs and vulnerability to power outages but also directly contributes to reduced efficiency and higher poultry mortality.

Farm Management and Technical Expertise

From a managerial perspective, adherence to best practices is inconsistent. While disinfectants like lime solution and formalin are used, full compliance with hygiene protocols, especially for feeders and drinkers, is limited. Planning appears to be imprecise, as evidenced by variable time intervals between chick placements. Furthermore, the common practice of stocking at a density of **8 to 10 birds per square meter**, while seemingly optimizing capacity, exceeds recommended standards and leads to health problems and reduced productivity (Table 2).

A critical weakness is the industry's heavy dependence on external sources for one-day-old chicks, which are imported from other provinces and neighboring countries. This reliance highlights the absence of local hatcheries in Maymana. Finally, the limited contact between farmers and technical experts, such as veterinarians and nutritionists, deprives them of the necessary knowledge to improve farm management, diagnose diseases, and optimize nutrition, leaving them ill-equipped to handle operational challenges.

Production Performance and Key Indicators

The cumulative impact of these challenges is reflected in the industry's poor performance metrics. The annual production of approximately 193,000 birds is substantially below the region's potential capacity, indicating a severe underutilization of resources (Table 2). Most alarmingly, the average mortality rate stands at 15.4%, a figure that is highly suboptimal and drastically exceeds the global industry standard of below 5%. This critical indicator points to systemic failures in management, hygiene, and environmental control. Our findings suggest that technical, technological, and managerial factors contribute almost equally to this high mortality, with respective shares of 34%, 33.4%, and 32.5%.

Overarching Challenges and Opportunities

In summary, the primary obstacles to the development of Maymana's broiler industry include outdated infrastructure, reliance on imported inputs, a lack of technical knowledge, and poor access to financial resources. These challenges have discouraged investment and slowed industry growth. Despite these significant hurdles, valuable opportunities exist. The growing regional demand for chicken meat, coupled with the availability of suitable land and a favorable climate, provides a strong foundation for

expansion. Key opportunities include establishing local hatcheries and feed mills to reduce import dependency, creating modern processing facilities (slaughterhouses) to develop the value chain, and generating significant employment across these new sectors. The interplay of these internal and external factors, which are detailed in the SWOT analysis (Table 1) and quantified in the KPI dashboard (Table 2), underscores the critical need for strategic intervention to unlock the industry's potential.

Table 1: A SWOT Analysis of the Broiler Chicken Industry in Maimana City

Strengths (Internal)	**Weaknesses (Internal)**
• Availability of suitable and ample land in peri-urban areas.	• **Dilapidated Infrastructure:** 40% of farms possess substandard structures (e.g., mud and clay construction, lacking insulation).
• Relatively easy access to transportation routes and sales markets.	• **Outdated Equipment:** Deficiency in modern systems for controlling environmental factors such as temperature, humidity, and lighting.
• Favorable climate for poultry farming.	• **Poor Management Practices:** Non-adherence to biosecurity protocols and suboptimal flock placement planning.
• Growing regional demand for broiler meat.	• **Dependence on Imports:** High reliance on imported inputs, primarily day-old chicks and feed.
	• **Limited Technical Expertise:** Insufficient consultation with veterinarians and poultry nutritionists.
	• **High Mortality Rate:** An average mortality rate of 15.4%, which significantly exceeds industry standards.
	• **Low Productivity:** Annual production of 193,000 birds, which is below the actual capacity of the farms.
Opportunities (External)	**Threats (External)**
• **Job Creation:** Potential for employment generation through the establishment of new farms, hatcheries, and feed mills.	• **Price Volatility:** Instability in the prices of key inputs, including feed, medication, and fuel.
• **Government Support:** Potential to access financial incentives, training programs, and support for infrastructure development.	• **Avian Diseases:** High risk of epidemic outbreaks due to the high density of farms in the area.
• **Reducing Import Dependency:** Opportunity to establish local feed mills and hatcheries to decrease reliance on foreign supply.	• **Competition from Imports:** Threat posed by cheaper imported broiler meat to the local market.
• **Value Chain Development:** Opportunities to establish modern processing plants (slaughterhouses), veterinary services, and marketing channels.	• **Capital Scarcity:** Financial barriers to establishing new farms or modernizing existing ones.
	• **Shortage of Skilled Labor:** Lack of trained personnel in the region for farm management and operations.

Table 2: Key Performance Indicator (KPI) Dashboard for the Maimana Broiler Industry

Key Performance Indicator (KPI)	**Current Value**	**Status (Optimal/Suboptimal)**	**Brief Explanation**
Annual Production Volume	193,000 birds	Suboptimal	Considerably below the region's potential capacity.
Mortality Rate	15.4%	Highly Suboptimal	Global standard is below 5%; indicative of a critical management and biosecurity issue.
Dependence on Day-Old Chick Imports	High	Suboptimal	Poses high risk and results in foreign exchange outflow; necessitates the establishment of domestic hatcheries.
Stocking Density	8-10 birds/m²	Acceptable (with caution)	At the threshold of the standard, but may induce stress given the current infrastructure.

Structural of Farms	Condition	40% Unsuitable	Highly Suboptimal	Immediate investment is required for renovation and optimization of existing farm structures.

Discussion

The findings of this study reveal a significant paradox within the broiler poultry industry of Maimana city: an enterprise with considerable potential for economic growth and employment, yet severely constrained by systemic deficiencies in infrastructure, management, and economic structure. This situation, where high local demand for poultry meat coexists with underperforming local production, is a common challenge in developing agricultural sectors globally (Gabbassova, Dossanova, & Lim, 2024). Our analysis provides a granular view of these challenges and aligns with broader research on the determinants of success in the poultry sector.

A primary finding of this research is the dilapidated state of physical infrastructure, with 40% of farms deemed unsuitable and a widespread lack of modern equipment for environmental control (Table 2). This issue extends beyond mere inefficiency; the lack of proper insulation and climate control systems directly contributes to increased energy costs, heightened bird stress, and consequently, the alarmingly high mortality rate of 15.4%. This corroborates the findings of Omid, Khanali, & Zand (2018), who emphasize the critical role of modern infrastructure in optimizing production. The underlying cause for this infrastructural deficit, as identified in our qualitative data, is a profound lack of capital. This financial barrier creates a vicious cycle: farmers cannot afford to modernize, leading to low productivity and profitability, which in turn prevents capital accumulation for future investment.

Beyond physical assets, our results highlight critical deficiencies in management practices and human capital. The high mortality rate is not solely an infrastructural problem but also a direct indicator of poor biosecurity protocols, inadequate nutritional management, and limited access to technical expertise. This lack of a skilled workforce is a major impediment. As argued by Zrawar et al. (2023), the empowerment of farmers through specialized training is fundamental to improving farm performance and disease management. The absence of such programs in Maimana leaves farmers ill-equipped to handle the complexities of modern poultry farming.

Economically, the industry's vulnerability is exacerbated by its heavy dependence on imported inputs, particularly day-old chicks and feed. This reliance not only exposes producers to significant price volatility in external markets but also results in capital outflow from the region and makes the local market susceptible to competition from cheaper imported products. However, this critical weakness simultaneously illuminates a significant opportunity for vertical integration and value chain development. The establishment of local hatcheries, feed mills, and modern processing plants represents the most strategic pathway toward reducing import dependency, stabilizing costs, and capturing greater economic value within Maimana.

Ultimately, the Maimana broiler industry is at a critical juncture. The internal weaknesses of poor infrastructure and limited technical knowledge are pitted against the external opportunities of growing market demand. The path to sustainable development requires a coordinated, multi-faceted approach, as the challenges are interconnected and demand integrated solutions.

Conclusion

The broiler poultry industry in Maimana city is in a state of arrested development, characterized by a significant gap between its high potential and its current underperformance. This study concludes that the industry's growth is systematically hindered by three interconnected factors: **(1)** dilapidated physical infrastructure and outdated technology, **(2)** a critical lack of technical expertise and modern management practices among farmers, and **(3)** a fragile economic structure heavily reliant on volatile imported inputs. While opportunities such as strong market demand and land availability exist, they cannot be effectively harnessed without addressing these fundamental weaknesses. Therefore, isolated interventions are unlikely to succeed. A sustainable and profitable future for Maimana's poultry industry is contingent upon the implementation of a comprehensive, integrated strategy that simultaneously modernizes infrastructure, empowers farmers with knowledge, and develops a resilient local value chain.

Recommendations

Based on the findings and conclusions of this study, the following strategic recommendations are proposed to foster the sustainable development of the broiler poultry industry in Maimana city:

1. **Upgrading Infrastructure and Technology:** Modernize farms with standard structures, implement efficient equipment, utilize renewable energy sources to reduce costs, and establish effective waste management systems.
2. **Strengthening Management and Expertise:** Enhance the knowledge and skills of farmers through specialized training programs, establish technical support centers, improve on-farm biosecurity, and promote the use of modern management technologies.
3. **Developing the Value Chain:** Establish modern, hygienic hatcheries and high-quality feed mills to reduce import dependency. Create standard slaughterhouses and packaging units to increase the value-added of local products.
4. **Improving Marketing and Access to Markets:** Develop direct distribution channels to reduce costs, establish local retail points, build strong local branding, and utilize digital marketing to reach wider consumer bases.
5. **Attracting Investment and Governmental Support:** Provide low-interest credit facilities for farm development, offer government support for infrastructure projects, create tax incentives for investors, and establish a dedicated fund to support the industry.
6. **Emphasizing Sustainability and Animal Welfare:** Enforce adherence to environmental standards in all production stages, promote the use of renewable energy, ensure high standards of animal welfare on farms, and guarantee the production of safe, high-quality products for consumers.

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