

Determinants of Commercialising Indigenous Chicken Production in South Africa: New Evidence Post-COVID-19

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ABSTRACT

Commercialising indigenous chicken production offers substantial potential for smallholder farmers in developing countries to improve rural livelihoods and alleviate poverty. However, despite strong market demand for indigenous chickens, few farmers have successfully scaled up production to commercial levels since the COVID-19 pandemic. This study investigated factors influencing the commercialisation of indigenous poultry production systems using a cross-sectional research design. A total of 150 farmers were surveyed, and a multiple regression model was applied to identify key determinants of commercialisation. The findings indicate that access to extension services ($p < 0.01$), gender ($p < 0.05$), household size ($p < 0.05$), loadshedding ($p < 0.01$), transportation costs ($p < 0.01$), reduced income ($p < 0.05$), market distance ($p < 0.01$), and COVID-19-related disruptions ($p < 0.05$) significantly influence commercialisation levels. Regression analysis confirmed that loadshedding and market access were among the most critical constraints, with farmers facing severe operational challenges due to inconsistent electricity supply and limited market penetration. Additionally, post-pandemic trends, including persistent supply chain disruptions and rising feed costs, continue to hinder commercialisation efforts. To address these challenges, the study recommends targeted government interventions, such as improving extension services, investing in value-adding processing equipment, and establishing centralised transportation systems. Additionally, policies should consider the unintended consequences of market interventions to avoid potential distortions. Strengthening access to

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markets and mitigating transaction costs could enhance commercialisation prospects and contribute to the sustainable development of the indigenous poultry sector.

Keywords: Commercialisation, Household Commercialisation Index, Indigenous Chickens, Multinomial Logistic Regression Model, Small-Scale Farmers.

1. INTRODUCTION

The commercialisation of small-scale agriculture entails expanding production and marketing capacity to transition successfully from subsistence to commercial farming. For many African countries that depend on the agricultural sector for economic growth and development, commercialisation of agricultural practices proves to be the best strategy to generate income and make a living (FAO, 2014; Omiti *et al.*, 2018; Pingali & Rosegrant, 1995; Timmer, 1997; von Braun, 1995; World Bank, 2008). Over time, relying solely on small-scale farming has proven to be an unreliable approach to achieving sustainable food security and improving rural livelihoods (Fabricius *et al.*, 2023). One of the economic benefits of commercialisation is that it results in specialisation and eventually leads to a better comparative advantage, increased productivity, innovation, and efficiency (Diao *et al.*, 2020).

The commercialisation of small-scale farming generally results in a greater volume of goods being produced and distributed on a national scale, as well as increased specialisation at the regional and farm level (Kurosaki, 2003). Furthermore, commercialisation serves as a connecting force between the input and output sides of the economy, fostering a dynamic interplay that enhances resource allocation, stimulates demand, and ultimately drives economic growth through increased production and consumption.

The commercialisation of primary agriculture involves three distinct stages: (i) subsistence, (ii) semi-commercial and (iii) well-commercialised enterprise. The primary goal in subsistence agriculture is to produce crops or livestock for home consumption. Households grow food in small plots to meet their family needs and produce no surplus. Commercial farming, on the other hand, involves producing crops or livestock for sale. Commercial farmers aim to maximise profits and

increase production. This type of farming relies heavily on improved technology and the extensive use of fertiliser, pesticides, and machinery. Semi-commercial farming combines elements of both subsistence and commercial agriculture. Here, farmers aim to produce food for both home consumption and profit (Pingali & Rosegrant, 1995).

In recent years, African countries have been transitioning their small-scale poultry production systems towards a semi-commercial model. This strategic shift has demonstrated potential for enhancing income stability for rural households, improving overall agricultural productivity, and bolstering food security within the rural areas (Frequin *et al.*, 2009). The successful integration of indigenous chicken farming with commercial practices has yielded positive outcomes in countries such as Ethiopia, Kenya, Tanzania, and other African nations (Muchadeyi *et al.*, 2011). A study conducted by Hoffmann (2012) suggests that the success of the above countries is attributed to strong government support, effective policies, and private investment.

In line with other African countries, the South African government has demonstrated its commitment to supporting indigenous chicken farmers by introducing various funding schemes and policy frameworks. Programmes such as the Comprehensive Agricultural Support Programme (CASP), Ilima/Letsema, and the AgriBEE Fund aimed to assist smallholder poultry farmers with financial resources, infrastructure, and extension services (DAFF, 2010; NDA, 2018). However, despite these interventions, their impact remains inconclusive, as many farmers continue to struggle with commercialisation (Aliber & Hall, 2012). Challenges such as poor implementation, lack of follow-up support, and administrative inefficiencies have contributed to the limited success of these initiatives. According to Aliber and Hall (2012), one of the major reasons for these failures is the absence of comprehensive research prior to programme implementation. As a result, many smallholder poultry farmers have lost confidence in transitioning to commercial farming due to the unreliable execution of policies and insufficient long-term support.

Conclusively, the demand for indigenous chicken meat in South Africa continues to grow significantly, yet small-scale farmers have been hesitant to expand production to meet this market opportunity, particularly in the wake of the COVID-19 pandemic. This trend aligns with findings from Siyaya and Masuku (2013) in Swaziland, highlighting a broader reluctance among

indigenous chicken farmers to transition to commercial-scale production, despite favourable market conditions. To unlock the full potential of this sector and address the growing demand, further research is imperative to identify and analyse the specific barriers hindering farmers' adoption of commercial practices in the post-pandemic landscape. Such research would not only inform targeted interventions but also contribute to the sustainable development of the indigenous poultry industry, benefiting both farmers and consumers.

2. LITERATURE REVIEW

2.1. Theoretical Literature

Theoretical studies have been instrumental in understanding the determinants of agricultural commercialisation, particularly in smallholder poultry farming. The commercialisation process is shaped by both internal and external factors (Pingali & Rosegrant, 1995; von Braun *et al.*, 1991). External factors, including market access, credit availability, infrastructure, government policies, and regulatory frameworks, influence the farmer's ability to operate beyond subsistence levels (Omiti *et al.*, 2018; Pender *et al.*, 2006). Internal factors such as farm management practices, financial literacy, production scale, and household labour availability also play a critical role in determining commercialisation outcomes (FAO, 2014; World Bank, 2008).

The Theory of Agricultural Commercialisation (Pingali & Rosegrant, 1995) suggests that smallholder farmers gradually transition from subsistence farming to semi-commercial and full commercial farming as they improve their access to inputs, markets, and information. However, the Transaction Cost Theory (Coase, 1937) highlights that market participation depends on the ability to minimise costs associated with transportation, information asymmetry, and price fluctuations. Barrett (2008) argues that high transaction costs create entry barriers, discouraging smallholders from engaging in formal markets.

The New Institutional Economics (NIE) framework (North, 1990) further explains that weak institutions, poor infrastructure, and a lack of enforcement mechanisms can undermine smallholder commercialisation efforts. Empirical studies have supported these theoretical perspectives, demonstrating that successful commercialisation requires a holistic approach that integrates policy

support, financial access, and production efficiency (Dorward *et al.*, 2004; Leavy & Poulton, 2007). These theoretical insights provide a foundation for examining the specific determinants influencing indigenous chicken commercialisation in South Africa, particularly in a post-pandemic context.

2.2. Empirical Literature

Several empirical studies have explored the commercialisation of indigenous poultry farming across Africa, highlighting key determinants and challenges. Maumburudze *et al.* (2016) investigated poultry commercialisation in Zimbabwe and found that market accessibility, proper poultry housing, and water availability significantly influenced commercialisation. Similarly, Dutta (2012) examined small-scale poultry production in Nigeria, identifying production constraints, economic limitations, and marketing challenges as critical factors.

In Swaziland, Siyaya and Masuku (2013) found that commercialisation was largely driven by price fluctuations, the number of chickens sold, and domestic consumption preferences. In Uganda, Akidi *et al.* (2018) emphasise that commercialisation efforts were hindered by high feed costs, inadequate housing, vulnerability to predators, and frequent disease outbreaks. These findings align with Muchadeyi *et al.* (2011), who report that government interventions in Nigeria facilitated commercialisation by addressing input supply and infrastructure gaps.

Despite these findings, many of these studies predate the COVID-19 pandemic and do not capture its disruptions on supply chains, input costs, and market access. In South Africa, the government introduced initiatives such as the Comprehensive Agricultural Support Programme (CASP) and AgriBEE funding to assist smallholder poultry farmers (DAFF, 2010; NDA, 2018). However, Aliber and Hall (2012) argue that these programmes have yielded mixed results, with challenges related to poor implementation, lack of post-funding support, and inefficient extension services.

A significant research gap remains in understanding how the post-pandemic economic environment has shaped poultry commercialisation in South Africa. The rising costs of inputs, electricity shortages (loadshedding), and inconsistent market linkages necessitate a deeper investigation into the current barriers faced by smallholder poultry farmers. This study aims to fill

this gap by analysing the determinants influencing commercialisation and proposing targeted policy interventions.

3. RESEARCH METHODOLOGY

The study was conducted in Buffalo City Metropolitan Municipality, Eastern Cape Province, South Africa. The Buffalo City Metro municipality is renowned for its fertile soils and ideal grazing land, which are well-suited for livestock production. A recent report from the National Department of Agriculture indicates that Buffalo City Municipality is among the top five poultry producers in South Africa, making it an ideal location for this study.

The study employed a cross-sectional research design, allowing for the collection, evaluation, and interpretation of data at a single point in time (Creswell & Creswell, 2018). This design was selected due to its effectiveness in analysing relationships between variables and providing insights into commercialisation factors.

3.1. Sampling Approach

The study employed a stratified random sampling technique to ensure a representative selection of indigenous chicken farmers across the municipality. The strata were defined based on farm size, income levels, and geographical location to capture the diversity in farming conditions and market access. A total of 23 strata were formed using the demographic profiling of residents from a list of registered poultry farmers obtained from the Department of Agriculture. Within each stratum, random sampling was used to select participants, resulting in a total sample size of 150 farmers. This approach ensured that the study accounted for variations in production scale, market participation, and commercialisation constraints.

3.2. Data Collection

A permit letter was obtained from the municipal councillor and traditional leaders to facilitate the collection of primary data. Data were collected using a semi-structured questionnaire, which allowed for flexibility in exploring farmers' experiences and commercialisation challenges (Babbie, 2010; Creswell, 2009).

To minimise interviewer bias, enumerators underwent training on standardised interview protocols, ethical considerations, and techniques to reduce response distortion. Additionally, a pilot test of the questionnaire was conducted with 10 farmers, allowing for adjustments to enhance clarity and improve the effectiveness of the questions. The questionnaire covered aspects such as farmers' socioeconomic characteristics, production practices, market access, and commercialisation constraints.

3.3. Analytical Method

The Household Commercialisation Index (HCI) was used to assess the level of commercialisation among smallholder farmers, calculated as follows:

$$HCI = \frac{\text{Gross Value of sale}_{ij}}{\text{Gross value of production}_{ij}} \times 100 \dots \dots \dots (1)$$

This measure reflects the proportion of total production sold in the market, aligning with previous research on smallholder commercialisation (Okezie *et al.*, 2012; Randolph, 1992; Rao *et al.*, 2015). The HCI was chosen over alternative measures, such as market participation ratios, because it provides a clearer indication of commercialisation intensity rather than mere market engagement. The Gross Values in this study were determined by calculating the total revenue generated from the sale of indigenous chickens. This was computed as follows:

$$\text{Gross Value} = \sum (\text{Quantity of chickens sold} \times \text{Selling price per chicken}) \dots \dots \dots (2)$$

where:

The Quantity of Chickens Sold represents the total number of indigenous chickens sold by each farmer during the study period, and the Selling Price per Chicken refers to the average market price received by farmers at the time of sale.

This method aligns with prior research on agricultural commercialisation (Okezie *et al.*, 2012; von Braun *et al.*, 1995) and provides a reliable measure of commercialisation intensity. Additionally, variations in market conditions, seasonal price fluctuations, and informal sales were considered to ensure accuracy in Gross Value estimations.

Furthermore, a multiple regression model was employed to identify key determinants of commercialisation. The model, based on Gujarati and Porter (2009), is expressed as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \dots \dots \beta_n X_n + \mu_i \dots \dots \dots (3)$$

Where:

Y represents the degree of commercialisation, measured using the HCI. The independent variables (x) included in the model are gender, age, household size, educational level, access to extension services, farm size, distance to markets, access to electricity, feed price, loadshedding, COVID-19 pandemic effects, market access, and income level.

β_0 = Intercept or constant term; $\beta_1, \beta_2, \dots \beta_n$ = Slope or regression coefficient; $X_1, X_2, \dots X_n$ = Independent variables and μ_i = Error term.

3.4. Diagnostic Tests

To ensure the validity and reliability of the regression model, several diagnostic tests were conducted. Multicollinearity was assessed using the Variance Inflation Factor (VIF), where independent variables with a VIF greater than 10 were considered problematic and re-evaluated to mitigate potential issues of multicollinearity. Heteroscedasticity was tested using the Breusch-Pagan test, which helped determine whether the variance of the residuals was constant across observations, ensuring homoscedasticity in variance. Additionally, omitted variable bias was checked using the Ramsey RESET test, which confirmed whether all relevant factors were included in the model, preventing specification errors that could distort the findings. These tests strengthened the robustness and reliability of the regression analysis, ensuring that the model met key econometric assumptions.

4. RESULTS OF THE STUDY

4.1. Socioeconomic Characteristics

This section describes the key socioeconomic characteristics of research participants and explains the status of commercialisation amongst farmers in the study area. The study's results reveal a gender disparity in the sampled population, with 62% of the farmers being male and 38% being

female. This finding aligns with Monde (2003), who emphasises the role of men in household decision-making processes, and Randela (2005), who suggests that male dominance in household financial decisions contributes to their prevalence in commercial small-scale chicken production. The age distribution of participants indicates that adults dominate small-scale chicken production in Buffalo City Municipality. Approximately 57% of respondents fell within the 36-50 age range, compared to 10% and 15% for those below 35 and above 51 years old, respectively.

To ensure that participants provide honest responses regarding their level of income, respondents were offered a predefined income category (see Table 1). A significant finding of the study was that 95% of participants reported an income between R0 and R5,000 per month. This limited financial capacity presented a major hurdle for these farmers in achieving commercialisation. With a primary focus on meeting basic household needs, such as food, securing the resources necessary to meet commercial production standards becomes highly challenging.

Furthermore, the study revealed a significant disparity in market access, with only 25% of respondents having the ability to sell their products directly to formal markets. This limitation highlights the need for enhanced market linkages for these farmers (Mupenzi *et al.*, 2022). The researcher also observed a correlation between market access and participation in government initiatives. Farmers who were funded through government projects were more likely to sell their chickens to the market compared to non-participants. This highlights the potential benefits of such programmes in fostering commercialisation. Additionally, more than 50% of the respondents reported a lack of extension services in the region.

TABLE 1: Demographic Characteristics of Survey Respondents (N = 150)

Variables		Coding	Frequency (n)	Percent (%)
Gender	Male	0	57	38
	Female	1	93	62
Age	18- 35	0	8	10
	36-50	1	43	35
	51-79	2	23	15

	> 80	3	23	15
Household size	1-3 members	0	45	20
	4-6 members	1	75	50
	7-9 members	2	30	20
	> 10	4	0	10
Level of education	No formal education	0	30	15
	Primary	1	60	30
	Secondary	2	45	45
	Tertiary	3	15	10
Farm size	0.5-1.4	0	75	50
	1.5-2.4	1	45	30
	2.5-3.4	2	15	10
	>3.5	3	15	10
Level of income	R0-R1000	0	38	25
	R1001-R3000	1	75	50
	R30001-5000	2	30	20
	> 5000	3	8	5
Access to market	Yes	0	128	25
	No	1	23	85
Access to extension	Yes	0	75	50
	No	1	75	50
Access to electricity	Yes	0	113	75
	No	1	38	25

4.2. Commercialisation Level of Small-Scale Chicken Farmers

In line with previous research (Alemu *et al.*, 2006; Barrett, 2008; Pingali, 1997), this study employed the HCI to quantify the degree of commercialisation among small-scale chicken farmers in Buffalo City Metropolitan Municipality. The HCI considered both total chicken production and

total chicken sales. According to Jaleta *et al.* (2009), the scale of commercialisation is defined as follows: 0 to 30% indicates subsistence-oriented farmers, 31 to 65% indicates semi-commercialised farmers, and 66 to 100% indicates fully commercialised farmers. The results of this study were based on the following scale:

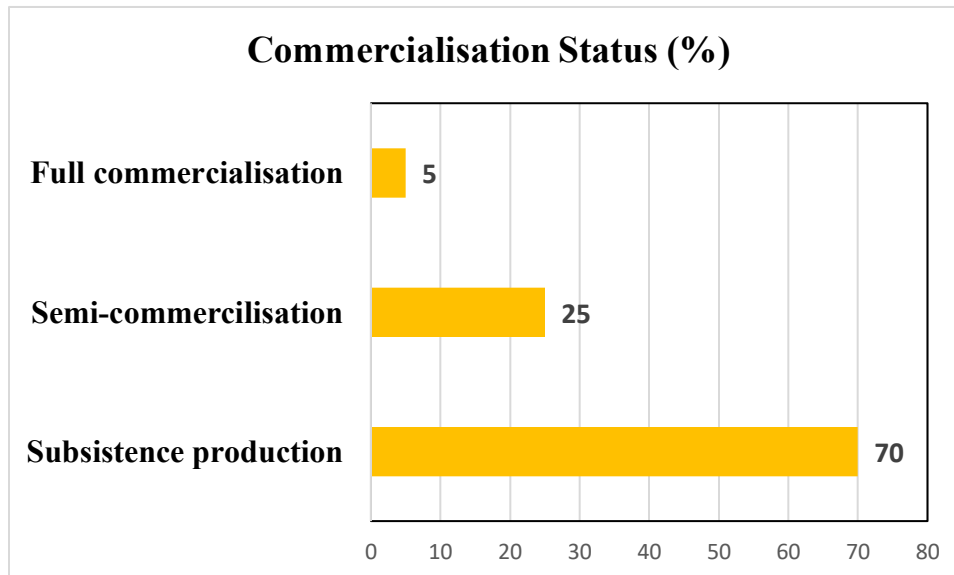


FIGURE 1: Farmers' Level of Commercialisation

The results depicted in Figure 1 reveal that a significant portion (70%) of the study participants were involved in subsistence production, meaning they kept indigenous chickens primarily for household consumption. Only a small percentage (5%) focused solely on producing chickens for making a profit (full commercialisation). The remaining farmers (25%) exhibited a “semi-commercialisation” approach, raising chickens for both home consumption and the market. The findings presented in Figure 1 suggest that a significant challenge for small-scale chicken farmers in Buffalo City is the limited access to markets. These results underscore the need for further research to identify and analyse the key factors that would enable these farmers to transition from subsistence to commercial production. The following section presents the results of a multiple regression model, highlighting the major determinants of commercialisations amongst indigenous chicken farmers.

4.3. Factors Influencing the Commercialisation

To analyse the factors influencing the degree of commercialisation achieved by small-scale chicken farmers, this study employed a multiple regression model (Minten *et al.*, 2023). This model analyses the relationships between several independent variables and the different categories of a commercialisation outcome (subsistence production, semi-commercial, and full commercialisation) (McCullagh & Nelder, 1989). The independent variables included in the model are factors such as age, gender, household size, income level, transportation costs, distance to markets, access to production machinery, access to electricity, farm experience, level of income, loadshedding, post-pandemic effects, and grading and standard requirements. The results of the model are summarised in Table 2 below.

TABLE 2: Multiple Regression Analysis Result of Factors Influencing Commercialisation

Variables	Notations	Marginal effect	Standard error	t-value
Gender	X ₁	0.0209	0.0115	0.95
Age	X ₂	0.3592*	0.1958	1.83
Household size	X ₃	0.0367***	0.2437	-0.81
Educational level	X ₄	0.0442***	0.2017	-1.27
Access to extension	X ₅	0.1036***	0.0293	3.54
Level of income	X ₆	0.0218	0.2127	0.10
Distance to markets	X ₇	-0.054	0.0586	-0.92
Access to electricity	X ₈	0.0109***	0.0053	2.08
Feed price	X ₉	-0.0356***	0.0197	3.32
Loadshedding	X ₁₀	-0.0123***	0.0084	2.66
COVID-19	X ₁₁	0.0127***	0.1455	0.50
Access to markets	X ₁₂	0.0412***	0.1733	1.69
Log likelihood		-67.5600		
Pseudo R ²		0.7944		
Chi-square		15.34		

***, **, * Significant at 1%, 5% and 10% respectively

Table 2 shows a log likelihood of -67.56 and a chi-square of 15.34, which are both significant ($p < 0.01$) and Pseudo R² (0.79), implying that the model has a good fit to the data. The results of the model also reveal that variables such as gender, household size, level of education, loadshedding, distance to markets, transport cost, feed cost, extension services, and the post-pandemic effect were statistically significant at the 5% confidence level. The following section presents a rigorous statistical examination of the individual variables significantly impacting commercialisation.

Gender: The model's results revealed a significant association ($p < 0.020$) between gender and the commercialisation level, with a positive coefficient for gender. This finding aligns with Quisumbing *et al.* (2014), suggesting that male household heads are most likely to engage in market-oriented small-scale chicken production. Other possible explanations for this gender gap could include traditional gender roles where males are expected to undertake more physically demanding farming tasks, potentially influencing a focus on raising chickens for market purposes.

The study found a statistically significant relationship ($p < 0.044$) between **educational status** and commercialisation level, but with a negative coefficient. This suggests that as a farmer's educational level increases, the likelihood of engaging in commercial chicken production might decrease. However, a negative coefficient does not necessarily imply a causal relationship. While some farmers with higher education may pursue more lucrative careers, as suggested by Amare *et al.* (2018), others may choose to venture into commercial farming.

The study revealed a significant positive relationship ($p < 0.037$) between **household size** and the level of commercialisation. This aligns with a study by Randela *et al.* (2008), suggesting that larger households with more members contribute to additional labour on the farm, potentially leading to increased production. This means that larger households have the potential to produce more output for commercial sale compared to smaller households.

Loadshedding: The results from the model indicate a statistically significant relationship at ($p < -0.012$) probability level, but with a negative sign. This suggests that loadshedding negatively impacts the commercialisation efforts of indigenous chicken farmers. This means that as

loadshedding increases, the level of commercialisation tends to decrease. A recent report by the World Bank (2024) also emphasises the link between access to electricity and increased productivity and commercialisation potential in the agricultural sectors of developing countries.

The analysis revealed a significant negative association ($p < -0.054$) between the **distance** travelled by farmers to the markets and the level of commercialisation. This implies that farmers located farther away from markets were less likely to sell their chickens commercially. This finding underscores the importance of accessible markets for facilitating commercialisation among small-scale chicken producers. A relevant study by Mupenzi *et al.* (2022) highlights the challenges faced by small-scale farmers in accessing profitable markets due to limited infrastructure and logistical constraints. Furthermore, **market access** clearly plays a very significant role in the commercialisation efforts of participants ($p = 0.041$). These findings align with a recent study by Jones *et al.* (2023), which investigated small-scale chicken production in developing countries and emphasised the critical role of market access in achieving commercialisation.

The results of the model confirm a significant inverse relationship ($p = -0.0356$) between **feed prices** and farmers' willingness to participate in commercial chicken practices. As feed prices increase, the level of commercialisation declines, indicating a detrimental impact on the industry. These findings align with those of Zondi *et al.* (2021), who also found a similar negative correlation between input costs and the commercialisation of indigenous crops among smallholder farmers in South Africa.

The study identified a significant positive association ($p < 0.02$) between **access to extension officers** and the level of commercialisation. This suggests that farmers who have access to extension services are more likely to engage in commercial chicken production. Extension officers play a crucial role in providing training and essential skills necessary to produce marketable chickens, potentially influencing farmers to shift their production towards the market. Brown and Miller (2023) acknowledge the importance of extension services in providing technical knowledge and support to small-scale poultry producers.

Lastly, the results of the model ($p = 0.0127$) confirmed that the **COVID-19 pandemic** significantly hindered the level of commercialisation amongst research participants. Notably, 25% of farmers involved in producing indigenous chickens for profit reported that disruptions, such as lockdowns, travel restrictions, and staff shortages, severely impacted their access to essential inputs and markets, aligning with findings from Bartik *et al.* (2020). Research participants reported post-pandemic recovery as a significant challenge, highlighting the financial strain imposed by escalating feed prices. This price increase has persisted in the post-pandemic period, squeezing farmers' profit margins and limiting their potential to continue rearing chickens commercially.

5. CONCLUSION AND RECOMMENDATIONS

This study's primary objective was to examine the key factors affecting the commercialisation of small-scale indigenous chicken farming in the post-COVID-19 pandemic era. The results highlight key constraints, including high transportation costs, long distances to markets, a lack of extension services, feed price volatility, and the impact of loadshedding, all of which hinder smallholder farmers from fully transitioning to commercial poultry production. Additionally, post-pandemic effects, including disruptions in transportation and logistics as well as increased input costs, continue to limit commercialisation efforts. These findings emphasise the need for targeted interventions that address structural barriers and support smallholder farmers in scaling up their operations.

Farmers who were struggling to commercialise reported a list of factors that hindered their transition to commercial practices, including high transportation costs, a lack of extension officers, long distances to markets, and expenses associated with transport and feed costs. Furthermore, these farmers lacked access to proper poultry processing equipment, hindering their ability to meet market quality standards and add value to their products. Power outages (loadshedding) presented an additional challenge, particularly for commercial producers who were unable to maintain adequate storage conditions for slaughtered chickens, resulting in product spoilage and reduced quality.

In addition, the study's results revealed that, post-pandemic, poultry farmers continued to face multiple socioeconomic dynamics that limited their success in commercialising their practices. Some of the key post-pandemic effects include farmers' inability to access markets due to ongoing disruptions in transportation and logistics. These disruptions negatively impact the farmers' ability to sell their chickens on time and profitably. Another prevailing challenge from the pandemic reported by farmers includes input shortages that have led to increased costs of essential farming inputs such as feed and fertiliser. The substantial increase in feed costs poses a significant challenge for small-scale poultry farmers aspiring to commercialise their operations. The prevailing feed prices create a considerable financial burden that hinders their ability to compete in the market and successfully commercialise.

Conclusively, the results of this study align with key economic theories of market participation, particularly transaction cost economics (TCE) and institutional barriers theory. According to TCE (Coase, 1937; Williamson, 1985), high transaction costs—such as high transportation costs, lack of market information, and institutional inefficiencies—can prevent smallholder farmers from fully commercialising. The study's findings confirm this, as factors such as market distance, transportation costs, and lack of extension services were significant deterrents to commercialisation. Moreover, institutional barriers, such as inconsistent government support, lack of formalised market structures, and regulatory constraints, align with the institutional theory perspective (North, 1990), which argues that weak institutions create uncertainties that hinder smallholder market participation. These theoretical insights reinforce the need for policy interventions aimed at reducing transaction costs and strengthening institutional support mechanisms to facilitate the commercialisation of indigenous chicken production.

To address these challenges, the government can play a pivotal role by providing centralised transportation services within specific areas, accessible to all small-scale chicken farmers residing in the study area. Successful case studies in other agricultural sectors support the recommendation for centralised transportation systems. For instance, in Kenya, the establishment of agricultural transport cooperatives has improved smallholder access to markets by reducing per-unit transport costs and enabling bulk transportation (Mugenda *et al.*, 2021). An extension office can oversee the

efficient allocation and operation of this transport system. This approach has proven successful in South Africa, as demonstrated by the Department of Rural Development in Limpopo's provision of shared tractors to rural maize farmers.

Furthermore, this study recommends integrating information communication technologies (ICT) into existing extension services to effectively disseminate indigenous chicken production knowledge, fostering adoption and ultimately boosting productivity and commercialisation. Establishing marketing platforms and networks is also crucial, as it enables farmers and traders to exchange information on stock levels and prices of indigenous chickens and their products. Additionally, training farmers on market-oriented production and effective price determination can empower them to thrive in the commercial landscape.

While this study provides valuable insights into the determinants of indigenous chicken commercialisation, future research should employ mixed-methods approaches to capture both quantitative trends and qualitative farmer experiences. A panel data analysis would be particularly beneficial in assessing commercialisation dynamics over time, identifying long-term policy impacts, and accounting for temporal variations in factors such as market access, government support, and input costs. Additionally, future studies could explore the role of digital platforms and e-commerce in facilitating commercialisation, given the increasing adoption of online agricultural marketplaces in developing economies.

6. FUNDING

This research received no external funding.

7. INSTITUTIONAL REVIEW BOARD STATEMENT

The study was conducted in accordance with the Declaration of Helsinki and was approved by the Institutional Review Board at the University of Fort Hare, with protocol code REC-270710-028-RA and a date of approval of 23 October 2023.

8. INFORMED CONSENT STATEMENT

Informed consent was obtained from all subjects involved in this study.

9. DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors on request.

10. CONFLICTS OF INTEREST

The author declares no conflict of interest.

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Variable description

Variable	Theoretical Description	Expected Outcome
Gender	Males are more likely to engage in commercial farming due to access to resources and decision-making power.	+
Age	Older farmers may have more experience but may also be risk-averse, affecting commercialisation decisions.	+/-
Household Size	Larger households provide more labour, enabling higher production and increased commercialisation.	+
Educational Level	Higher education levels improve business skills and access to market opportunities, though highly educated individuals may seek off-farm jobs.	+/-
Access to Extension Services	Access to extension services enhances knowledge, adoption of modern techniques, and market access, boosting commercialisation.	+
Farm Size	Larger farms allow for economies of scale, leading to higher commercialisation levels.	+
Distance to Markets	Longer distances increase transportation costs and limit market participation, discouraging commercialisation.	-
Access to Electricity	Access to electricity facilitates storage, processing, and marketing, supporting commercialisation.	+
Feed Price	High feed costs increase production expenses, reducing profitability and commercialisation incentives.	-
Loadshedding	Frequent power outages disrupt production, affecting farmers' ability to scale up operations.	-
COVID-19 Pandemic Effects	Pandemic effects, such as input shortages and market disruptions, negatively impact commercialisation efforts.	-
Market Access	Access to formal markets increases the likelihood of selling at competitive prices, enhancing commercialisation.	+
Income Level	Higher income levels enable investment in inputs, technology, and expansion, promoting commercialisation.	+

Source: Author's compilation