



InJAR

Indonesian Journal of Agricultural Research

Journal homepage: <https://injar.usu.ac.id>



Formal market access barriers in small-scale broiler farming at Kromhoek Village, Blourberg Local Municipality, Limpopo Province

Mahlatse Alfred Sekepe^{ID}, Abenet Belete^{ID}, Jenny Potsiso Mokhaukhau*^{ID}, Rudzani Nengovhela^{ID}

Department of Agricultural Economics and Animal Production, University of Limpopo, South Africa

*Corresponding author: jenmkha@gmail.com

ARTICLE INFO

Article history:

Received 23-01-2024

Revised 06-05-2025

Accepted 23-08-2025

Available online 23-11-2025

E-ISSN: 2615-5842

P-ISSN: 2622-7681

How to cite:

M. A. Sekepe, A. Belete, J. Mokhaukhau, and R. Nengovhela, "Formal market access barriers in small-scale broiler farming at Kromhoek Village, Blourberg Local Municipality, Limpopo Province: Formal market participation", *Indonesian J. Agric. Res.*, vol. 8, no. 3, pp. 119–127, Nov. 2025.

ABSTRACT

Poultry production is integral to the livelihoods of small-scale broiler chicken farmers in South Africa, serving as a potential source of income and food security. However, these farmers face challenges in accessing lucrative markets, limiting their economic potential. This study explored the factors influencing access to formal markets and analyzed the barriers hindering small-scale broiler farmers. A sample of 50 small-scale broiler farmers were interviewed, and a multivariate logistic model was used to analyze the data. The findings showed that trading on local and informal markets, the use of traditional production methods, limited marketing skills, the lack of extension services, and low revenue are barriers to formal market access for small-scale broiler farmers. In addition, the level of education, employment status, and distance to the market were the factors that hindered the market access of small-scale broiler farmers in the study area. Thus, easing market access barriers is key to tapping the economic potential of small-scale broiler chicken production and supporting sustainable growth in rural communities.

Keywords: broiler farmers, broiler production, formal market, market access



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<https://doi.org/10.32734/injar.v8i3.15491>

1. Introduction

Poultry production plays a pivotal role in the mixed crop-livestock farming systems of rural households in South Africa. Beyond providing meat and eggs for domestic consumption, it serves as a potential source of cash income through market exchanges. Access to formal markets for smallholder farmers is important for exploiting the potential of poultry chicken production to increase the incomes and economic scales of remote-based smallholder farmers. However, small-scale broiler chicken farmers in South Africa face significant challenges in accessing lucrative markets, hindering their ability to enhance their earnings and contribute to household income and food security [1].

Smallholder farmers have a low market participation rate in South African livestock markets, with an offtake rate of just about 5% [2]. Efforts, such as the adoption of the Marketing of Agricultural Products Act of 1996, have been made to help enhance the market participation of smallholder farmers by liberalizing the agricultural produce markets. Additionally, the Land Redistribution for Agricultural Development (LRAD) and the Custom Feeding Programs (CFPs), have the responsibility to assist these farmers to elevate and support the commercialization of their farm operations. However, with these efforts in place, smallholder farmers in the South African livestock value chain have a low rate of participation in the commercial markets [3].

Furthermore, the study of Nsakilwa [3] found that smallholder livestock marketing in a general context is hampered by a few elements, including a poor framework, low attractive yield numbers, an absence of market data, and possessing animals in an unhealthy habitat. Market access for small-scale farmers is a persistent issue in many developing countries. According to Kalauba [4], market access issues present both opportunities and challenges for rural small-scale farmers. In South Africa, the agricultural landscape is marked by commercial farmers who actively engage in markets, while the smallholder sector, predominantly comprised of black farmers, struggles with market participation [4].

A study by Mashaphu [5] found that, accessing formal markets and a low degree of efficiency and output, which are confirmed by low farmgate prices as farmers in informal nearby markets, has been a test to numerous smallholder farmers. That is, low prices accepted by the small-scale broiler chicken farmers frequently and regularly lead to low income for the farmers in question. Otekunrin et al. [6] argued that markets are alluded as essentials for upgrading agriculture-based economic growth and increasing rural incomes in the medium term particularly for the rural poor farming households. It is apparent that subsistence or small-scale broiler meat production cannot develop rural income and economies of scale without market-arranged production systems. Furthermore, it was found that one of the principal barriers to promoting organizational financial performance in any industry is the lack of knowledge towards the factors affecting Financial performance. For continuous improvement to occur, it is necessary to have an audit on factors affecting the financial performance of an organization [7].

The transition from subsistence and barter systems to productive forms of exchange is impeded by various challenges faced by small-scale broiler farmers. These challenges include inadequate infrastructure, high transportation costs, lack of information, technical support, and low participation in agricultural cooperatives [4]. The government can invest in developing better rural infrastructures, such as roads and local markets, to reduce physical barriers to market participation[8]. According to Segage et al. [9], the incapability of smallholder farmers to produce high-quality and quantity of broiler chickens hinders their willingness to participate in markets. Smallholder broiler farmers depend on the production of agricultural commodities for sustainable livelihood even though agricultural policies and market conditions are not making it easy. However, it was found that as production rate is an important factor for the access to formal commercial markets, to boost profitability, along with quantities and quality, farmers can opt to subject their stock to drugs and additives, as they boost growth and the investment return [10].

Most smallholder farmers are situated in far remote areas with poor transport facilities and market infrastructure, to mention a few, and every one of these adds to the high transaction costs they are facing. Transaction costs have been noted to be the vital causes behind smallholder farmers' inability to get access to the formal markets. These transaction costs incorporate expenses of looking for trading partners, bargaining and marketing costs, monitoring and maintenance, authorization, and lastly, moving the item to its objective destination [11].

Efforts should be directed towards addressing the exclusion of small-scale broiler chicken farmers from lucrative market channels. While these farmers often consume a significant portion of their produce locally, they face barriers in accessing formal markets such as direct sales to supermarkets and exports. Factors contributing to this exclusion include a lack of management skills, low production volumes, poor quality, inadequate storage facilities, and transportation constraints [12].

In accordance with a study by Mashapu [5], it is argued that small-scale farmers are being sabotaged and undermined in most African nations since they work in small areas of land, lacking investments and institutional backing. Furthermore, the study argued that, although monetary foundations have been laid out to help small-scale farmers, the disadvantaged broiler farmers, and general small-scale farmers are yet to confront the test of getting credit. As the demand for high-value agricultural products continues to grow, ensuring the inclusion of smallholders in these markets becomes imperative for their sustainable economic development.

The relative importance of broiler chicken in rural food systems suggests substantial opportunities for commercialization. Agricultural commercialization aims to shift from production solely for domestic consumption to production based on market orientation, and it is generally the degree of participation in the output markets with the focus very much on cash incomes [13]. Focusing on broiler production and promoting consumption could be a pathway to increase smallholder farmers' participation in the market, thereby

improving their incomes [14]. However, the changing dynamics in agricultural markets, characterized by high demand for high-value products and stringent quality requirements, pose challenges for small-scale producers to access these growing markets [4]. Additionally, small-scale broiler farmers are exploited by avaricious traders and receive low prices for their produce because of these factors [15]. Addressing market access barriers in small-scale broiler farming is crucial for the economic development of rural communities. Hence, the study seeks to identify the formal market barriers faced by small-scale broiler farmers and to analyze the factors hindering access to formal markets by these farmers.

2. Methods

2.1. Study area

The research methodology involved a detailed exploration of the study area, data collection methods, and analytical techniques to address the research objectives. The study was conducted in Kromhoek village which is in the Blouberg Local Municipality of the Limpopo Province. The village is characterized by a population of 4255 with an area of 3.47 km² [16]. The village encompasses various agricultural activities such as livestock rearing and fruit and vegetable production for both commercial, subsistence and small-scale purposes [17].

2.2. Data collection and analytical models

Data collection from small-holder broiler chicken farmers employed a semi-structured questionnaire, utilizing purposive sampling to obtain a sample size of 50 respondents. The reason for using a purposive sampling procedure was because it allows the researchers to deeply explore a specific phenomenon, ensuring that the participants selected, provide the most relevant and meaningful data. Descriptive statistics were employed to identify and analyze the socio-economic characteristics of broiler farmers, providing a comprehensive summary of the dataset, where percentages were applied for categorical variables, while minimum, maximum, and mean values were used for continuous variables. Pearson's correlation test was utilized to test the relationship between socio-economic factors and access to formal markets. This statistical method assessed the strength and direction of linear relationships between variables.

In analyzing factors hindering access to formal markets, a multivariate logistic regression (MLR) model was employed. The model contains more than one independent variable, which assists in understanding the relationship between these variables and their impact on the dependent variable. Therefore, the MLR model's specification in this study included parameters such as education (EDU), gender (GND), infrastructure (INF), income (INC), employment (EMP), distance to markets (DDM), agricultural extension services (AES), farm type (TYP), age (AGE), biosecurity measures (BFE), agricultural practices (AGF), household size (HHZ), and an error term (e). The multivariate logistic regression model was specifically formulated as:

$$\log \frac{\pi_i}{1-\pi_i} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots \beta_n X_n + u_i \quad (1)$$

Where $\pi(x) = P(X = x)$ is the independent variable Y with two categories, which take the form 0 and 1, where 0 represents no participation in the formal market and 1 represents the farmer who does participate in formal markets. X_1, X_2, X_3 are the predictor variables in the multivariable model.

$$Y_{ATM} = \beta_0 + \beta_1 EDU + \beta_2 GDN + \beta_3 INF + \beta_4 INC + \beta_5 EMP + \beta_6 DDM + \beta_7 AES + \beta_8 TYP + \beta_9 AGE + \beta_{10} BFE + \beta_{11} AGF + \beta_{12} HHZ + e \quad (2)$$

Table 1. Description of variables for the binary logistic regression model

Variables		Description	Unit of measurement
Dependent Variable			
	Variables	Description	Unit of measurement
Y1	ATM	Access to markets 1 if participant has access to markets, 0 if participant does not have access to markets	Dummy

Table 1. Continued

Variables		Description	Unit of measurement	
Independent variable				
X1	EDU	Education level	0 if the respondent has no formal education; 1 for primary education, 2 for secondary education, and 3 for tertiary education	Categorical
X2	GND	Gender	1 if the respondent is female, 0 if the respondent is male	Dummy
X3	INF	Accessibility of agricultural markets information	1 if the respondent has access to agricultural information, 0 if the respondent has no access to agricultural market information	Dummy
X4	INC	Income	0 if the farmer earns less than R35000, 1 if farmer earns between R35001 and R70000, 2 if farmer earns between R70001 and R100000, 3 if farmer earns more than R100000	Dummy
X5	EMP	Employment status	0 if the respondent is unemployed, 1 if the respondent is self-employed, and 2 if the respondent is employed.	Categorical
X6	DDM	Distance to the day-old chick's market	Distance in kilometers	Numeric
X7	AES	Access to extension services.	1 if the respondent has access to extension services, 0 if the respondent does not have access to extension services	Dummy
X8	TYP	Type of production system	1 if the respondent has used modern broiler production systems, 0 if the respondent uses traditional broiler production systems	Dummy
X9	AGE	Age	Age of the farmer	Years
X10	BFE	Broiler Farming experience	Number of years the farmer has been producing broiler chickens	Years
X11	AGF	Agricultural financing	0 if the respondent has no access to agricultural finance, and 1 if the respondent has access to agricultural finance	Dummy
X12	HHZ	Household size	Number of household members	Numeric

3. Results and Discussion

Table 2 shows the descriptive statistics results of the variables used in the study. From the results, it can be observed that the youngest farmer was aged 22 years, and the oldest was 63 years old, the average age was 37 years. Furthermore, the least broiler farming experience was 1 year, and the maximum was 14 years, the mean

was 6 years. Lastly, concerning the distance to the day-old chicks' market, the minimum distance to the markets was 70 km, and the maximum was 200 km. This suggests that the farmers travel long distances to formal markets. The minimum household size was 1, the maximum was 10 and the average household size was six people in a household.

Table 2. Description of continuous variables

Variables	N	Minimum	Maximum	Mean	Standard deviation
Age of the farmer	50	22	63	36.86	11.22
Broiler farming experience	50	1	14	5.84	3.401
Distance to day-old chick's market	50	70	200	132.42	39.758
Household size	50	1	10	5.14	2.339

Table 3 reveals a gender disparity in broiler chicken farming, with 54% of farmers being male and 46% female. This indicates a prevalent trend where males actively engage in agricultural activities more than their female counterparts. The observed male dominance may stem from societal perceptions associating agricultural work, especially marketing, with traditionally "manly" or field-intensive tasks. Consequently, male farmers are likely to have a higher probability of accessing formal markets compared to their female counterparts. The results showed that most of the broiler farmers in the study area do not have access to formal markets (70%). The study highlighted that 22% of farmers lack formal education, potentially concentrated among older individuals who may have faced historical disadvantages, whether financial or otherwise. Only 4% of farmers possessed primary education, while 34% had a secondary education. Notably, 40% of respondents hold tertiary education qualifications, indicating a diverse educational background among broiler farmers.

Table 3. Socio-economic characteristics of small-scale broiler chicken farmers in Kromhoek Village

Variables	Percentage (%)
Gender of the farmer	
Male	54
Female	46
Participation in the formal market	
No	70
Yes	30
Level of education	
No education	22
Primary education	4
Secondary education	34
Tertiary education	40
Access to agricultural finance	
Yes	28
No	72
Type of broiler production methods	
Modern methods	26
Traditional methods	74

Table 3. Continued

Variables	Percentage (%)
Access to agricultural market information	
Yes	36
No	64
Access to extension services	
Yes	42
No	58
Profit from broiler production	
Less than R3500 per month	84
Between R3500 -R7000 per month	16
More than R7000 per month	0
Employment status	
Unemployed	48
Self-employed	22
Employed	30

3.1. Perception of barriers to formal markets by small-scale broiler farmers

The perception of barriers to formal markets by small-scale broiler farmers is presented in Table 4. The survey results reflect the perception of respondents on various aspects related to broiler farming, presented on a five-point Likert scale. Most participants strongly agreed (46%) and agreed (50%) that trading exclusively on local and informal markets is a sustainable and sufficient practice. In contrast, a significant proportion (40%) disagreed, suggesting a divergence of opinions on the viability of this approach. Regarding the use of traditional systems, the majority (42%) agreed, while 32% held a neutral stance, indicating a mixed sentiment about the adoption of traditional farming methods. Commercialization received favorable responses, with 46% strongly agreeing and 44% agreeing that it is a viable strategy. Extension services are perceived positively, with 42% strongly agreeing and 38% agreeing on their importance. Notably, respondents expressed concerns about low income/revenue, as 46% strongly agree and 42% agree on this matter. Lastly, the majority (52%) believed in the significance of marketing skills, while a smaller percentage expressed disagreement, emphasizing the perceived importance of such skills in broiler farming. These nuanced responses underscore the complexity and diverse perspectives within the broiler farming community.

Table 4. Perception of barriers to formal markets by small-scale broiler farmers

Perception	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Scale of farming	46	50	4	0	0
Trading only on local and informal markets is sustainable and enough	16	6	18	40	20
Use of traditional systems	32	42	22	2	2
Commercialization	46	44	10	0	0
Extension services	42	38	20	0	0
Low income/revenue	46	42	12	0	0
Marketing skills	52	42	4	2	0

The analysis was obtained using the Statistical Package for the Social Sciences (SPSS). From the 12 independent variables that were logged during the analysis, seven were found to be significant. The model summary showed that a Nagelkerke R-squared of 77.30% was obtained, which explains that 77.30% of the variation in the dependent variable (ATM) is explained by the independent variables. Additionally, the model yielded a -2log likelihood of 32.33. Below is the influence of significant variables on the farmers' access to formal markets.

Education level produced a negative relationship with a slope of (-1.142), at a significance level of 10%. This implies that uneducated farmers have the likelihood of having access to the formal markets, however illiterate, and the inability to receive and/or process valuable information that may be related to barriers to accessing formal markets. This study contradicts the findings of Tarekegn and Yosefe [18], who argued that the relationship between education level and access to poultry markets is positive, stating that the higher the grade or level of education, the higher the odds of deciding to participate in poultry formal markets.

Table 5. Factors hindering access to formal markets by small-scale broiler chicken farmers

Variable	B	Standard error	Wald	Significance
Age of the farmer	-.047	.072	.425	.515
Gender of the farmer	.981	1.097	.800	.371
Education level	-1.142	.673	2.88	.090***
Household size	.507	.297	2.908	.088***
Employment status	-2.244	1.062	4.462	.035**
Broiler Farming experience	.041	.261	.024	.876
Accessibility of agricultural markets information	2.815	1.391	4.096	.043**
Farm Income	5.785	2.206	6.878	.009*
Type of production system	3.538	1.752	4.079	.043**
Agricultural financing	.024	1.220	.000	.985
Distance to the day-old chick's market	-.038	.020	3.552	.059**
Access to extension services	-.724	1.067	.460	.497
Cox and Snell R-squared	.546			
Nagelkerke R-squared	.773			
-2log likelihood	32.330			

Note: *significance at 10%, **significance at 5% and ***significance at 1%

Employment status has a negative relationship with a slope of (-2.244), at a significance level of 10%. This implies that these farmers (employed) are more likely to have access to formal markets, however, the likelihood of them not accessing these markets may be because employment consumes and requires the time of farmers, to a point where they may put very little work into generating less efficiency that can yield competitive outputs for formal markets trading.

The analysis revealed a positive relationship (2.815) between access to agricultural broiler chicken market information and formal market accessibility at a significance level of 5%. This suggests that accessing information on agricultural markets facilitates entry into formal markets, providing essential guidelines and frameworks. This finding aligns with Mdletshe and Obi's [19] study, which identified that a lack of information on formal broiler markets constrains smallholder farmers, necessitating an exploration of alternative marketing channels. Addressing technical, social, and economic constraints is essential for the optimal utilization of any market channel by smallholder farmers, emphasizing the need for comprehensive policy initiatives to enhance their market participation.

The study established a positive relationship (5.785) between farm income and the likelihood of accessing formal markets at a significance level of 1%. This concurs with Mdletshe and Obi's [19] findings, indicating that increased income among smallholder farmers enhances productivity, job creation, and local economic development. Adequate income emerged as a critical driver of growth across various business scopes,

facilitating the adoption of improved machinery and technology. The study highlighted the economic implications underscored by the disparity between high-income farmers with good resources to participate in the formal markets more than the low-income smallholder farmers. Because of this, the government should generate or accelerate policies aimed at financially supporting the small-holder farmers, i.e., subsidies and facilities that can assist in production, storing, transporting, etc. Furthermore, these policies should actively engage farmers to be informed about these markets, so as to increase their participation.

The study found a positive correlation (3.538) between the type of production systems employed by farmers and formal market access at a significance level of 5%. The coding of 0 for traditional methods and 1 for modern methods reveals that farmers employing modern inputs are more likely to access formal markets. This corroborates the findings of Baloyi [20], who asserts that the effectiveness of production inputs influences crop productivity, emphasizing the challenges faced by smallholder farmers with limited access to modern inputs due to credit constraints. Furthermore, a study by Singha found that the deviation from traditional methods often attracts non-cooperation or even social isolation, which can discourage innovation and experimentation. This resistance limits the potential for economic growth and market access [21]. This implies that a lack of on-farm infrastructure hinders market entry, as buyers emphasize product quality, thereby underscoring the significance of storage facilities. The positive relationship between access to formal markets and modern production systems implies that farmers with better modernized methods and tools have an upper hand in accessing the markets. These farmers are typically the high-income farmers who have the financial resources and support that afford these mid-tech and high-tech inputs. These inputs enhance production while reducing costs. Therefore, technology is a barrier to accessing markets for the low-income smallholder farmers who have less to no capital to finance these inputs.

Household size demonstrates a positive correlation (0.507) at a significance level of 10%, indicating that larger household sizes are more likely to access formal markets. Suggesting that greater collaboration among family members enhances market participation. Additionally, the study by Machethe and Mollel [22] supports this, highlighting that farmers with larger household sizes tend to prioritize family labor over external hires, thereby improving efficiency at lower costs. The positive relationship between access to formal markets and household size implies that more family members who engage in farming activities increase the odds of accessing the formal markets. Thus, this finding encourages the facilitation of cooperatives and/or partnerships to increase efficiency, diversity, and improve market access.

A negative relationship (-0.038) was identified between the distance to day-old chicks' suppliers and the likelihood of accessing formal markets at a significance level of 5%. This implies that increased distance to suppliers' markets reduces the probability of farmers accessing formal markets. The associated transport costs are compounded by poor road infrastructure, limited output levels, and transportation capacity to formal markets. This observation resonates with Baloyi's [20] findings, underscoring the challenges faced by smallholder farmers who lack adequate transport access for conveying their products to formal markets.

The findings of the study suggest that the null hypothesis, stating that there is no relationship between the socio-economic factors of small-scale broiler farmers and access to formal markets, was rejected. This is because the study proved that there is a relationship between socio-economic factors and access to formal markets. Additionally, the study showed that the null hypothesis, stating that there are no factors hindering access to formal markets by the small-scale broiler chicken farmers, was also rejected, as the study found factors such as education level, employment status, and distance to day-old chicks' market hinder access to formal markets.

4. Conclusion

This study identified the key barriers preventing small-scale broiler farmers in Kromhoek Village from accessing formal markets. The findings highlighted that factors as education level, employment status, and distance to the day-old chick market significantly hinder market access. The results indicate that limited financial resources, reliance on traditional production methods, and inadequate access to extension services further exacerbate the challenges faced by these farmers.

A critical observation was that higher farm incomes and the adoption of modern production techniques enhance the likelihood of accessing formal markets, reinforcing the need for economic and technological empowerment. Household size positively correlates with market access, suggesting that labor availability and

cooperation within farming households play a role in commercial success. Conversely, long distances to suppliers and markets increase costs and logistical constraints, reducing formal market participation. This aftermath effectively led to hypotheses being rejected. Addressing these challenges requires a holistic approach that integrates financial support, technical and marketing training, and improved infrastructure. Policymakers, agricultural stakeholders, and financial institutions must work collectively to facilitate access to markets, enhance farmers' productivity, and foster a more inclusive agricultural economy.

Future research should explore the role of government policies, agencies, and private-sector involvement in easing market access constraints for small-scale farmers. Additionally, studies focusing on digital solutions for market information dissemination, networking, e-commerce, education, and innovative marketing strategies could provide new pathways for smallholders to engage in formal markets. Furthermore, future research should focus on the implementation of policies that strongly encourage partnerships and cooperative structures among smallholder farmers.

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