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Research Article

Value Chain Analysis of Poultry Industry in Ethiopia: A Case Study of Hadiya Zone, Central Ethiopia

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ABSTRACT

Introduction: The poultry industry is a critical sub-sector of agriculture and a key driver of economic growth in the Hadiya Zone of Central Ethiopia. Despite its potential, the sector faces significant challenges due to market competitiveness, limited access to inputs, and weak value chain coordination, which restrict the benefits for smallholder producers.

Objectives: This study aimed to assess the poultry value chain and analyze the factors influencing poultry farmers' decisions to participate in the market in Hadiya Zone, Central Ethiopia.

Methods: Primary data were collected from 297 poultry farmers, 25 traders, 8 processors, and 54 consumers, supported by relevant secondary sources. Descriptive statistics were used to map the value chain and identify constraints, while a binomial logistic regression model was employed to examine the determinants of farmers' market participation decisions.

Results: The analysis revealed that the poultry value chain involves multiple actors—input suppliers, producers, traders, processors, and consumers. Value chain activities include input supply, production, marketing, processing, and final consumption. Producers were found to receive relatively low returns compared to traders and processors, who dominate the chain due to higher capital and bargaining power. Major constraints identified include feed shortages, low productivity, limited access to improved breeds, veterinary services, and weak extension support. Market participation was significantly influenced by education level, distance to market, household size, presence of children, flock size, breed type, alternative income sources, access to veterinary services, and availability of supplementary feed.

Conclusions: Strengthening poultry farmers' market participation requires a multi-pronged policy approach. Interventions should focus on enhancing education, improving access to inputs and veterinary services, investing in infrastructure, and supporting diversified income sources to make the poultry value chain more inclusive and profitable for smallholders in the Hadiya Zone.

Keywords: Poultry value chain, market participation, logistic regression, Hadiya Zone

1. INTRODUCTION

The surge in the global demand for food obtained from animals is fuelled by an increase in income, population, and urbanization, predominantly in developing countries. The poultry industry has shown the most considerable growth among all livestock industries. The Food and Agriculture Organization (FAO, 2023) predicts that developing countries will experience an increase in poultry meat consumption by more than 16 million metric tons in the period spanning from 2015 to 2024, bringing the total consumption to over 84 million. Currently, poultry products constitute over 35% of the total consumption of animal protein in the world. This momentum is not expected to slow down any time soon, as the OECD-FAO Agricultural Outlook (2024) has also forecasted increased consumption due to the low cost, swift production cycles, and improved genetics and feed efficiency. The outstanding and rapid

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biological ability and low capital requirements of poultry to convert feed into quality protein strengthen its position as a leading contributor to food security, nutrition security, and general global security.

In rural and low-income populations, the impact of poultry production goes beyond nutrition, as it serves socio-economic purposes as well. It provides supplemental income to smallholder farmers, especially women, and improves dietary diversity through the consumption of eggs and meat, which are consumed more (Tadelle et al., 2023; Akinola et al., 2022). Poultry farming in Ethiopia is highly promising owing to its cultural acceptability, strong adaptability to local conditions, and low resource and land requirements. Recent national policies such as the Livestock Master Plan and commercial poultry advancement initiatives recognize poultry farming's contribution towards rural poverty alleviation and nutrition (MoA, 2024; ILRI, 2023;).

As of 2023, Ethiopia boasts a poultry population of over 70 million, most of which are kept in traditional backyard systems (CSA, 2023). The rapid expansion of commercial chicken farms, particularly in Addis Ababa and other cities, has not met the country's overall poultry production needs (ILRI, 2023). The majority of poultry producers in Ethiopia are smallholder farmers who rear indigenous chickens with low productivity, primarily due to limited access to quality feed, veterinary services, improved housing, and other essential infrastructure (FAO, 2021; CSA, 2020; Dessie et al., 2013).

While the poultry sector has focused on feeding and breeding at the technical level, such efforts alone have not produced desired changes. There is greater understanding now that improving access to markets as well as enhancing integration into the value chain do offer growth opportunities for development, in this case poultry production, in rural areas (Mensah-Bonsu et.al. 2019; Hailemariam and Zemedu, 2018;). The value chain analysis enables one to study the entire life cycle of products starting with production until consumption, determine important stakeholders from all levels, evaluate the institutional relations, and determine elements that restrict productivity and competitiveness. Additionally, the market determines the success of smallholder poultry producers to a great extent. Access to markets should also consider proximity to markets, their design and operations, as well as the extent to which producers can participate constructively. Farmers with unsupportive market structures and value chains are left with little incentive and financial security to invest in increasing production. This is the scenario that makes the poultry industry in Hadiya Zone both a challenge and an opportunity.

This study, therefore, seeks to evaluate the value chain of the poultry industry in the Hadiya Zone. It wishes to determine the reasons that smallholder farmers do or do not participate in poultry markets, analyze the value chain dynamics, and examine the impact of different market outlet choices on producers' access and income. In so doing, the study intends to fill an important gap in the existing body of knowledge and inform policy designed to improve the competitive and sustainable capacity of the poultry industry in the region. Within these boundaries, the Hadiya Zone is particularly distinguished as a region that could greatly benefit from expanded poultry production, processing, and consumption. Poultry serves as a principal source of income for both urban and rural households in the region. Nevertheless, access to market opportunities continues to pose difficulties for many farmers seeking to expand flock sizes and adopt a more commercially driven approach (Hadiya Zone Agriculture Office, 2024).

Farmers in the Hadiya Zone face significant inconsistencies in market participation or product supply as a result of inconsistent access to inputs, information, and infrastructure. Having taken into consideration the lower levels of capital, land, and labor compared to other livestock, poultry farming proves to be helpful for smallholder farmers. There is an important gap in systematically analyzing the interrelation of market access along the value chain to truly understand and address these constraints. This study is meant to bridge the gap by evaluating the surveyed area's poultry value chain development in the Hadiya Zone, specifically focusing on smallholder market participation, key participation barriers, and assessing the market actors involved. Actionable conclusions are anticipated to be provided due to the accessibility and inclusiveness of the poultry sector.

2. OBJECTIVES

2.1.General Objective

The general objective of this study is value chain analysis of poultry industry in Ethiopia: A case study of Hadiya Zone, Central Ethiopia

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Objectives: This study aimed to assess the poultry value chain and analyze the factors influencing poultry farmers' decisions to participate in the market in Hadiya Zone, Central Ethiopia.

2.2. Specific Objectives

i. To assess the poultry value chain sytem actors in the study area
ii. To analyze the factors influencing poultry farmers' decisions to participate in the market in the study area

3. METHODS

3.1. Description of the Study Area

The research was conducted in the Hadiya Zone, located in the Central Ethiopia Region. The zone lies approximately 232 kilometers south of Addis Ababa, the capital city of Ethiopia. Covering an estimated area of 346,958.5 hectares, Hadiya Zone is situated at an average elevation of 1,900 meters above sea level. It experiences a temperate climate, with daily temperature levels ranging between 18°C and 27°C. Rainfall is seasonal, with a wet period extending from February to August most of the time and drier months from September to January. As of the 2017 population projection of Ethiopia, Zone had a total population of approximately 1,710,812, composed of males 846,852 (49.5%) and females 863,960 (50.5%) (CSA, 2017). The population is known for its cultural diversity and peaceful coexistence across various ethnic and religious groups.

The local economy is largely based on mixed farming systems that include both crop cultivation and livestock rearing. Farmers produce a range of cereals (such as wheat, teff, maize, barley, and beans), vegetables, fruits, and cash crops like coffee and khat. The zone is particularly known for its high wheat productivity, with yields reaching approximately 65 quintals per hectare, earning it the nickname “the wheat basket” of Ethiopia. Livestock, especially dairy production, is also a significant component of household income and food security in the region (Hadiya Zone Agriculture Office, 2024). This study employed a comprehensive research methodology to analyse value chain dynamics within the poultry industry of Hadiya Zone. The methodology encompasses the study area description, sampling procedures, data sources, collection methods, and analytical techniques employed to meet the research objectives.

3.2. Study Population and Sampling Techniques

To examine the poultry value chain, a multi-stage sampling method integrating simple, stratified, and judgmental techniques was used. The first stage involved randomly selecting two districts and one town to represent the ten districts and three registered towns in Hadiya Zone. In the second stage, seven rural and one urban *kebeles* were randomly selected based on proportional representation. Respondents were stratified by their roles in the poultry value chain: farmers, wholesalers, collectors, retailers, and processors. A simplified formula by Cochran (1977) was used to determine the sample size, assuming a 95% confidence level and a 5% margin of error. From a population of 3977 actors (excluding consumers), a representative sample of 330 was proportionally drawn. An additional 54 consumers were selected judgmentally due to the infinite nature of the consumer population, culminating in 384 respondents. To show in detail.

$$n = \frac{z^2 pq}{e^2}$$

$$n = \frac{(1.96)^2 * 0.5 * 0.5}{(0.05)^2} = 384$$

After deduction of 54 consumers since it is judgmental, the remaining 330 will be proportionally allocated for poultry value chain actors other than consumers by using the formula

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$n_i = \frac{nN_i}{N}$ as following:

$$Poultry\ farmers\ (n_f) = \frac{330 * 3603}{3977} = 297$$

$$Collectors\ (n_c) = \frac{330 * 98}{3977} = 9$$

$$Wholesallers\ (n_{hs}) = \frac{330 * 21}{3977} = 2$$

$$Retaillers\ (n_r) = \frac{330 * 171}{3977} = 14$$

$$Processors\ or\ hotels\ and\ restaurants\ (n_p) = \frac{330 * 87}{3977} = 8$$

Where n represents sample size, N_i represents population size of the each poultry value chain actors and N represents the population size other than consumers. In this study, N = 3977; n= 330.

3.3. Data Sources and Collection Methods

This study employed both primary and secondary data collection methods to ensure comprehensive and reliable findings. The primary data was gathered directly from value chain actors, including poultry farmers, traders, processors, and consumers, using a combination of structured questionnaires, direct observations, and interviews. Additional qualitative insights were captured through focus group discussions and key informant interviews guided by pre-tested checklists. These tools were designed to obtain detailed information on household and farm characteristics, income sources, marketing and market access, processing, value addition, extension and credit services, consumption patterns, and gender-disaggregated roles along the poultry value chain.

In line with Creswell and Creswell (2018), the study recognizes the complementary nature of quantitative and qualitative methods. While structured questionnaires provided quantifiable data, qualitative approaches offered rich, contextual understanding of behaviours, perceptions, and attitudes that cannot be captured through numbers alone. Observation was also used to collect information on business size, location, and type. Secondary data was sourced from published books, journal articles, government reports, and records from relevant institutions. These sources helped triangulate the findings and provide a broader context. The entire data collection process was conducted under the close supervision of the researcher to ensure data accuracy and integrity.

3.4. Methods of Data Analysis

The data collected from poultry farmers, traders, processors, consumers, and other stakeholders were analysed using a combination of descriptive statistics, value chain analysis, and econometric modelling. Descriptive statistics, including means, percentages, standard deviations, and t-tests, were employed to summarize household characteristics, market access conditions, and poultry marketing practices. These tools also supported the analysis of marketing services and facilities across the value chain.

Value chain analysis was conducted to map the flow of poultry products and information among actors, identify the roles and relationships of participants, and assess how value is added at each stage from production to consumption. This involved analysing volumes produced, amounts consumed at home, and quantities sold, supported by both primary and secondary data sources.

For econometric analysis, a binary logistic regression model was applied to identify the determinants of market participation among poultry farmers. Since not all households with poultry were engaged in market transactions, this model was appropriate for handling the binary nature of the participation variable. Following Agresti (2007), the logistic regression was chosen for its ability to handle both categorical and continuous independent variables,

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ensuring practical and statistically robust findings. Econometric model specification of supply function in matrix notation is the following.

Logit (p) = $\ln(\frac{p}{1-p})$ = Bo + $\sum_{i=0}^{n} Bi * Xi$

The coefficients can be interpreted as the change in the log-odds associated with a one unit change in the corresponding independent variable, keeping the other variables constant or the odds increase multiplicatively by e^{β} for every one unit change in X.

The probability of success is expressed as follows:

$P_i = p(Y_i = 1/X_{1i}, X_{2i}, \ldots\ldots\ldots X_{ki}) = \frac{e^x B}{1+e^x B}$ and odds of success is as given as follows

Odds (Yi = 1) = $\frac{pi}{1-pi} * e^x B$

It is important to check for multi-collinearity and heteroscedasticity (by using the Breusch-Pagan test) problems before running the model. Multi-collinearity problem arises due to a linear relationship among explanatory variables, and it becomes difficult to identify the separate effect of independent variables on the dependent variable because there exists a strong relationship among them (Gujarati, 2003). The variance inflation factors (VIF) technique was employed to detect multi-collinearity in continuous explanatory variables, and the contingency coefficient was also employed for discrete variables. According to Gujarati (2003), VIF (Xj) can be defined as:

VIF = $\frac{1}{1-R_j^2}$ and of contingency coefficient (CC) = $\sqrt{\frac{X^2}{x^2 n}}$

4. RESULTS

4.1. Descriptive Statistics

Demographic characteristics Poultry Farmers: Sampled farmers ranged from 18–65 years old, with an average age of 41 years. Most (71.3%) were male-headed households, aligning with findings from CSA (2023). About 85.2% resided in rural areas, and 53.3% were illiterate, highlighting a low human capital base that affects the adoption of modern poultry practices. The average household size was six. Farmers owned 0.77 hectares of land on average, with a quarter allocated for cereals. Around 59% had corrugated iron sheet-roofed houses, but 69.2% kept poultry in shared living spaces, indicating inadequate poultry housing infrastructure.

The primary income sources included livestock sales (29.9%) and crop sales (25.6%). Average revenue from poultry per production session was 368.5 Birr. Most income was directed toward immediate household needs like health care (49%) and basic items (38.6%), with limited reinvestment in poultry activities (only 12.3% found poultry income significant for business expansion). Farmers preferred exotic breeds (54.3%) for higher productivity, despite challenges like disease susceptibility (31.5%) and high costs (20.3%). Local breeds were favoured for their resilience. Key constraints included high feed costs, lack of credit, and poor adaptability of exotic breeds. And only 21.5% provided supplementary feed, often in small quantities. Most farmers followed unsystematic feeding without flock differentiation, leading to low productivity. Housing conditions were generally poor, with minimal separation from living quarters.

Access to poultry-specific extension services was low (only 32.3% coverage). Extension efforts such as demonstrations and training, had limited reach. Credit access was also restricted; only 13.5% of farmers accessed formal credit, primarily through Omo Microfinance. While 78% of farmers knew product prices beforehand, their sources were predominantly traders (53.7%) and markets (23.4%). However, modern communication channels like radio and print were underutilized, with only 38% using the radio for agricultural programs. This indicates the need for enhanced information dissemination mechanisms.

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Table 1: Demographic and socioeconomic characteristics of poultry farmers

Dummy Variables		Number of farmers	%
Sex of farmers	Male	210	70.7
	Female	87	29.3
Marital status	Married	232	78.1
	Single	65	21.9
Education of farmers	Literate	139	46.7
	Illiterate	158	53.3
Continuous Variables		Mean	Std
Age of farmers		37	9
Experience of farmers		12	5.4
Land holding size(hectare) of farmers		0.77	0.53
Distance to market in km		1 2.4	9.68
Discreet Variable		Number of farmers	%
Household size of farmers		6	2.6
Number of households having child below age six		131	44.1

Source: Author's field survey (2024)

Demographic Characteristics of Poultry Traders, Processors, and Consumers: Among the 29 poultry traders, 10 collectors, 17 retailers, and 2 wholesalers, the average age was 32.6 years, with 93.1% being male and 86.2% married. Most (79.3%) had formal education. The average trading experience was four years. The demographic profile suggests that poultry trading in the zone is male-dominated and led by relatively young, educated individuals.

Typically, restaurant and cafeteria owners, processors were mostly female (62.5%) with an average age of 35. About 75% were married and literate. The average family size was four, and their average annual income from poultry processing was approximately 39,400 Birr. Processing facilities were rudimentary, relying on basic cooking tools. From 54 consumers surveyed, the average age was 38.4 years, and 79.6% had formal education. Males accounted for 55.6% of consumers. The income range among consumers varied widely (5,897 to 101,235 Birr), indicating a diverse market base for poultry products. As education levels increased, so did poultry product consumption, suggesting that awareness and literacy influence consumer behaviour.

Table 2 Demographic characteristics of poultry processors and consumers

Type of Variables		Processors		Consumers	
		Mean	Std	Mean	Std
Dummy variables		Number of processors	%	Number traders	%
Sex	Male	3	37.5	30	55.6
	Female	5	62.5	24	44.4
Marital status	Married	6	75	39	72.2
	Single	2	25	15	27.8
Education	Literate	6	75	43	79.6
	Illiterate	2	25	11	20.4
Continuous variable					
Age		35	8.53	38.4	11.23

Source: Author's field survey (2024)

Value Chain Analysis of Poultry Products: Understanding the poultry products value chain is essential for enhancing the opportunities for all value chain actors. This analysis focuses on the roles, functions, and

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interrelationships of key actors, along with the flow of products and information. The poultry value chain in the Hadiya Zone involves a series of stages, from input supply to production, processing, trading, and consumption.

Poultry Products Value Chain Mapping and Functions: The poultry value chain starts with input suppliers, including local and exotic breeds, poultry feeds, veterinary services, and credit facilities. Notable organizations like Concern Ethiopia, World Vision, and Hosanna Breeding Center provide essential inputs. However, limited supply capacity and high demand for exotic breeds present challenges, indicating a need for improved infrastructure and enhanced input provision. The production phase is dominated by smallholder farmers, with 64% using free-range systems, 34% employing backyard production, and a minority relying on semi-intensive systems. This structure points to limited commercial poultry farming, where production is often geared more toward household consumption rather than market-oriented sales. Smallholder poultry production is hindered by low yields, especially from local chickens, and limited feed availability, which affects the overall productivity and market supply as shown in Figure 1 below.

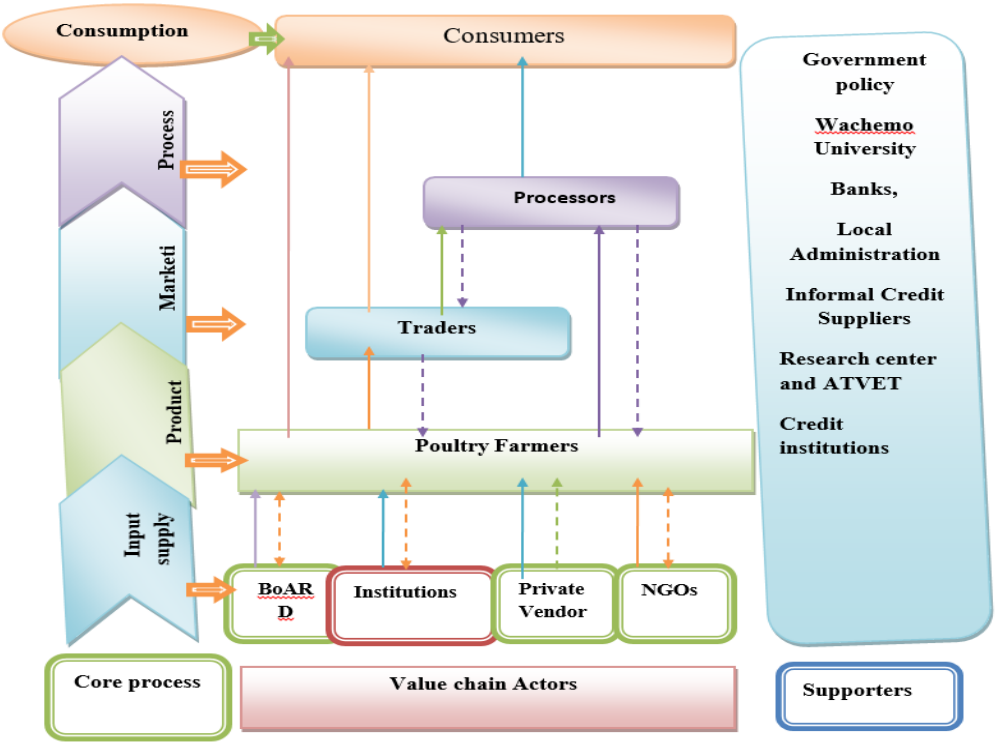

Figure 1: Poultry Products Value Chain Mapping and Functions

Represents the physical flow of inputs and products

Represents a flow of information and technologies

Represents a flow of information

Source: Own construction

Processing and Value Addition: Processing involves converting poultry products into various food items, such as traditional dishes (e.g., doro wot) and fast-food products like egg sandwiches. Hotels and restaurants are the primary processors, but they rely on traditional processing methods, with no significant adoption of improved technologies for packaging or product safety. Consequently, the value addition in this segment is minimal, and there is a notable gap in the value chain regarding processing efficiency and quality control as shown in below figure 2

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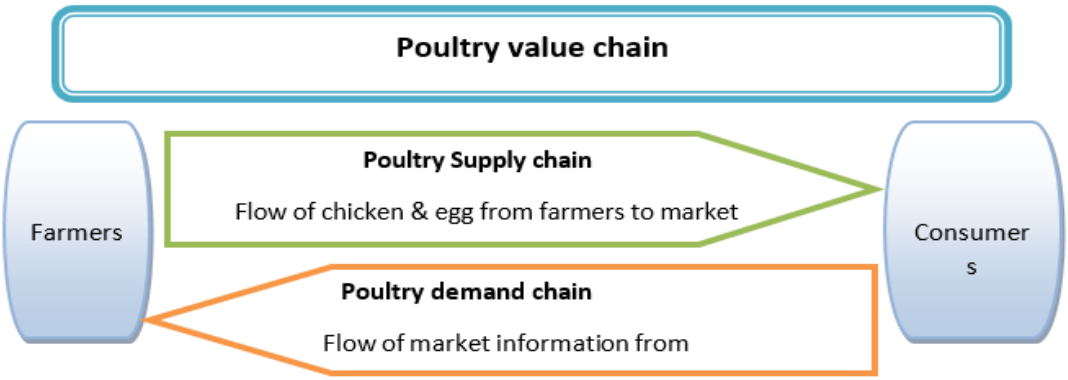

Figure 2: Poultry value chain

Constraints in the Poultry Value Chain: Input Supply Challenges: There is a shortage of quality feed, and farmers struggle with access to exotic breeds and veterinary services. Input suppliers like breeding centres are under-resourced, leading to limited production capacity. Production Constraints: The predominant use of traditional production methods (e.g., free-range and backyard systems) results in lower yields and limited market-oriented production. Moreover, poor access to credit hampers the growth of larger, more efficient poultry enterprises. Processing Limitations: Processing methods are rudimentary, lacking modern technologies that ensure product safety and quality. There are no dedicated actors for improved processing and packaging, which limits the marketability of poultry products.

Market Inefficiencies: Despite the presence of multiple marketing channels, the market remains fragmented. Farmers and traders often face challenges with fluctuating prices, inadequate infrastructure, and socio-cultural factors that influence pricing and sales, particularly for local chicken breeds. Policy and Institutional Gaps: There is a lack of effective policy and regulatory support for the poultry sector. The absence of standards for product quality assurance and limited collaboration among value chain actors further hinder growth. The need for public and private sector engagement to improve poultry value chain integration is evident.

Table 3: Poultry value chain actors' perspectives on constraints in poultry value chains

Problems/Constraints	% reporting problem	Importance of the problem (%)		
		Very important	Important	Less important
Shortage of capital	13	20	44	36
Shortage of skill experts	23	38	52	10
Shortage of feeds	92	76	20	4
Lack of clean water	27	11	36	53
Inadequate extension services	56	68	20	12
Inadequate institutional support	43	60	28	12
Low poultry productive and genetic performance	67	72	22	6
Limited veterinary services	39	57	30	13
High costs of exotic chicken and feed	37	45	30	25
No private investment in poultry production	19	17	30	53
Unreliable seasonal supply	25	23	40	37
Lack of technology	29	31	19	50

Source: Author's field survey (2024)

4.2. Econometric Model Result

Factors Affecting Poultry Farmers' Sales Decision: Before starting the analysis multi multicollinearity and Heteroscedasticity were checked before running the econometric model for both the discrete and dummy variables.

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According to Gujarati (2003), multicollinearity refers to a situation where it becomes difficult to identify the separate effect of independent variables on the dependent variable because of existing strong relationship among them. The two measures that are often suggested to test the existence of multicollinearity are the Variance Inflation Factor (VIF) and Contingency Coefficients (CC).

So, contingency Coefficients (CC) were used to check whether there was multicollinearity or not among the dummy or discrete variables. The value ranges between 0 and 1, with 0 indicating no association between the variables and a value close to 1 indicating a high degree of association between the variables. Hence, multicollinearity was not a serious problem among the hypothesized variables. Heteroscedasticity was also checked using SPSS 12 software to check the degree of heteroscedasticity and linear relationship among the variables. So, there was no a serious problem of heteroscedasticity and linearity.

To examine what factors affect poultry farmers' sales decision in the study area, sixteen variables which are focused on household head such as age, land holding size, sex, education status, distance to the market, household size, number of child below age six, experience in poultry farming, number of chickens owned, credit access, type of breed, market information, extension service, income other than poultry, veterinary service and feed supplement were the hypothesized variables for poultry farmers market participation decision.

The binomial logistic regression model was estimated using the maximum likelihood method. The overall model is significant at the 0.05 level as indicated by the log pseudo-likelihood value of 259.13. Moreover, based on the pseudo R^2 of 0.69, the model appears to have a good fit to the data (Table 4). The results indicated that education, distance to the nearest urban market, household size, presence of at least one child in the household, total number of chickens, breed type, alternative income sources, access to veterinary services, and supplementary feed significantly influenced the probability of poultry product sales decisions. These findings align with recent research on poultry value chains and smallholder market participation (Ayele et al., 2021; Abdullah et al., 2020)

The binomial logistic regression model indicated that the probability of selling poultry products increases (positively related) with education, number of chickens, access to exotic breeds, veterinary service, and feed supplementation practice of poultry farmers. However, the probability of selling poultry product decreases (negatively related) with distance away from urban market (market outlet), household size, having at least one child under the age of six, and availability of income other than the poultry industry of poultry farmers.

Education status: The hypothesis of this explanatory variable included in the binomial logistic model that showed significant relation with the household participation in poultry production for marketing. Educational status of the respondent found to positively and significantly influence household participation decision in poultry production for marketing at less than 1% probability level. The result of the binomial logistic model indicates that participation poultry production for marketing increase as the level of educational grade attended by the respondent increases. The possible reason could be higher educational level enhance the capacity of an individual to increase the production and diversification of livelihood and explore local, available opportunities.

Distance to the nearest market: As expected, it negatively and significantly influences the probability of market participation at the 5% significance level. Households located far from market centres incur higher transportation and related transaction costs, which can discourage participation in poultry product sales. This result is consistent with recent studies indicating that increased market distance is a significant barrier to smallholder commercialization and market integration (Mulugeta and Abebe, 2018; FAO, 2020).

Household size: On the contrary, was found to influence the market participation decision negatively and significantly at the 1% significance level. One possible explanation in the study area is that larger families might divert their labour toward various non-poultry activities to meet growing household needs. Alternatively, available labour resources might be allocated to other labour-intensive and more profitable agricultural businesses, limiting poultry market engagement. This finding aligns with recent studies emphasizing how household size can divert resources and reduce specialization in poultry production (Minten et al., 2020).

As hypothesized, the regression result shows that the number of chickens reared significantly and positively affects the quantity supplied to the market at the 5% significance level. This is likely because a larger flock size increases the

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volume of production, which enhances the likelihood of market participation. Farmers with more chickens are more inclined to produce surplus for sale, thereby increasing their involvement in poultry markets. This finding is consistent with recent studies which indicate that livestock holdings, especially poultry, are strongly correlated with marketable supply and commercial orientation (ILRI, 2021; Negassa and Rashid, 2020).

Number of chicken reared: As hypothesized, the regression results show that the number of chickens reared significantly and positively affects the quantity supplied to the market at the 5% significance level. This is likely because producers with larger flock sizes are more capable of generating surplus beyond household consumption, thereby increasing the likelihood of market participation. The higher the number of chickens owned, the greater the production volume, which enhances the commercial orientation of poultry farming. This result aligns with recent studies highlighting that livestock holdings, particularly in poultry, are a critical determinant of marketable surplus and market engagement among smallholder farmers (ILRI, 2021; Negassa and Rashid, 2020).

Access to poultry breed type: The result of the binomial logistic regression model analysis indicated that access to poultry breed type, such as exotic breed, could positively and significantly influence poultry farmers' sale participation decision in poultry marketing in the study area at a 5% probability significance level. Access and utilization of poultry breed type encourages the smallholder farmers to start poultry production and increase the volume of production small Smallholder farmers to decide on poultry marketing.

Income other than poultry business: Off-farm income significantly and negatively influences farmers' decisions to sell poultry products at the 5% significance level. This may be because households engaged in non-farm activities often allocate less time and resources to poultry management, leading to reduced production or lack of market motivation. Moreover, households with stable off-farm income sources may consume poultry products domestically rather than selling them, as they are less reliant on poultry as a financial buffer. This finding is consistent with more recent studies that show off-farm income reduces the commercial orientation of smallholder farmers by diverting labor and reducing market incentives (Tesfaye et al., 2022).

Veterinary services: Influenced the probability of market participation decision of poultry positively and statistically significantly at less than a 1 percent significance level. The most probable reason for this result might be that the households that have better veterinary service can reduce the mortality rate and also give confidence for farmers to proceed in the poultry business; this, in turn, would increase the flock size and its productivity. As a result, they could participate in the poultry production for the market.

Feed supplementation: The literature agrees that feed supplementation for poultry in the traditional type of production system significantly increases their productivity. The above result also revealed that feed supplementation highly affects the farmers' decision of Poultry product supply positively at less than a one percent level of significance. When the household supplements feed for his scavenger chickens, the probability of the producers' decision in favor of participation in supplying poultry products increases at a significant level.

Table 4: Results of the Binary logistic regression model on factors affecting the decision to sell poultry products

No	Variables in the Equation	B	S.E.	Wald	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	Upper
1	AGE	-.265	.600	.195	.659	.767	.236	2.489
2	LAND	-.883	.462	3.646	.056*	.414	.167	1.024
3	SEX	-.965	.595	2.631	.105	.381	.119	1.223
4	EDU	3.698	.994	13.851	.000***	40.378	5.758	283.132
5	DIST	-1.454	.549	7.004	.008**	.234	.080	.686
6	HSIZE	-3.080	.590	27.225	.000***	.046	.014	.146
7	CHILD	-2.463	.977	6.361	.012**	.085	.013	.578
8	EXP	.587	.463	1.605	.205	1.799	.725	4.460
9	CHICKEN	1.917	.941	4.151	.042**	6.799	1.076	42.974
10	CREDIT	1.085	.603	3.241	.072*	2.960	.908	9.650

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11	BREED	1.329	.586	5.153	.023**	3.779	1.199	11.906
12	INFO	.698	.558	1.566	.211	2.010	.674	5.995
13	EXT	.157	.643	.059	.808	1.169	.332	4.124
14	INCOME	-3.971	1.321	9.032	.003***	.019	.001	.251
15	VETERNARY	5.327	1.688	9.955	.002***	205.75	7.522	5.628E3
16	SUPPLEMENT	2.453	.622	15.541	.000***	11.619	3.432	39.332
	Constant	-3.831	1.954	3.844	.050**	.022		

Source: Author's field survey (2024)

5. CONCLUSION AND RECOMMENDATIONS

Conclusion: This study was conducted to analyse market access and the value chain of the poultry industry in the Hadiya Zone of central Ethiopia. The specific objectives included: examining the poultry value chain and its constraints; identifying factors influencing poultry farmers' sales decisions; and analysing marketing channels and outlet choices of poultry farm households. Data were collected from 297 poultry-producing households in Lemo and Misrak Badawacho districts, 25 traders and 8 processors from Hossana town, and 54 consumers, using semi-structured questionnaires, interviews, and checklists. Descriptive statistics and econometric models (binomial and multinomial logistic regression) were applied using STATA software.

Before the regression analysis, diagnostic tests for multicollinearity and heteroscedasticity were conducted. Using Contingency Coefficients (CC) and Variance Inflation Factor (VIF) tests, it was confirmed that multicollinearity was not a serious concern among the hypothesized variables. Similarly, heteroscedasticity was assessed using SPSS software, and no significant issues were detected, confirming the appropriateness of the model.

The binomial logistic regression analysis successfully identified key factors influencing poultry farmers' sales decisions in the study area. The model was statistically significant at the 5% level, with a pseudo R^2 of 0.69, indicating a good fit. Results showed that education level, number of chickens owned, access to exotic poultry breeds, veterinary services, and feed supplementation positively and significantly influenced farmers' market participation. This suggests that better education and access to technical support improve production and market-oriented behaviour among poultry farmers.

Conversely, distance to the nearest market, household size, presence of children under six years old, and access to income sources other than poultry farming negatively affected sales decisions. Farmers farther from markets faced higher transaction costs, discouraging participation, while larger household sizes and alternative income opportunities reduced reliance on poultry sales. Overall, the study underscores the importance of improving education, veterinary support, market access, and feed resources to enhance poultry market participation. These findings align with previous research and provide actionable insights for policymakers aiming to strengthen the poultry value chain in rural areas.

Recommendation: Based on the findings of the study, the following recommendations are proposed to enhance poultry farmers' market participation in the study area:

- Improve Farmers' Education and Training: Since education level significantly influences poultry market participation, stakeholders such as government agencies and NGOs should design and implement adult education programs, training workshops, and extension services specifically targeting poultry production and marketing skills. Enhancing farmers' knowledge and managerial capacity will increase their production efficiency and market engagement.
- Facilitate Access to Exotic Breeds**:** Access to improved poultry breeds positively impacts sales decisions. It is recommended that agricultural offices and development organizations strengthen breed improvement programs and ensure that smallholder farmers have easy access to high-yield, exotic poultry breeds through subsidized schemes or community-based breeding centres.
- Strengthen Veterinary Services: Veterinary services significantly contribute to higher market participation by improving flock health and reducing mortality. Local governments and agricultural bureaus should increase the

availability and quality of veterinary services, including vaccination campaigns, regular health checks, and mobile veterinary clinics, especially in remote areas.

- Enhance Availability of Feed Supplements: Since feed supplementation boosts poultry productivity and market participation, support should be given to farmers to access affordable and quality poultry feed. Encouraging local feed production enterprises and providing training on feed formulation using locally available materials could be sustainable approaches.
- Improve Market Accessibility: The negative influence of distance to market calls for improved rural infrastructure. Investment in better road networks, establishment of nearby poultry collection centres, and promotion of local market linkages would reduce transportation costs and motivate farmers to increase market participation.
- Promote Integrated Livelihood Programs: Given that alternative income sources reduce reliance on poultry farming, livelihood programs should aim to integrate poultry production as a key component of rural income strategies. Incentives should be offered to encourage diversification without side-lining poultry production.
- Support Family Labour Management: Larger household sizes, particularly with young children, can divert labour from poultry activities. Extension programs should include labour-saving technologies and promote cooperative group models where families can collectively manage poultry enterprises efficiently.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

The author hereby declares that generative AI technologies such as Large Language Models have been used during the editing of the manuscript. The details of the AI usage are provided below:

1. Name and Source of Generative AI Technology: ChatGPT, developed by OpenAI
2. Version and Model: GPT-4-turbo, May 2025 release
3. Input Prompts Provided to the AI:
   - ✓ Language editing of this manuscript.
   - ✓ Please improve grammar, coherence, and flow in the attached academic paper
   - ✓ Polish the language while preserving the original structure and meaning.

   The AI was used solely for language enhancement, including grammar correction, clarity improvement, and academic tone refinement.

DECLARATION OF CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper.

REFRENCES

[1] Abdullah, D., Sulaiman, N., & Hassan, S. (2020). Factors affecting farmers' participation in poultry markets: A logistic regression approach. *Journal of Agriculture and Rural Development in the Tropics and Subtropics, 121*(1), 23–34.

[2] Agresti, A. (2007). *An introduction to categorical data analysis* (2nd ed.). Wiley-Interscience.

[3] Akinola, L. A., Adeniran, A. A., & Oladipo, O. A. (2022). Socioeconomic benefits of small-scale poultry production among rural women in Sub-Saharan Africa. *Journal of Rural Development, 41*(3), 213–229.

[4] Ayele, G., Berhanu, G., & Alemu, D. (2021). *Poultry value chain and market participation in Ethiopia: A micro-level analysis* (ILRI Research Report). International Livestock Research Institute.

[5] Central Statistical Agency (CSA). (2023). *Agricultural sample survey 2022/23: Volume II. Report on livestock and livestock characteristics (Private peasant holdings)*. Addis Ababa, Ethiopia.

[6] Central Statistical Agency (CSA). (2020). *Agricultural sample survey 2019/20: Volume II. Report on livestock and livestock characteristics (Private peasant holdings)*. Addis Ababa, Ethiopia.

[7] Central Statistical Authority (CSA). (2017). Federal Democratic Republic of Ethiopia, population projection of Ethiopia for all regions at Woreda level from 2014-2017. Addis Ababa, Ethiopia.

[8] Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). John Wiley & Sons.

[9] Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

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[10] Dessie, T., Tadelle, D., & Dana, N. (2013). *Village chicken production in the tropics: Characteristics, opportunities and constraints*. International Livestock Research Institute (ILRI).
[11] Food and Agriculture Organization (FAO). (2023). The state of food and agriculture 2023: Innovation in food systems. Rome: FAO.
[12] FAO. (2020). *The state of agricultural commodity markets 2020: Agricultural markets and sustainable development*. Food and Agriculture Organization of the United Nations.
[13] Food and Agriculture Organization (FAO). (2021). *Poultry sector review: Ethiopia*. Rome: FAO.
[14] Gujarati, D. N. (2003). *Basic econometrics* (4th ed.). McGraw-Hill.
[15] Hailemariam, F., & Zemedu, L. (2018). Value chain analysis of poultry in Ethiopia: A review. *International Journal of Livestock Production, 9*(11), 289–296. https://doi.org/10.5897/IJLP2018.0533
[16] Hadiya Zone Agriculture Office. (2024). *Annual report on poultry sector development in Hadiya Zone*. Hossana, Ethiopia.
[17] ILRI (International Livestock Research Institute). (2021). *Poultry sector development in Ethiopia: Lessons and opportunities* (ILRI Discussion Paper).
[18] International Livestock Research Institute (ILRI). (2023). *Ethiopia national poultry development strategy 2022–2031*. https://www.ilri.org/knowledge/publications/ethiopia-national-poultry-development-strategy-2022-2031
[19] Mensah-Bonsu, A., Lartey, N. N., & Kuwornu, J. K. M. (2019). Gender-segregated analysis of the poultry value chain in Ghana. *Gender, Technology and Development, 23*(2), 130–164. https://doi.org/10.1080/09718524.2019.1661611
[20] Ministry of Agriculture (MoA). (2024). *Ethiopia's livestock master plan: 2024–2028*. Addis Ababa, Ethiopia.
[21] Minten, B., Mohammed, B., & Tamru, S. (2020). *Emerging medium-scale tenant farming, gig economies, and the Covid-19 disruption: The case of commercial vegetable clusters in Ethiopia* (IFPRI Working Paper No. 151). International Food Policy Research Institute.
[22] Mulugeta, D., & Abebe, G. (2018). Determinants of smallholder farmers' participation in output markets: Evidence from cereal producers in Ethiopia. *African Journal of Agricultural Research, 13*(41), 2319–2328. https://doi.org/10.5897/AJAR2018.13582
[23] Negassa, A., & Rashid, S. (2020). *Livestock production and marketing in Ethiopia: Key issues and policy implications* (IFPRI Working Paper). International Food Policy Research Institute.
[24] Organisation for Economic Co-operation and Development (OECD) & Food and Agriculture Organization (FAO). (2024). *OECD-FAO agricultural outlook 2024–2033*. https://www.oecd.org/en/publications/2024/07/oecd-fao-agricultural-outlook-2024-2033_e173f332.html
[25] Tadelle, D., Alemu, Y., & Mekonnen, H. M. (2023). Gender and household poultry production in Ethiopia: Opportunities and policy gaps. *Ethiopian Journal of Animal Production, 23*(1), 55–70.
[26] Tesfaye, A., Woldehanna, T., & Kassie, M. (2022). Off-farm income and agricultural commercialization in rural Ethiopia. *Development Studies Research, 9*(1), 45–57. https://doi.org/10.1080/21665095.2022.2037649