

Evaluation of Poultry Value Chain in Kebbi State, Nigeria

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Abstract

The study analyzed poultry value chain in Kebbi State, Nigeria. Data for this study were collected using semi structured survey questionnaires. Both simple random and purposive sampling methods were used to select the respondents from different segments of the entire value chain. 40 poultry farmers were randomly selected, 30 traders and 20 Processors were used from the four agricultural zones, thus, giving a total number of 90 sample size for the study. The analytical techniques for the study are functional analysis, descriptive statistics, marketing margin and Net Farm Income. Results from the study revealed that the main poultry value chain actors are input suppliers, farmers, processors and traders. They are involved in supply and production of inputs, live birds, distribution, marketing and processing of poultry products. Both poultry farmer's processors and traders realized a profit of (N75,511, N37,121 and N41,950, respectively). However, farmers realized more profit. The major technology of production in poultry production is Deep litter system (51%). The main market channel for poultry starts from the farmers to local retailers to domestic market to the consumers on to the processors before it gets to the consumers. The major constraints encountered by the poultry value chain actors include the following; for farmers, the major constraints, include High cost of day-old chicks (90.0%), day old chicks not available in the State (80.0%), high cost of feeds (67.5%), incidence of diseases (52.5%) among others. The major constraints affecting processors include lack of processing facilities (85.0%), seasonal demand (65.0%), high cost of electricity (50.0%), price fluctuation (45.0%) and lack of credit facilities (35.0%) among others. The major constraints affecting poultry traders are high transportation cost (86.7%), limited market information (70.0%), diseases (60.0%) and fluctuation in prices (40.0%). It is recommended that all the poultry value chain actors be supported in order to secure inputs of subsidized rate and timely. Farmers should also be supported with a base within the state in order to secure day old chicks and feeds of affordable cost.

Keywords: Poultry, Value Chain, Kebbi State, Nigeria.

1. Introduction

Poultry production has been a future of human society for thousands of years [1]. To ensure that it continues to make positive and sustainable contributions to stable human society, it is essential that production and marketing are tailored to local conditions and associated value chains, maximize nutrient cycling and efficient utilization of all products and maintain genetic diversity [1].

Poultry farming is the process of raising different types of domestic birds commercially for the purpose of meat, eggs and feather production [2]. The most common and widely raised poultry birds are chicken (both meat and eggs of chicken). The chickens raised for eggs are called layer chickens, and the chickens which are raised for their meat production are called broiler chickens [2]. Poultry are used as source of food, income, employment and the products are also used as raw materials for the production of other commodities.

Kuwornu et al., defined a value chain as the series of events which are required to bring a good or services from production to the final consumers in the desired form and their

utmost disposal after use. Poultry value chain include fresh egg production, meat production and related inputs that directly involve poultry (e.g. breeders, fertilized eggs, day old chicks) as well as other inputs (feed and veterinary care) and support services (financing, transport, packaging, extension, and technical support). Actors performing each function may be specialized by an end product or be active for both eggs and meat, as well as perform multiple functions for domestic and import supplies [3].

The Nigerian poultry value chain is growing fast and transforming [4]. This is linked to Nigerian diets including more eggs and poultry meat for nutrition, as well as increasing sources of income, also due to the urbanization occurrence [4]. A poultry chain can involve production, transport, processing, packaging, storage, and retailing of poultry and poultry products to the final consumer, with products increasing in value at every stage [5].

Poultry serve as source of income, employment to the teaming youths, source of organic manure to the crop farmers,

food in the form of eggs, meat and also serve as a source of raw materials for the production of other commodities such as the feathers been used for camouflage.

Although Nigeria is a major producer of so many Agricultural commodities such as Cereals, Aquaculture, Roots and Tubers, Poultry among others, yet, the Country is reported as an import economy with so many of these commodities being imported from other nations. There are a number of farm surveys on poultry and other livestock farms, but extremely few or scarce survey studies on poultry farm supplies, producers, traders and distributors in Nigeria generally and Kebbi State in particular. If the Poultry Value Chain in the study area is assessed by creating understanding on how it works, information provided from the study is likely to be beneficial to both existing and prospective investors in poultry industry by providing ample information to policy makers, existing and prospective investors on poultry actors on the profit realized, technology of production and the different challenges associated with the development of poultry value chain and suggesting strategies for improvement of the various actors, this will assist on how to develop sustainability. Studying the entire value chain for poultry hopes to provide information that will guide existing and prospective investors on which intervention is required in order to enhance meat, egg and other product availability and increase supply of poultry products to the market at affordable prices. Researchers and policymakers are also likely to benefit from the outcome of this study. It is against this backdrop that this study hopes to find answers to the following research questions.

- Who are the actors in poultry value chain and what are their functions in the study area?
- What is the cost, returns and profit among the actors in poultry value chain?
- What technology of production is used for poultry production in the study area?
- How is the marketing channel for poultry in the study?
- What are the different challenges associated with the development of poultry value chain in the study area?

2. Methodology

2.1. Study Area

The study was carried out in Kebbi State, Nigeria. Kebbi state is in the North western part of the country. The state lies between latitude 10°08' N and 13°15' N and longitude 3°30' E and 6°02' E, covering a total land area of about 36,129 square kilometers. The state has boundaries with Sokoto State to the North and East, Niger State to the south in Nigeria and it shares on international border with the Republic of Benin to the west. Kebbi State was formed out of Sokoto State in August 27, 1991 by the regime of General Ibrahim Badamosi Babangida. Its capital is in Birnin Kebbi. Its major towns include Birnin Kebbi, Argungu, Yauri and Zuru. Kebbi State is made up of 21 Local Government Areas, four

emirate councils (Gwandu, Argungu, Yauri and Zuru), and 35 districts. The state has a population of 3,351,831 according to 2006 census. Projecting this population to the year 2020 at 3% growth rate reveals the population as 4,351,067 [6]. Over two-third of the population are engaged in agricultural production, mainly arable crop alongside cash crops with livestock production.

2.2. Data Collection

Data for this study was collected using semi structured survey questionnaires designed in line with the purpose of the study and interview of key informants. Data collection focused on the different actors in poultry value chain, input suppliers such as day-old chick's producers, drugs sellers/producers, information was elicited from the various actors on technology of production, cost of inputs, output of traders, processors, farmers and their various costs, problems encountered across the different segments, market channel for poultry products among others.

2.3. Sampling Procedure and Sample Size

Both simple random and purposive sampling methods were used to select the respondents from different segments of the entire value chain, 40 poultry farmers were randomly selected, 30 traders and 20 processors were used from the four agricultural zones, thus, giving a total number of 90 sample size for the study.

2.4. Analytical Technique

The analytical tools used for the study included: Functional analysis for objective 1, Descriptive statistics, Marketing Margin, and Net Farm Income. Functional analysis was used to achieve objective 1, Descriptive statistics for objectives 3, 4 and 5, Marketing margin and Net Farm Income (NFI) for objective 2 in the study.

2.5. Functional Analysis Model is shown as;

- The principal functions in the chain
- The principal product of the chain (the various forms into which it is transformed throughout the chain).
- The agents (aspects of the agents) carrying out those functions; and

2.6. Net Farm Income Model

Net Farm Income (NFI) = TR – TC

Where TR = Total Revenue

TC = Total Cost

TC = TFC + TVC

TFC = Total Fixed Cost

TVC = Total Variable Cost

π = Profit

2.7. Marketing Margin

= Selling Price – Producer Price/Selling Price

Table 1: Functional Analysis of Actors in poultry value chain in Kebbi State, Nigeria

Value chain Actors	Stage of the value chain	Functions	Agents	Outputs
Input suppliers	Input supply	Production of inputs	- Dealers - Day old chicks	- Day old chicks - Feeds - Farm tools - Vaccine - Drugs
Farmers	Production Trade (Poultry, Birds and eggs)	- Rearing of birds	- Small holder farmers - Poultry traders - Egg traders	- Live birds - Eggs - Live birds and egg delivered to restaurants
Processors	Processing	- Roasting - Frying - Restaurants as food eateries	Village/city processors - Restaurant owners - Tea/Indomie makers	- Roasted chicken - Fired chicken - Fired egg - Processed birds in freezers
Traders	Marketing	- Trade - Transportation	- Wholesalers, retail traders - Transportation	- Live birds delivered to city/market

Source: Field survey, 2022.

Input suppliers: The first value chain refers to the input suppliers who play a very important role in the value chain by providing the needed inputs required by the poultry farmers for production. These inputs suppliers include dealers, veterinary research station involved in the production of drugs and vaccines, day old chicks, producers, feeds producers etc.

Farmers: The second value chain actors are the farmers. Rearing of poultry birds and production of eggs take place at this stage for further processing. The smallholder farmers produce the live birds and eggs that are made available to the consumers or the processors such as restaurant owners, chicken roasters, fryers etc.

Poultry traders: At the third stage, trading of both live birds and eggs take place and the value chain actors are the traders. Poultry birds and eggs traders purchase birds and eggs from individual farmers and sell to processors or wholesalers, poultry/egg buyers. The live eggs and birds are sold to consumers or restaurants owners or supermarket for selling.

Poultry processors: This is the fourth stage of poultry value chain. This group are involved in frying and roasting of poultry. They are also found in restaurants where food is sold. And are also involved in selling poultry products in the freezers.

Table 2: Average cost and returns analysis of poultry production (farmers) in Kebbi State

Variable	Average (N)	Total (N)	Percentage
Variable Cost			
Cost of Labor	36,000	1,440,000	16.50
Cost of transportation	7,700	308,000	3.53
Cost of Day old chicks	102,000	4,080,000	46.75
Cost of Medication	12,400	496,000	5.68
Cost of Feeds	49,000	1,960,000	22.46
Cost of water Consumed	5,700	228,000	2.61
Tax/Commission	3,200	128,000	1.47
Total Variable Cost	216,000	8,640,000	99.00
Fixed Cost (FC)			
Depreciation Feed trough	560	22,400	0.26
Depreciation of Basin	487	19,480	0.22
Depreciation of Watering can	395	15,800	0.18
Depreciation of Rake	154	6,160	0.07
Depreciation of Broom	110	4,400	0.05

Depreciation of Building	380	15,200	0.17
Depreciation of Knife	102	4,080	0.05
Total Fixed Cost (TC)	2,188	87,520	1.00
Total Cost (TC)	218,188		100.00
Revenue (R)			
Revenue from Live birds	271,000		
Revenue from Consumed birds	13,200		
Revenue from Manure	9,500		
Total Revenue (TR)	293,700		
Net Income TR – C	75,512		

Source: Field Survey, 2022

The cost and returns analysis in Table 4.2 reveals that the variable cost was N216,000. This shows the amount of money spent by the farmers in the study area for purchase of variable cost e.g labor, transportation, day old chicks, medications and cost of feeds fed to the birds, cost of water consumed and tax and commission cost. Results from Table 4.2 revealed the fixed cost items of the farmers during produc-

tion like depreciation cost of feed trough, cost of basin used and cost of watering can, cost of rake, broom, building and cost of knife which account for N2,188. While N218,188 as the total cost. Total revenue of N293,700 was realized from the money generated from live birds sold, consumed birds and manure sold. Net Income of N75,512 was realized as profit, suggesting that poultry business is profitable.

Table 3: Average cost and returns analysis of poultry processing (Processors) in Kebbi State

Variable	Average (N)	Total (N)	Percentage (N)
Variable Cost			
Cost labour	8,800	176,000	14.14
Cost live birds	33,650	673,000	54.08
Cost of Firewood	6,040	120,800	9.70
Cost of Oil	3,500	70,000	5.63
Cost of Spices	1,250	25,000	2.01
Cost of Salts	350	12,000	0.56
Cost of Package material	600	12,000	0.96
Cost of Kerosene	120	2,400	0.19
Cost of transportation	550	11,000	0.88
Cost of Leather	320	6,400	0.52
Cost of water	5,000	100,000	8.04
Total Variable Cost	60,180	1,203,600	96.70
Fixed Cost			
Depreciation on tables /benches	330	6,600	0.53
Depreciation on bucket	122	2,440	0.19
Depreciation on Jerry can	240	48,000	0.38
Depreciation on show glass	450	9,000	0.73
Depreciation on building or shop	610	12,200	0.98
Depreciation on knife	85	1,700	0.14
Depreciation on tray	92	1,840	0.15
Depreciation on frying pan	110	2,200	0.17
Total Fixed Cost (TC)	2,039	40,780	3.30
Total Cost (TC)	62,219		100.00
Total Revenue	99,340		
Net income TR – TC	37,121		

Source: Field Survey, 2022

The cost and return analysis in Table 4.3 reveals that the variable cost was 60,180, this shows the amount of money spent by the processors in the study area for cost of labour, cost of firewood, cost of kerosene, cost of oil, cost of transportation, cost of salt, cost of spices, cost of package materials and cost of leather. Results further revealed the fixed cost items for processing consisting of depreciation of table/benches, depreciation of buckets, depreciation on jerry can, depreciation on building and shop, depreciation on knife, depreciation on tray and depreciation on frying pan e.t.c. accounts for N2,039. While N62,219 was expended as then total cost and then total revenue of N99,340 was generated. Net Income of N37,121 was realized as profit suggesting that poultry processing is profitable in the study area.

The cost and returns analysis in Table 4.4 reveals that the trading cost incurred by the traders was N106,200. This shows the amount of money spent by the actors in the study area for purchase of live birds, cost of loading, cost of off-loading, cost of transportation and tax/commission cost. The total revenue generated was N148,150. The Net Income of N41,950. was generated implying that poultry trading is profitable.

Comparing the results of Table 4.2, 4.3 and 4.4 revealed that even though poultry value chain actors such as farmers, processors and traders realized profit to the tune of N75,511, N37,121 and N41,950 respectively, however farmers realized more profit followed by traders and processors in the order of magnitude of profit realized.

Table 4: Average cost and returns analysis of poultry trading (Traders) in Kebbi State

Variable	Average N	Total N	Percentage
Trading cost			
Cost of live birds	88,000	2,640,000	82.86
Cost of Loading	1,800	54,000	1.69
Cost of off loading	2,500	75,000	2.36
Cost of Transportation	11,500	345,000	10.83
Tax/Commission	2,400	72,000	2.26
Total Trading cost	106,200	3,186,000	100
Total Revenue (TR)	148,150		
Net income TR – TC	41,950		

Source: Field Survey, 2022

Table 5: Analysis of poultry production according to production technology usage

Actors		*Frequency	Percentage
1.	High cost of day-old chicks	36	90.0
2.	Day old chicks not available in the State	32	80.0
3.	High cost of feeds	27	67.5
4.	Problem of diseases	21	52.5
5.	Veterinary service providers are not adequate	18	45.0
6.	Demand for lives birds are seasonal	11	27.5

Source: Field Survey, 2022

Results in Table 4.5 revealed that in terms of technology of production used by the poultry farmers 5.0% use Automated battery cage system while 32.5% use local battery cage system, 52.5% use deep liter system while 10.0% use both local battery cage and deep liter system. This suggests that majority of the farmers use deep liter system. This could mean that if the poultry farmers are to be supported to increase their capacity in production, there is need to support them towards the use of automated battery cage.

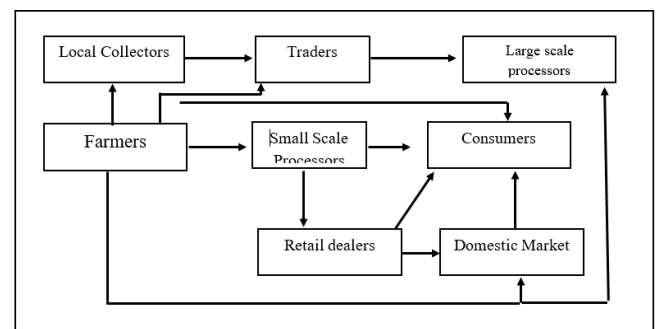


Figure 1: Market channel for poultry in Kebbi State

Figure 4.1 showed the market channel for poultry value chain in Kebbi State, Nigeria. The chain starts from the farmers who are the major distributors of live birds and eggs. They distribute to the local collectors, traders, small scale processors, domestic market, large scale processors and also distribute directly to the consumers. The figure also re-

vealed that local collectors distribute poultry products to the traders, and the traders distribute to the large scale processors. The small-scale processors then distribute to the retail dealers and the retail dealers distribute to domestic market and finally consumers access the products at the domestic market.

Table 6: Distribution of poultry farmers according to major constraints faced

Actors	*Frequency	Percentage
1. High cost of day-old chicks	36	90.0
2. Day old chicks not available in the State	32	80.0
3. High cost of feeds	27	67.5
4. Problem of diseases	21	52.5
5. Veterinary service providers are not adequate	18	45.0
6. Demand for lives birds are seasonal	11	27.5

Source: Field survey, 2022

*Multiple responses were recorded.

Results in Table 4.6 revealed that in order of magnitude of the prevailing constraints faced by the poultry farmers, they reported high cost of day-old chicks as the major constraints (90.0%). The second constraint is day old chicks not available in the State (80.0%). High cost of feeds was also reported as the third most prevailing constraint (67.5%),

while problem of diseases was reported as the fourth main constraint (52.57%), veterinary service providers are not adequate (45.0%) was the fifth constraint reported while demand for live birds are seasonal (27.5%) was the last constraint reported.

Table 7: Distribution of poultry processors according to major constraints faced

Actors	*Frequency	Percentage
1. Lack of processing facilities	17	85.0
2. Seasonal demand	13	65.0
3. High cost of electricity	10	50.0
4. Price fluctuation	9	45.0
5. Lack of credit facilities	7	35.0

Source: Field survey, 2022

*Multiple response was recorded.

3.1. Constraints faced by poultry processors

Results in Table 4.7 revealed the constraints associated with poultry processors in the study area. Results indicated that 85.0% reported lack of processing facilities, 65.0% indicated

seasonal demand (monthly, when salaries are paid), 50.0% indicated high cost of electricity, 45.0% indicated price fluctuation and 35.0% indicated lack of credit facilities.

Table 8: Distribution of poultry traders according to major constraints faced

Actors	*Frequency	Percentage
1. High transportation cost	26	86.7
2. Limited market information	21	70.0
3. Diseases	18	60.0
4. Fluctuation in price	12	40.0

Source: Field survey, 2022

*Multiple response was recorded.

3.2. Constraints faced by poultry traders

Table 4.8 revealed the distribution of constraints faced by poultry traders in the study area. Results indicated that the major constraints faced by poultry traders are high transportation cost (86.7%), limited market information (70%), Disease infestation (60.0%), and fluctuation in prices (40%). This implies that if poultry processors are to overcome the myriads of constraints faced, they must be supported in the areas of inputs, equipment, transportations subsidizing cost among others.

4. Conclusion

Based on the findings of this study, the study concludes that the main poultry value chain actors are input suppliers, farmers, processors and traders. They are involved in supply and production of inputs, live birds, distribution, marketing and processing of poultry products. Both poultry farmers, processors and traders realized a profit of (N75,511, N37,121 and N41,950, respectively), however farmers realized more profit. The major technology of production in poultry production is deep litter system (51%). The main market channel for poultry starts from the farmers to local retailers to domestic market to the consumers on to the processors before it gets to the consumers.

The major constraints encountered by the poultry value chain actors include the following; For farmers, the major constraint, include High cost of day-old chicks (90.0%), day old chicks not available in the State (80.0%), high cost of feeds (67.5%), incidence of diseases (52.5%) among oth-

ers. The major constraints affecting processors include lack of processing facilities (85.0%), seasonal demand (65.0%), high cost of electricity (50.0%), price fluctuation (45.0%) and lack of credit facilities (35.0%) among others. The major constraints affecting poultry traders are high transportation cost (86.7%), limited market information (70.0%), diseases (60.0%) and fluctuation in prices (40.0%).

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