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ECONOMIC ANALYSIS OF CATTLE MARKETING AND RISKS AMONG TRADERS IN NORTH-CENTRAL NIGERIA

Emmanuel A. Atser[1*], Dr. Felix T. G. Ashiko[2], Dr. M. M. Atagher[3], Dr. T. J. Hanmaikyur[4]

[1,2,3]Department of Agribusiness Management, Joseph Sarwuan Tarka University, Makurdi Benue State Nigeria.*
[4]Department of Business Administration, Joseph Sarwuan Tarka University, Makurdi Benue State Nigeria.

Corresponding Author:

Abstract

The study analyzed cattle marketing and risks among traders in North-Central Nigeria. It considered the socio-economic characteristics of cattle marketers; Primary data were collected from 350 market intermediaries using stratified sampling techniques. The methods of data analysis included descriptive statistics such as frequency distribution tables, mean and percentages. Results revealed that for objective one, cattle marketing is male dominated as 100% of market intermediaries were males. Age was also a significant positive attribute of cattle marketing which revealed that 64.3% of respondents were less than 50 years, hence physically capable of undertaking the business. Findings of objective two revealed three types of intermediaries who were found to be very important in cattle marketing in the study area. These included wholesalers, retailers, and brokers. Result of objective three of the study indicates that there was no fixed cost item because traders did not own either a warehouse or a truck. Most of their expenses were restricted to the operational costs of maintaining the animals in terms of supplementary feeding before final conveyance to the distant markets as well as taxes/levies paid in transit and thus only gross margin could be calculated. The researcher concluded that cattle marketing in North-Central Nigeria was profitable despite that wholesalers incurred the high costs, followed by retailers and brokers, largely from transportation cost. The study recommended among others that credit institutions should support cattle marketing, illegal taxes and levies on cattle marketing should be eliminated while on transit as well as provision of good and affordable transport system.

Keywords: *Cattle, Retailers, Business Risk, Socioeconomic characteristics, Nigeria*

1.0 INTRODUCTION

Livestock are animals kept or raised domestically or as farm animals for use, pleasure or profit. Livestock includes cattle, sheep, goats, horses donkeys, camels, pigs, among others. They are raised for their meat, milk, wool and other valuable products. Livestock are regarded as assets (Cevrimli, Mat, Tekindal and Gunlu, 2022). Livestock business is a source of employment and livelihood in Nigeria. Cattle are the most popular and highly valued livestock in Nigeria (Mafimisebi, Bobola and Mafimisebi, 2013). Nigeria is among the leading countries in cattle business in sub-Saharan Africa (Girei, Dire and Bello, 2013). In 2008, Nigeria had more than 14.73 million cattle consisting of 1.47million milking cows and 13.26million beef cattle.

Cattle marketing process ensures the delivery of cattle to the buyers in the form, place and time needed (Girei, Dire and Bello, 2013). The process of moving the cattle from where they are surpluses to where they are shortages is known as arbitraging. An understanding of this process will enhance the efficient working of cattle markets, which is important in achieving sustainable and profitable agricultural commercialization in the livestock sub-sector in North-Central Nigeria in particular and Nigeria in general (Mafimisebi, Bobola and Mafimisebi, 2013; Musa, Iheanacho and Nyiatagher, 2018). Livestock enterprises encounter various risk factors during their entire process, i.e. from the beginning of production to the marketing of the final product, and efforts should be put into manage them. Economic risk factors in livestock enterprises include a decrease in their livestock capital due to animal diseases, yield losses, and animal death. A significant role in effectively implementing necessary measures involves a healthy determination of risks in the production and marketing process (Cevrimli and Sakarya, 2019). As a result of the clear determination of risk factors, the insurance company can insure these risks. Therefore, studying risk factors is important for both producers and marketers involved in cattle business.

According to Filani (2006) and Mafimisebi *et al*. (2013), the supply of cattle and its products has witnessed a decline while the demand has been increasing with the result being a shortfall in the supply. The domestic supply of animal protein is growing at 1.8 percent while the overall demand is estimated to rise at 51 percent. The high cost of marketing cattle is often the commonly cited reason for this situation. Owing to the considerable spatial separation of production area from consumption area and risk factors, there is high handling cost especially in relation to cattle transportation. Thus, an understanding of how cattle markets work and the risk factors associated with cattle marketing business is a desideratum for sustainable commercialization of cattle business at increasing accessibility to and affordability of beef.

Statement of the Problem

Cattle is mostly produced in Northern Nigeria but mostly consumed in other parts of the country (Adamu, Filani and Mamman, 2005). This has led to a situation in which there is a multiplicity of intermediaries and stakeholders in the cattle marketing chain (Musa, Iheanacho and Nyiatagher 2018). The challenge posed by this has been increased transaction costs and thus, upward trending final retail price of cattle and its products. The effect of the activities of these intermediaries and stakeholders as well as the risks associated with cattle marketing is capable of making cattle and its products inaccessible to the poor who feed mostly on diets deficient in animal proteins (Mafimisebi, 2011). Movement of cattle from the North to other parts of Nigeria presents a daunting challenge because it is both a costly and risky business. Cattle are kept standing and in some cases, lying in the vehicle throughout the whole journey of between 1 – 2 days. Most rural roads in North-Central of Nigeria in particular and the country at large are seasonal and inoperable during the rainy season and some inter-state roads are also in bad shape.

Most past studies in Nigeria approached marketing studies using the structure-conduct performance (S-C-P) model. For instance, Girei, Dire and Bello (2013); Musa, Iheanacho and Nyiatagher (2018) and Abiyong, Bidoli and Nyiatagher (2019) employed the S-C-P model in their studies on marketing of livestock/livestock products (cattle, and pig). The S-C-P model has often been criticized for being too abstract and deterministic. This study therefore, used a synergy of approaches which included S-C-P framework, commodity chain and transaction cost economics approaches to circumvent the individual analytical limitations of each model. The study also determined the risk factors in the cattle marketing business and developed a scale that could be used during the insured process in different states of North-central Nigeria. This is the research gap the study intended to fill.

Objective of the Study

The broad objective of the study is to analyse cattle marketing and risks among traders in North-Central Nigeria. The specific objectives are to:-

i. examine the socio-economic characteristics of intermediaries in cattle marketing in the study area,
ii. identify the cattle marketing channels and conduct of cattle marketers in the study area,
iii. analyse costs and returns associated with various intermediaries in the cattle value chain in the study area,

2.0 LITERATURE REVIEW

Theoretical Framework

Transactions Cost Theory

The transaction cost economics (TCE), unlike neoclassical economic theory, recognizes that transactions do not occur in a friction less environment (Coase, 1992). Costs usually incurred include cost of purchase of product and transaction costs, which can be further subdivided into information (ex-ante), negotiation, and, monitoring or enforcement (ex-post) costs (Williams, 1986).

Transaction costs include inter alia, the costs of searching for a partner with whom to exchange, screening potential trading partners to ascertain their trustworthiness, bargaining with potential trading partners (and in some cases officials who can hold up trade) to reach an agreement, transferring the product (typically involving transportation, processing, packaging and security title if necessary), monitoring the agreement to see if conditions are fulfilled, and enforcing (or seeking damages for validation of the exchange agreement (Staal, Delgado and Nicholson, 1997). Against the limitations of the commodity chain approach regarding institutions, it has been argued that institutions are efficient responses to transaction costs in that institutions emerge due to high assets specificity, high uncertainty, high level of transactional idiosyncrasy and high levels of opportunism (Marion, 1986).

Conceptual Framework

The following conceptual framework are discussed to guide the rest of the study:

Marketing

Agricultural marketing can be defined from both the micro and the macro viewpoints. The micro viewpoint is concerned with the individual participants in marketing be it the farmer or the business firm. The macro view point of marketing on the other hand is a "big picture" view. It examines the total system of economic activities concerned with the flow of agricultural products from the producers to the consumers, the kinds of institutions and the price making mechanisms that guide those flows (Olukosi *et al.,* 2007). Marketing is the performance of all business activities involved in the flow of goods and services from the point of production until they are in the hands of the ultimate consumer. A market is classified on the basis of certain factors such as: number of firms or sellers of a particular product, the firm's degree of control overprice and degree of product differentiation.

Market Participation

Market Participation is one of the key concepts in agribusiness management as has been defined differently by various authors. It is regarded as participation in any market related activity which encourages the sale of produce, as the individual farming household's economic transactions with others in cash or kind or commercialization (Adeoti, Oluwatayo and Raheem, 2014). Market participation is also viewed as the integration of subsistence or semi-subsistence farmers into the inputs and outputs markets of agricultural products, with the aim of boosting their income level resulting in poverty reduction (Jagwe, Machethe and Ouma, 2010).

Market Channel

A market channel is simply the pathway through which a commodity moves from its raw state or form to the finished product or the pathway of a product as it moves from the producers to the final consumers (Harriss, 1979) and (Hays, 1975). Marketing channels are important in evaluating marketing system because they indicate how the various market participants are organized to complete the movement of the product from the producer to the final consumer (Harriss, 1979). Marketing channel, according to Olukosi, Isitor and Ode (2007), is categorized as centralized and decentralized channels.

Market Conduct

Market conduct refers to the actions which market participants can take out of their own discretion or pattern of behavior which they follow in adopting or adjusting to the market in which they buy and sell (Jagwe, Machethe and Ouma, 2010). The most important parameters used in assessing market conduct in this study are:

i. Exchange functions,
ii. Methods of determining price (i.e. Price determination),
iii. Product differentiation.

Review of Related Empirical Studies

Girei, Dire and Bello (2013) examined the effects of the socio-economic characteristics of cattle marketers on cattle marketing in central Adamawa State, Nigeria. The study revealed that 100% of the respondents were male. The dominance of male in the business, may be attributed to the peculiarity of the location of the study area, and similarly could be associated with its tradition, culture and belief which restrict the female gender from participation in certain activities and thus classified some categories of activities or task to either male or female.

Mafimisebi, Bobola and Mafimisebi (2013) in their study on the Fundamentals of cattle marketing in Southwest Nigeria revealed that majority (87.5%) of sampled respondents were males while only 12.5% were females. This shows that the male sex dominates cattle marketing activities in the study area. This is however not surprising considering the rigorous work involved in cattle marketing and the resultant stress to market participants. Thus, only active and strong women who are physically strong are able to cope with the operations in cattle marketing will dare to take part in cattle marketing.

Ayele, Zemedu and Gebremdhin (2017) classified chain actors as direct chain actors and indirect actors. Direct chain actors are commercially involved in the chain such as producers, wholesalers, retailers and consumers. Indirect actors provide financial or non-financial support services. The direct actors identified in the area along the commodity chain were producers, small traders, large traders, small-scale feedlot operators, butchers and other farmers who purchased for draft purposes.

Ayele *et al.* (2017) stated that butchers are the final links before the consumers along the commodity chain. They purchased 17% of total sales by producers, 18.8% of total sales by small traders, and 91% of the total sales by small

feedlot operators. Farmer traders purchased heifer and young bulls for breeding and replacement purposes from farmers either at farm gate or Woreda (district) market place. The oxen were usually castrated and were used for draft purpose. They purchased oxen from farmers and small traders either at farm or Woreda (district) market place. The oxen were usually castrated and were used for draft purpose. They purchased oxen from farmers and small traders either at farm or Woreda (district) market for draft purpose (Ayele *et al.,* 2017).

Girei, Dire and Bello (2017) identified the constraints associated with cattle marketing in the study area to include: capital, transportation, access road, inadequate information about the market, inadequate infrastructure facilities such as shades for both marketers and the animals, watering points for both human and animal consumption and security. Constraints generally refer to the bottlenecks, problems or impediments that affect the smooth conduct of any given operation or activities. Analysis of the constraints experienced by the marketers in the study area revealed that 24.4% of the respondents indicated inadequate capital as their major problem, 15.6% reported high transportation cost, 11.1% complained of fluctuations in demand, 8.9% complained of inadequate market information while 7.9% indicated security/insecurity problem. Other constraints were lack of shade/inadequate market infrastructure (12.2%) and buying of stolen animals (12.2%).

3.0 METHODOLOGY

Research Design

The study used descriptive research design. This design involved using a range of qualitative and quantitative research methods to collect data that aided in accurately describing the research problem.

The Study Area

This study was conducted in North-Central Nigeria. It is one of the six geo-political zones of Nigeria. The zone comprises Benue state, Nassarawa state, Kogi state, Kwara state, Niger state, Plateau state and the Federal Capital Territory (FCT). This zone has a population of 26,650,128 and spans an area of 226,416 km^2 (87,419 mi^2) (NPC, 2022 estimate).

Population of the study

The population of the study comprised all the number of intermediaries in the different categories of cattle markets using registers of members kept by leaders of cattle market association in North Central Nigeria. The total population of cattle market intermediaries from the study area was 2800. (Cattle Market Association Register of Members). The population of the study comprised 1456 wholesalers, 992 retailers and 352 brokers who were intermediaries in cattle marketing from Benue, Nasarawa, Kwara, Niger States and the Federal Capital Territory (FCT).

Sample and sampling technique

Multi-stage sampling was used in this study. In the first stage, four (4) states and the Federal Capital Territory (FCT) were purposively selected for this study. The states included: Benue state, Nasarawa state, Kwara state and Niger state. This was based on proximity, accessibility and intensity of cattle marketing in the states and the FCT. In the second stage, five cattle markets were purposively selected as the locale for this study. The five cattle markets included Makurdi cattle market, Lafia cattle market, Ilorin cattle market, Minna cattle market and Abuja cattle market. This was also based on proximity, accessibility and the intensity of cattle marketing activities in the state capitals and Abuja. In the third stage of sampling, stratified random sampling based on the number of wholesalers, retailers and brokers size is used after obtaining the estimated number of intermediaries in the different categories after stratification of the population using registers of members kept by leaders of cattle market associations.

In the five cattle markets which were selected for data collection, three hundred and fifty (350) respondents were interviewed. Taro Yamane formula was employed to arrive at the sample size of 350 (from the total population of 2800 intermediaries). The sample comprised 182 wholesalers, 124 retailers and 44 brokers (see Table 1).

The statistical formula devised by Taro Yamane is as follows:

$$n = \frac{N}{1+N(e)^2} \quad \text{---------- (1)}$$

Where n = the required sample size from the population under study

N = the whole population that is under study = 2800

e = the precision of sampling error = 0.05

$$\therefore \quad n = \frac{2800}{1+2800\,(0.05)^2}$$

$$= \frac{2800}{1+7}$$

$$= 350$$

Thus, respondents were selected using Bourley's formula to allocate the samples to the different intermediaries in the different states as follows: 60 respondents from Makurdi cattle market, 65 respondents from Lafia cattle market, 40 respondents from Ilorin Cattle market, 80 respondents from Minna cattle market and 75 from Abuja cattle market (see Table 1).

Table 1: The breakdown of the sample by type of intermediary.

State	Market	Wholesalers	Retailers	Brokers	Total
Benue	Makurdi	35	20	5	60
Nasarawa	Lafia	30	25	10	65
Kwara	Ilorin	32	26	12	70

Niger	Minna	40	30	10	80
FCT	Abuja	45	23	7	75
		182	**124**	**44**	**350**

Source: Reconnaissance Survey, 2022.

Instruments of Data Collection
Data were collected through direct personal interview with structured questionnaire on socio-economic characteristics of the respondents, marketing channels, costs and returns, factors considered important in price formation, risks associated with cattle marketing and constraints faced during marketing of cattle in the study area.

Validation of the Instrument
The questionnaires were distributed to experts and authorities in the Departments of Agribusiness and Agricultural Economics at Joseph Sarwuan Tarka University Makurdi for assessment and inputs. This helped to determine its validity (extent to which it could measure what it was expected to measure).

Reliability of the Instrument.
The instrument's reliability test was determined using test-retest method. The questionnaires were administered twice to the same group of 20 respondents (cattle marketing intermediaries) after an interval of two weeks. A correlation coefficient of >0.65 was obtained it which was an indication of the reliability of the research instrument. Its posited in literature that an instrument is regarded as reliable if the Cronbach alpha co-efficient is greater than 0.5 (www.scien cedirect.com).

Method of Data Collection
Primary data were used in this study. The primary data were collected through direct personal interview with a structured questionnaire. Information were on socio-economic characteristics of the respondents, marketing channels, costs and returns, factors considered important in price formation, risks associated with cattle marketing and the constraints faced by cattle market intermediaries in the study area.

Data Analysis Techniques
Descriptive statistics was used to analyze the socio-economic characteristics of the respondents (objective i). Aspects of descriptive statistics which were used included mean, percentage and tables. Charts and flow diagrams were used in presenting the different marketing channels and intermediaries (objective ii). Budgeting technique adopted from Folayan *et al* (2007) was used to determine the margin of wholesalers, retailers and brokers (objective iii).

4.0 RESULTS AND DISCUSSION

Objective One: Examine the socio-economic characteristics of intermediaries in cattle marketing in the study area

Socio-Economic Characteristics of Respondents
The importance of socio-economic characteristics of the respondents in cattle marketing study cannot be over emphasized as it revealed gender, age, marital status, level of educational attainment, cattle marketing experience, household size, source of capital for financing cattle marketing activities, primary occupation and annual income of market participants.

Table 2: Distribution of Respondents

Item	Frequency	Percentage (%)	Mean
Male	350	100	
Female	0	0	
Total	**350**	**100**	
Age (years)			
≤ 3	36	10.3	
31-40	71	20.3	
41-50	118	33.7	46.2
51-60	84	24.0	
>60	41	11.7	
Total	**350**	**100.0**	
Marital status			
Single	16	4.6	
Married	304	86.9	
Divorce	12	3.4	
Widowed	18	5.1	
Total	**350**	**100.0**	
Educational Status			
No formal Education	105	30.0	
Primary/Nomadic Education	94	26.9	
Secondary School Education	87	24.9	
Tertiary Education	64	18.2	
Total	**350**	**100.0**	

Source: Field Survey, 2022

Table 2 showed the sex (gender) distribution of the respondents in the study area. It was discovered that all the respondents were male (100%). The dominance of male in the cattle marketing business is however not surprising considering the rigorous work involved in cattle marketing and the resultant stress to market participants. The dominance of male in the cattle marketing business may also be attributed to the peculiarity of the location of the study area and similarly could be associated with tradition, culture and belief which restrict the female gender from participation in certain activities and thus classified some categories of activities or tasks to either male or female. This finding is in agreement with the study

by Girei *et al* (2014) and Ayele *et al.* (2017) who found that all (100%) of cattle market participants in their study areas were male. This finding is however in disagreement with the study by Mafimisebi *et al.*(2013) who found that 87.5% of sampled respondents were males while only 12.5% were females in their study on fundamentals of cattle marketing in South-West, Nigeria.

Age of the Respondents

Results shown in table 3 revealed that the percentage of respondents within the age bracket of 41-50 years formed the majority of respondents (33.7%). Those within the age of bracket of 51-60 years constituted about 24% while those in the age bracket of 31-40 years accounted for about 20.3%. Respondents with age less than 30 years formed about 10.3% of the sample. Those whose ages were over 60 years took about 11.7%. The summary descriptive statistics of age revealed that the average age of the respondents was 46.2 years with a modal age of 46 years. This shows that majority of the respondents are still young and within the active working age. This is expected to influence their productivity and efficiency in the rigorous and energy sapping cattle marketing business. This finding agrees with those of Mafimiseti *et al.* (2013) and Ayele *et al.* (2017) who found that average age of cattle market participants in their study areas was 47.3 years and 41 years respectively (that is the average age of the participants fell in the age group 41-50 years). In marketing studies, the age of the respondents in an important factor as it may impinge on the level of efficiency of an individual market participant. It is logical to think than an individual's performance efficiency or productivity declines with the increasing age (Mafimisebi *et al,* 2013).

Marital Status of the Respondents

Data presentation in table 4 revealed that about 86.9% of the respondents were married, about 5.1% were widowed, about 4.6% were single while close to 3.4% were divorced. It can be inferred that since majority of the respondents were married, they have social obligations to cater for at the household level and this may cause them to take their involvement in cattle marketing activities very seriously in order to raise the income required to meet their financial obligation. This finding is in consonance with those of Mafimisebi *et al.* (2013) and Gerei *et al.* (2014) who also found that majority of the cattle market participants (89.2% and 73.3% respectively) were married. The marital status of a person determines the degree of responsibility of that person in the society and the manner in which he will judiciously allocate the scarce resources at his disposal (Mafimisebi *et al;* 2013).

Educational Attainment of Respondents

Table 5 revealed that about 30.0% of the respondents had no formal education, 26.9% had primary/nomadic education, 24.9% had secondary education while 18.2% had tertiary education. Altogether, about 70% of the respondents had one form of formal education. This is a desirable development as it will enhance the adoption of new innovations (marketing strategies), provide readability consciousness and awareness all of which can enable taking of business that will enhance market performance. This finding is in consonance with those of Mafimisebi *et al.* (2013) and Girei *et al.* (2014) who also found that majority (68.0% and 51.1% respectively) of the cattle marketing participants in their study areas had one form of formal education or the other.

For most people and societies, formal education confers a wider range of opportunities and advantages for success in life compared with illiteracy. This is why formal education is seen as capable of liberating a person from ignorance, harmful practices and poverty (Mafimisebi *et al,* 2013). It is expected that higher levels of educational attainment by a market stakeholder, may lead to a better understanding of the market dynamics and thus better profit from use of sound business principles and wise business decisions. The level of formal education will for instance have an implication on the extent to which cattle marketers will be proactive in marketing and receptive to new innovations, which can increase profitability.

Years of Experience in cattle marketing

Table 6 showed that about 10.0% of the respondents had marketing experience of 5 years and below, 21.4% had between 6-10 years, about 22.0% had 11-15 years, about 20.0% had 16-20 years while 26.6% had above 20 years of cattle marketing experience. Thus about 68.6% of the marketers had cattle marketing experience of more than ten years. From this distribution, one may think that majority (about 69%) of the respondents are expected to have mastered the skills required for success in their cattle marketing business considering their long years of marketing experience. The data presented further revealed that the average marketing experience of cattle marketers in the study area was 14.6years. This finding agrees with those of Mafimisibi *et al.* (2013) and Girei *et al* (2014) who reported average cattle marketing experience of 15.5years and 17 years respectively for their study areas. Experience plays very important role in every human endeavor. It is the basis of success and progress in business (Mafimisibi*et al.,* 2013). In the presence of a lack of experience, the timely outcomes have been shown to be low production and income for farmers/marketers. It is generally believed that the more experience a market participant have in marketing, the greater efficiency of that individual.

Objective two: identify the cattle marketing channels and conduct of cattle marketers in the study area.

This study revealed three types of intermediaries who were found to be very important in cattle marketing in the study area. These included wholesalers, retailers and brokers. The wholesalers are the marketers who source for cattle from the markets in northern Nigeria (especially North-West and North-East Nigeria), assemble and transport the cattle to the North-Central markets. The wholesalers were found to be mostly active between the ages of 40 – 55 years. They are very influential in the cattle marketing setting because of the large amount of capital that is required to operate at this level.

They are well travelled and known to pastoralists/local assembly men and transporters in the northern states of Nigeria. This finding confirms the information provided by respondents on the level of influence wielded by the wholesalers in the cattle marketing business. This finding is in consonance with that of Mafimisebi *et al*. (2013) who also found that the wholesalers command a lot of respect and influence in the cattle marketing business in South-West Nigeria. The cattle marketing channels (movement of cattle from the pastoral producers in the North to the final buyers in North-Central Nigeria is in Figure 2).

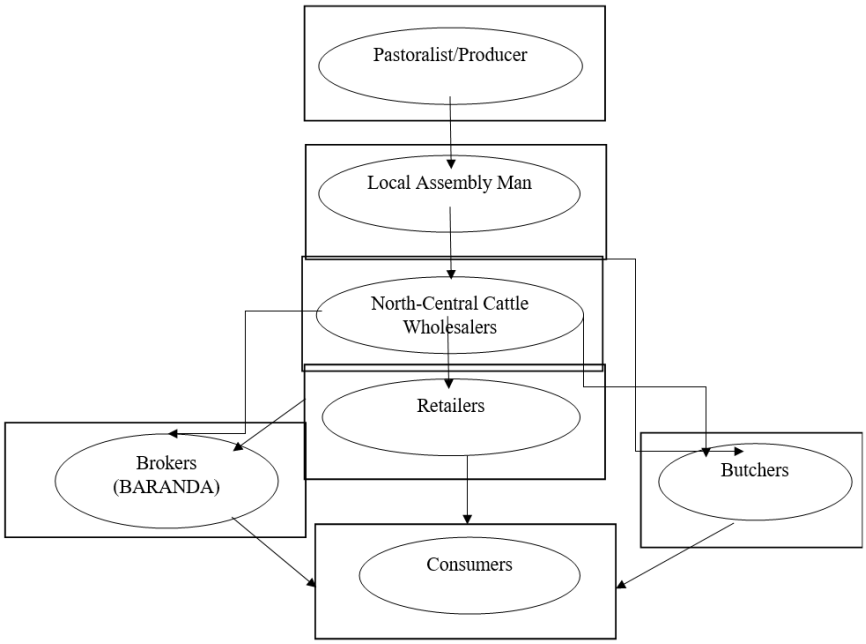

Figure 2: *Cattle Marketing Channels in North-Central Nigeria.*

The retailers are traders in the North-Central market kraals (enclosure for cattle). Majority (>75%) of retailers buy cattle from the wholesalers. The study revealed that retailers may have anything between 5 – 15 cattle in their stock at any particular time. About 20% of retailers reported associating themselves with wholesalers to sometimes make trips to the northern states of Nigeria to purchase cattle while 80% usually get their cattle from the wholesalers and never travel to the northern states of Nigeria to source cattle. The study found that majority of the retailers were formerly wholesalers who, owing to aging, can no longer afford the stress and risk of travelling the long distance to the northern states of the country to purchase cattle. A few (15%) of the retailers were retirees, who have reasonable capital, from their retirement benefits thus affording them the capital required to operate at this level of cattle marketing. The ages of retailers ranged from 50 – 75 years. The retailers were responsible for distributing cattle to the operators of butcheries, local traders and directly to the final consumers who need between one to five animals for restaurant business or for social occasion. This finding is in agreement with those of Girei *et al.*(2014) and Ayele *et al.* (2017) who found that retailers usually operate in the primary beef markets, buy up to 5 – 8 cattle on a given marketing day using their own capital or big traders' money and they have trade ties with affiliated large traders (wholesalers).

Table 11: Distribution of Respondents based on Type of Vehicle Used

Vehicle type/cattle capacity	Frequency	Percentage (%)
Long trailers (30 – 45)	110	60.4
Trucks (15 – 20)	30	16.5
Mitsubishi Canters (10 – 15)	42	23.1
Total	**182**	**100.0**

Source: Field Survey, 2022

Transportation of Cattle

The study revealed that majority of the cattle traded in the study area were brought from the northern states of Bauchi, Borno, Jigawa, Kaduna, Kebbi, Katsina, Sokoto, Zamfara, Adamawa and Gombe states. The main mode of transport used in conveying cattle from the northern states to the North Central states was by road. This may be due to the absence of rail link to most of the origin markets in the North and to North Central Market Kraals. Results from table 11 showed that vehicles used include the long articulated trailers, lorry trucks and Mitsubishi canters with respective capacities of 30 – 45, 15 – 20 and 10 – 15 cattle per load. The choice of vehicle type depended on the number of cattle to be transported. They study revealed that 3 to 5 wholesalers purchasing cattle from the same market location could join together to hire the articulated trailers and share the cost. The cattle were usually branded with unique marks for easy identification of ownership.

Objective three: analyse costs and returns associated with various intermediaries in the cattle value chain in the study area.

Table 13: Cattle Wholesalers' Costs, Returns and Profit

S/N	Item	Quantity	Unit Price ₦	Total Price ₦	Net Value ₦
1	Number of cattle heads	112	92500	10360000	
2	Attendants	3	20120	60360	
3	Intermediate input and services.				
	a. Feeds (₦)			32014	
	b. Water (₦)			13292	
	c. Transport (₦)			423869	
	d. Veterinary cost (₦)			12670	
4	Other costs (₦)				
	a. Association fees (₦)			4017	
	b. Taxes (₦)			65696	
	c. Loading and offloading fees (₦)			80312	
	Total (₦)			**11052230**	
	Total Revenue (₦)	**112**	**133740**	**14978880**	
	Gross Margin (₦)				**3926650**

Source: Computed from Field Survey, 2022

Table 14: Cattle Retailers' Costs, Returns and Profit

S/N	Item	Quantity	Unit Price (₦)	Total Price (₦)	Net Value (₦)
1	Number of cattle heads	130	102100	13273000	
2	Attendants	2	18150	36300	
3	Intermediate input and services.				
	a. Feeds (₦)			28090	
	b. Water (₦)			10980	
	c. Transport (₦)			226200	
	d. Veterinary cost (₦)			21412	
4	Other costs (₦)				
	a. Association fees (₦)			2485	
	b. Taxes (₦)			16950	
	c. Loading and offloading fees (₦)			22430	
	Total (₦)			**13637847**	
	Total Revenue (₦)	**130**	**138350**	**17985500**	
	Gross Margin (₦)				**4347653**

Source: Computed from Field Survey, 2022

Table 15: Cattle Brokers' Costs, Returns and Profit

S/N	Item	Quantity	Unit Price (₦)	Total Price (₦)	Net Value (₦)
1	Number of cattle heads	14	110800	1551200	
2	Intermediate input and service				
	Feeds (₦)			2025	
	Water (₦)			1165	
	Transport (₦)			3860	
	Veterinary cost (₦)			2790	
	Total (₦)			**1561040**	
	Total Revenue (₦)	**14**	**142300**	**1992200**	
	Gross Margin (₦)				**431160**

Source: Computed from Field Survey, 2022

The costs and returns items of cattle marketing for wholesalers, retailers and brokers are presented in table 13, 14 and 15. There was no fixed cost item because traders did not own either a warehouse or a truck. Most of their expenses were restricted to the operational costs of maintaining the animals in terms of supplementary feeding before final conveyance to the distant markets as well as taxes/levies paid in transit and thus only gross margin could be calculated. Adegeye and Dittoh (1985), Mafimisebi *et al.* (2013) and Ayele *et al.* (2017) indicated that gross margin is a good measure of profitability. The budgeting model was based on the average values reported by all the marketers sampled in each category (wholesaler, retailer and broker).

Tables 13, 14 and 15 showed that all the various categories of marketers were able to cover their total variable cost of marketing and earned a fair level of returns. The variable costs included labour, feeding, water, transportation, veterinary services, association fees, taxes and loading and off-loading charges. The average cost per head of cattle N92500, N102100 and N110800 for cattle wholesalers, retailers and brokers respectively. The average selling price per head of cattle was N133,740; N138350 and N142,300 for wholesalers, retailers and brokers respectively. This gave gross margins of N35059.38, N33443.48 and N30797.14 per head of cattle for a wholesaler, retailer and broker respectively. Thus the study revealed that cattle marketing business is profitable in the study area.

5.0 CONCLUSION AND RECOMMENDATIONS

Conclusion

Cattle marketing in North Central Nigeria is profitable. The total marketing costs of each intermediary indicates that wholesalers have incurred the highest costs followed by retailers and brokers. The most significant cost was transportation cost. To create efficient marketing system in the study area, improving marketing information, market infrastructure, access to credit and upgrading or adding value are crucial. These improvement actions will raise the traders' income and bargaining power of producers that could improve their income and getting a larger share of consumers prices. It is important to encourage shorter channels in order to enhance the benefit of producers.

Recommendations

Emanating from the major findings are the following recommendations:

i. Credit support institutions to facilitate cattle marketing should be provided in the study area.
ii. Banking services should be improved in terms of efficient money transfer
iii. Illicit rate of taxes/levy in transit should be reduced.
iv. Provision of good means of transporting cattle like the possibility of using trains.
v. Formation of viable associations among the cattle traders should be encouraged.

Contribution to Knowledge

This study on analysis of cattle marketing and risks among traders in North Central Nigeria revealed that cattle marketing business is profitable in the study area. The gross margin per head of cattle was highest among the wholesalers due to the fact that the major value added in cattle marketing was transportation. To create efficient marketing system in the study area, improving market information, market infrastructure, access to credit and upgrading or adding value are crucial.

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