

Analysis of Market Performance of Small Ruminants in Gombe State Nigeria

Abdullahi Saleh^{1, *}, Yau Adamu¹, Isiaka Mohammed², Kubra Hamidu¹, Shuaib Yau¹, Mohammed Hussaini Sani²

¹Department of Agricultural Economics and Extension, Federal University, Kashere, Nigeria

²Department of Agricultural Economics and Extension, Abubakar Tafawa Balewa University, Bauchi, Nigeria

Abstract

The study examined the marketing performance of sheep in Gombe metropolis. A multi-stage sampling technique was used to select 91 sheep marketers from four markets. Data were collected using structured questionnaire and were analysed using descriptive statistics, farm budget, maximisation of consumer satisfaction and multiple regression models. The results revealed that, the mean age of sheep marketers was 40.59 years, 96.70% were males, 86.81% were married, with the majority (87%) had family size ranging from 1 – 20 persons, and had 17.68 mean years of experience. Furthermore, the result revealed that purchasing cost for live animal constituted 92.08% of the total marketing costs. Moreover, the result revealed average net income of ₦ 4,922.46 (\$ 13.78) per head of animal was realised; with the gross and operating ratios < 1; meaning that the business was profitable. Also, the returns per naira/dollar invested was ₦ 0.18 (\$ 0.00050). Also, the marketing coefficient (38.89%) of *Tike-Jauro-Abare market*, revealed to be most efficient. The coefficient of multiple determinations (R^2) was 0.821; meaning that 82.10% variations in the total returns of sheep marketers were influenced by the socio-economic characteristics included in the regression model. The result also revealed that, number of animals held per week was significant ($P < 0.01$). Inadequate capital was critical; which was attributed to inadequate sources of credits. Market facilities such as clean environment and security were also lacking. However, improvement in the existing infrastructural facilities will help promote expansion of the present scale of operations. Governments and other financial institutions should do more to extend funds as soft loans to the marketers to improve efficiency.

Keywords

Market, Performance, Profit, Efficiency, Sheep, Marketing, Gombe

Received: April 4, 2018 / Accepted: May 7, 2018 / Published online: March 6, 2019

@ 2018 The Authors. Published by American Institute of Science. This Open Access article is under the CC BY license.

<http://creativecommons.org/licenses/by/4.0/>

1. Introduction

The demand for sheep and their products is destined to increase by more than 250% in Sub-Saharan Africa, especially the West Africa [1]. This was because of the population growth, accelerated urbanisation, incomes generation and consequently increased purchasing power of the populace. In economic terms, small ruminant rearing plays a major role in household incomes. With regards to

poverty reduction; reference [2] reported about 11.25% of world's rural inhabitants are entirely or partially dependent on small ruminant's production to feed them or obtain financial remuneration. According to [3], small ruminants are reared for various reasons such as income generation, religious and social festivities, households' consumption, hobby and as well as security against crop failure. Most of small holder farmers in Gombe State raised sheep and goats as major sources of meat and immediate cash income [4]. Reference [5] reported that, small ruminants' production is

* Corresponding author

E-mail address: abdullahisaleh@fukashere.edu.ng (A. Saleh)

important due to the fact that sheep and goats are easily managed, that require a relatively small initial investment and their short generation interval lends itself to a fast return to investment. Sheep and goats also serve as important store of wealth and insurance; a function that is extremely important in the absence of well-developed rural financial markets and gave significant covariate risk due to climate, civil unrest, and epidemiological shocks. Sometimes the animals are consumed directly, but more often, are sold; where the proceeds are used to purchase grains and to settle for other bills [6]; [7]. Moreover, small ruminants have often been found to be superior to saving money in the bank, because their net annual returns are much higher than the interest realised from banks' savings [8]. The ultimate goal of intervention aimed at enhancing productivity of small ruminants, needs to consider the market aspect simultaneously [9]. Therefore, farmers need to be aware of the preferred characteristics of the animals as well as price patterns so that they can adequately plan for breeding and fattening programs consistent with the best seasonal prices and consumers' preference [10]. In Nigeria, sheep production and marketing are private owned investments, and had been categorised into three, those that are mainly; collection market that serve the function of transferring slaughter stock and live animals from production regions to consumption regions. The other two are described as urban and local consumer markets respectively [11]. Reference [12] opined that, marketing system must provide information flows from the consumer back to the producer through some physical and facilitating functions. The producer responds to the price signals by producing commodities in relative quantities dedicated by prices and costs. An important aspect of production and its response to demand and supply is knowledge of markets and marketing systems. Good marketing system reduces the marketing costs, ensures high returns to the producers, provides good quality of agricultural produce at affordable price to the consumers and minimises the number of intermediaries [13]. The performance of agricultural markets has long been recognised by economists, planners and policy makers as a critical component in the development process [14]. According to [15], market performance is how successfully the firm's aims are accomplished, which shows the assessment of how well the process of marketing is carried out.

However, the marketing of sheep and their products is underdeveloped due to traditional management systems which are not market oriented, poor marketing systems, poor infrastructures, poor financial facility and presence of cross-border trade [16]. Some of these factors are particularly more pronounced in distant areas away from large cities and urban centres which are associated with taxation, lack of market

information, intermediate costs and cartels. Also, too many middlemen affect the efficiency of the sheep markets. In most traditional markets; the live animals may change hands two to six times until they terminal markets [17]. Even then, the final transaction in the terminal markets is also carried out through series of middlemen on commission basis. At these points, prices end up three or four times higher than the producer's price [18]. Therefore, it is worthwhile study to small ruminants' value chain, to provide information that looks into the possible ways of increasing producers' and traders' income through accumulating capital and enhancing productivity. To this effect, the study is therefore sought to provide answers to the following research questions;

- i) what are the socio-economic characteristics of sheep marketers in the study area?
- ii) what are the costs and returns of sheep marketing in the study area?
- iii) what is the marketing efficiency of sheep markets in the study area?
- iv) what are the constraints to sheep marketing in the study area?

2. Methodology

2.1. The Study Area

Gombe metropolis is the main commercial centre of Gombe State Nigeria. It serves as the state capital and as well as the Headquarters of Gombe Local Authority. Situated on longitude 11° 10' E and latitude 10° 17' N; shares common boundaries with three local government areas of the state; Akko to the south-west, Yemaltu-Deba to the east and Kwami to the north-west; covering an area of 5,200 km² [19]. It is located in the Sudan Savannah region with predominantly grassland vegetation that is interspersed by tributaries of the Upper Benue river basin; a feature that supports livestock production and arable farming; enhanced by economic networks with other states [20]. The study area is characterised with a warm climate, having a mean diurnal temperatures of 35°C to 40°C during the hottest months of (March to May) and to about less than 30°C during harmattan. The area has two distinct seasons based on the amount of rainfall received; the dry season (November to April) and the wet/rainy season (May to October) with an average (850 mm) amount of rainfall received per annum in 110 to 125 days. According to [21], Gombe metropolis had human population of 268,536 in 2006, with annual growth rate of 6.79% (between 2006 and 2017), and had a projection of 505,573 people by 2018. It is a multi-ethnic town, constitutes mainly of Fulani, Tera, Bolewa, Tangale and Kanuri and other ethnic groups such as; Waja, Tula, Jara, Yoruba and Igbo with Hausa as the inter-tribal medium of

communication. The inhabitants of Gombe metropolis are mostly traders, civil servants, small-scale farmers and other non-agricultural service providers. Industrial and other agrobusiness activities in the study area are in the form of medium and small scales, including the; ginnery, oil seeds milling, rice milling, table water production, leather works, fish and meat processing etc. [19].

2.2. Sampling and Sampling Procedure

2.2.1. Sampling Techniques

A multi-stage sampling technique was used to select 91 sheep marketers from the four major small ruminants' markets in the study area. In stage I, Gombe metropolis was purposively selected being the commercial centre of the State, and also assumed to have contained majority of the target population for the study. In stage II, the study area was delineated into two major sheep market districts; the Gombe-north and Gombe-south, and were purposively selected. In stage III, from each district, two markets; the *Tike-babba* and *Tike-jauro-abare*; the *Tike-pantami* and *Tike-nasarawo* were purposively selected from Gombe-north and Gombe-south respectively. The choice was based on their popularity in small ruminants marketing in the State. In stage IV a total of 91 sheep marketers were proportionately selected by simple random sampling technique. This ensures that every member of the population has equal and independent chance of being selected [22].

2.2.2. Sampling Frame and Sample Size

A sampling frame refers to the list of elements composing a target population from which the actual sample is selected [23]. The sampling frame for the study comprises of middlemen (wholesalers, retailers and brokers) drawn from the four sheep markets in the study area, having an estimated population of 456 participants. A sample size on the other hand entails a representation of the population, upon which observation is taken for obtaining information and to draw valid conclusions about the population [24]; and [25]. However, in determining the sample size appropriate for this study, the reference [26] model was used, where; 20% of the sample frame were chose. Also, for the purpose of this study the proportion of the respondents from each market was determined using the formula below, as adopted by [27].

$$ni = \frac{(p)*n}{N} \quad (1)$$

where;

n_i = proportional ratio to the estimated population in each market,

N = estimated population size,

n = sample size,

p = population proportion of each market.

Table 1. Sampling procedure.

Districts	Markets	Sampling frame	Sample size
Gombe-north	<i>Tike-babba</i>	209	42
	<i>Tike-jauro-abare</i>	74	15
Gombe-south	<i>Tike-pantami</i>	116	23
	<i>Tike-nasarawo</i>	57	11
Total		456	91

Source: Reconnaissance survey, 2017

2.3. Data Collection Techniques

Data for this study were collected from the primary sources using structured questionnaires; and was supported with personal interview in situations where the respondents did not understand the questions. Also, an informal *in situ* interviews noting responses and observing the marketing process was simultaneously done with the formal questionnaire administration. This allowed for generation of qualitative information which were not captured in the questionnaire. The questionnaire consisted of coded questions made to collect information on sheep marketers' personal and socio-economic characteristics, the marketing variables and as well as the constraints associated with sheep marketing in the study area.

2.4. Data Analysis Techniques

The kind and choice of analytical tools appropriate for the study, depends on the stated research questions, reliability of the tools and as well as the availability of data [26]. In this study, both the descriptive and inferential statistics, the farm budget model and maximisation of consumer satisfaction approach (MCSA) were used to analyse the data.

2.5. Model Specification

a) *Descriptive statistics*; this was used to achieve the research questions for the study. The descriptive statistics (such as frequency distribution table, percentage, means and standard error of the means) are mathematical tools often used to describe the observed events [28]. However, the mean model and the standard error of the means used for the study were given below, as adopted by [29] and [30] respectively;

$$\bar{x} = \frac{\sum fxi}{\sum f} \quad (2)$$

$$S.E = \frac{\sigma}{\sqrt{n}} \quad (3)$$

where;

\bar{x} = Mean of grouped data

$\sum fxi$ = Sum of products of all variables and frequencies

$\sum f$ = Sum of all frequencies of variables

S.E = Standard error of the mean

σ = Standard deviation of a sample

n = sample size

b) *Farm budget model*; to achieve the second research question of the study; the farm budgeting model (FBM) was employed to estimate costs, returns, marketing margin and net profit in sheep marketing in the study area. Thus, the costs-return analysis as described by [31]; was determined by the following relationships;

$$TC = TVC + TFC \quad (4)$$

$$TR = P * Q \quad (5)$$

$$NR = TR + TC \quad (6)$$

where;

TC = Total marketing costs (₦),

TVC= Total variable costs (₦),

TFC = Total fixed costs (₦),

TR = Total return (₦),

NR = Net return (₦),

P = Unit price of sheep (₦),

Q = Number of sheep sold per week.

However, the fixed cost components included the depreciation on fixed assets; for the purpose of this study, the straight-line depreciation (SLD) method was used to determine depreciation value of each fixed asset, expressed as;

$$D = \frac{P-S}{N} \quad (7)$$

where;

D = Depreciation value of fixed asset (₦)

P = Original value of fixed asset (₦)

S = Salvage value (₦)

N = Number of useful years [27]

c) *Marketing margin analysis*; this was also used to further measure the market performance of sheep in terms of profitability and viability. Reference [32] described marketing margin as the difference between the price consumers pay and the price the producers get. Thus, the general and explicit formula for analysing total marketing margin as given by [33] and [34] is;

$$MM = \frac{CP-MP}{CP} * 100 \quad (8)$$

where;

MM = Market Margin (%)

CP = Consumer Price (₦)

MP = Market Price (₦)

d) *Profitability analysis*; the profitability indices such as the gross ratio, operating ratio and returns to naira (dollar) invested, were used to further ascertain the profit level of each enterprise and in different markets. According to [35], the profitability indices are specified as;

$$GR = TC:TR \quad (9)$$

$$OR = VC:TR \quad (10)$$

$$R/\text{₦} = NI:TC \quad (11)$$

where;

GR = Gross Ratio;

OR = Operating Ratio;

R/₦ = Returns per naira

NI = Net Income (₦)

VC = Variable Cost (₦)

e) *Regression analysis*; this was used to further achieve research question one of the study; to describe the relationship between selected socio-economic variables and the net income. The model was used to measure the degree, cause and effect relationship between the variables; hence, the coefficient of determination (R^2) showed the level of variation in the dependent variable (Y), which is explained by variation in X_{is} (the independent variables). The model in its general form was specified as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, \dots, U_i) \quad (12)$$

While reference [36] gave the functional form of the model as;

$$Y_i = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + U_i \quad (13)$$

where;

Y = Estimated total return (TR) from the sales of sheep (₦),

X_1 = Age (years),

X_2 = Marital status (1 = married; 0 = otherwise),

X_3 = Household size (number),

X_4 = Initial capital (₦),

X_5 = Number of animals hold per week (number),

X_6 = Marketing experience (years),

X_7 = Level of education attained (1 = primary; 0 = otherwise),

U_i = Error term.

b_0 = constant

$b_1 - b_7$ = estimated regression coefficients

$X_1 - X_7$ = independent variables

U_i = error term

f) *Marketing efficiency*; the marketing efficiency is usually defined differently to suit one's conception. For instance, producers viewed marketing efficiency as selling of their animals at the highest price, while the consumers considered marketing efficiency as buying the animals at the lowest possible price. On the other hand, middlemen perceived efficiency as the process of making high profit. However, this study considered sheep marketing efficiency as the movement of live sheep from the producer to the buyer at the lowest possible cost consistent with the provision of the services that consumer is willing and able to pay for. According to [37], the marketing efficiency is the ratio of value addition for goods to their total marketing costs, expressed in percentage. This model is also called the maximisation of consumer satisfaction approach (MCSA) or price efficiency (E_p). The higher the ratio, the efficient the market is. This model was employed to achieve the third research question of the study. According to [38], the MCSA model is given in its explicit form as;

$$E_p = \left(\frac{\theta}{I}\right) * 100 \quad (14)$$

But;

$$\theta = CP - SP \quad (15)$$

where;

E_p = Marketing efficiency (%)

θ = Value addition (₦)

I = Total marketing costs (₦)

CP = Consumer/retail price of live sheep (₦)

SP = Supply/traders' cost price of live sheep (₦)

3. Results and Discussion

3.1. Socio-economic Characteristics of Sheep Marketers

Socio-economic variables play a vital role in marketers' life; hence help in improving their incomes and as well as standard of living [39]. The socio-economic characteristics of sheep traders considered in this study include the; age, gender, marital status, household size, initial capital, level of education, number of animals held per week and years of marketing experience among others. In marketing studies, the age of the respondents is an important factor as it may reflect the level of

efficiency of individual market participant. According to reference [40], age is a factor that influence traders' decision making in resource allocation, managerial ability and responsibilities. However, the result revealed the mean age of sheep marketers in the study area was 40.59 years (Table 2). This implies that sheep traders in Gombe metropolis were in their active stage and can take risks in anticipation of profit. Reference [40] obtained similar findings that mean age of cattle traders in Gombe metropolis was 42 years.

Gender is a term used to classify human beings into male and female biologically. Men are believed to be stronger than women. According to reference [41], gender is sensitive to certain occupation. It is a useful variable to analyse roles, responsibilities, constraints, opportunities and incentives of people involved in agricultural marketing. However, the traditional set-up of Gombe metropolis puts most of women indoor; with little or no roles to play in outdoor economic activities [42]. Table 2 shows that males were dominance (96.7%) in sheep marketing in Gombe metropolis. The result agrees with the findings of [30] who reported that sheep marketing in Dambam Local Government Area of Bauchi State was male dominance; also reference [43] reported that (100%) males dominated cattle marketing in Akko Local Government Area of Gombe State, Nigeria. Reference [44] opined that, men were more into agricultural marketing in most of the northern parts of the country than women, because of cultural and religious inclination. The high proportion of males to females is not surprising considering the stress involved in moving from village to village in search of live animals, which may be difficult for women to withstand and also, the belief that males were solely responsible for meeting the households' needs [45].

Marital status distribution is very important as it helps to have idea of marketing participant's devotion to the marketing process and the likely outcome of this on his/her business activities. Table 2 shows that majority (86.81%) of sheep marketers were married. This agrees with the findings of [46], who found that 73.3% of the livestock marketers in central zone of Adamawa State were married; implying that, the married traders' participation in marketing will ensure food security for their families. Reference [47] contended that, marriage is an important factor in the livelihood of individuals in the society as it is perceived to confer responsibility on individuals. He viewed also, married individuals have more responsibilities such as provision of foods, education, health and general well-being for the family.

Household size is an important socio-economic variable that determines availability of family labour supply [48]; and [49]. It is reasonable to think that the larger the number of household members, the more the social commitments of the working adults who have the responsibility of providing the

needs of the household. However, working adult depends on income from marketing activities to meet these social obligations; this can subsequently lead to more devotion to the income-generating activities they are engaged in. However, the results revealed that majority (86.81%) had household size range of 1 – 20 persons; with the mean household size of 13 persons per family (Table 2). The result agrees with the findings of [50] who reported that, the mean household size of most of marketers in northern Nigeria was 13 members per family. This implies that sheep marketers in Gombe metropolis had manageable family sizes which could add to them of extra helping hands in their ventures. Conversely, reference [51] reported that large family size of cattle traders in Jos Plateau State had negative consequences, as the family heads bear heavy burden, which greatly undermined their investment expansion capacity.

Level of education improves the ability of traders to make wise marketing decisions; for most people and societies, formal education confers a wider range of opportunities and advantages for success in life compared with illiteracy [52]. Table 2 depicts that sheep marketers with secondary education had the highest proportion (37.36%), closely followed by those that had other forms of education, such as *Islamiyah/Qur'anic* or adult/non-formal education (30.76%). Moreover, those with primary education constituted 21.98%, and only 9.9% that had tertiary education. It may be concluded that all sheep marketers in the study area had at least one or the other form of education. This implies that they could acquire skills and knowledge, which is important in obtaining information about marketing, thereby increasing their revenues.

Years of marketing experience are a measure of the period an individual marketer was involved; and plays a very important role in every human endeavour. It is the basis of skills acquisition and success in business [53]; and [54]. Also, Table 2 reveals the mean years of marketing experience was

17.68. This could infer that, the more the years of experience the less the number of traders. This might be due to the fact that, some of the traders dropped out of the business because of age or inability to take and manage risk associated with marketing of sheep in the study area. But, references [54]; [40]; and [55], all opined that, marketers with long years of marketing experience were likely to understand the market situation and then take and manage risks and uncertainties in marketing activities in an attempt to generate more profit. One may conclude that sheep marketing in the study area was stable, sustainable and dependable because people stayed in the business for quite period of time. By implication, the business seems to be profitable, because nobody will spend several years in an unprofitable enterprise.

Capital is one of the most important components of any investment [56]. It's availability and accessibility tend to have great influence in the marketing process. The result shows that majority (81.32%) of the marketers claimed to have sourced their initial capital from personal savings. The implication here is that majority of the marketers relied on informal sources of capital for financing their marketing activities. This was because the marketers were unable to cope with cumbersome procedures and high interest rates charged by most of the formal sources; and owing to inability to present acceptable securities required to obtain bank loans [57]; and [27].

The number of animals hold or supplied to the market depends on the market demand, trader's capital and as well as the market structure and location [58]. Table 2 also reveals the mean weekly number of animals supplied and sold was found to be 19 heads per trader. The findings further revealed that most of the sheep marketers in the study area were operating on subsistence level. This might not be unconnected with the difficulty in acquiring the required capital, resource inputs, seasonality in the supply and demand and as well as the speculative activities of middlemen [59]; and [60].

Table 2. Socioeconomic distribution of sheep marketers in Gombe metropolis.

Variables				Responses			
Characteristics	Unit	Range	Distribution	Frequency	%	S.E	
Age	Years	47	20 – 29	12	13.19	40.59	1.215
			30 – 39	36	39.56		
			40 – 49	25	27.47		
			50 – 59	09	9.89		
			60 – 69	05	5.49		
			70 – 79	04	4.40		
Household size	Number	31	1 – 10	39	42.86	13	0.751
			11 – 20	40	43.95		
			21 – 30	11	12.09		
			31 – 40	01	01.1		
			1 – 10	17	18.68		
			11 – 20	53	58.24		
Experience	Years	55	21 – 30	13	14.29	17.68	1.250
			31 – 40	05	05.49		
			41 – 50	03	03.3		
			1 – 10	22	24.18		
			11 – 20	50	54.95		
			No. of Animals	Number	40		

Variables			Responses				
Characteristics	Unit	Range	Distribution	Frequency	%	S.E	
Gender			21 – 30	06	6.59	19	0.886
			31 – 40	06	6.59		
			41 – 50	06	6.59		
			51 – 60	01	1.10		
			Male	88	96.7		
Marital Status			Female	3	3.3		
			Married	79	86.81		
			Divorced	1	1.10		
Educational Level			Single	11	12.09		
			Primary school	20	21.98		
			Secondary school	34	37.36		
			Tertiary school	09	09.9		
Capital Source			Others	28	30.76		
			Personal savings	74	81.32		
			Family and friends	10	10.99		
			Credit institutions	0	0.00		
			Money lenders	01	1.10		
			Coop. societies	01	1.10		
			<i>Adashe</i>	05	5.49		
Sample size (n)				91	100		

Source: Field survey, 2017

3.2. Profitability Analysis of Sheep Marketing in Gombe Metropolis

The results revealed the average total costs of marketing 19 heads of live animals was ₦ 488,388.72 (\$ 1,367.49). The results further revealed the average variable costs accounted for 92.08% of the average total costs of marketing live animals. The results agreed with [61] who conceptualised that, small-scale entrepreneurs' capital allocated to fixed inputs is low and sometimes negligible. In terms of returns; the average gross margin (GM) of ₦ 98,370.05 (\$ 275.44) was realised from the sales of 19 heads of live sheep. This further revealed the average net income of ₦ 4,922.46 (\$13.78) per head of live animal. The result concurred with [62], who found gross margins of ₦ 3,037 (\$ 8.50) as net income per head of goat in Benue State Nigeria. Moreover, sheep marketing in Gombe Metropolis was regarded profitable, as further confirmed by

the rate of returns to investment; where ₦ 0.18 (\$ 0.0005) were realised from every ₦ 1 (\$ 1) invested on a live sheep. Reference [63] and [30] both had similar finding and concluded that, small ruminants' marketing was a profitable venture in Nigeria. Moreover, Table 3 shows the marketing margin (0.2172); which further confirmed the profitability of the business in the study area. Implying that 1% increment in the purchase price of one sheep will virtually lead to increase in selling price by 21.72% of the live animal. Reference [64] admitted that 28.1% is effective means of getting the poor out of poverty, since it is above poverty lines. Table 3 also shows the positive and desirable gross and operating ratios of < 1; hence indicated the firms maintain their profitability status [35]. The result implied that, 85.05% and 84.23% of the total revenues give to pay for the total and variable costs of marketing live animals respectively.

Table 3. Profitability analysis of sheep marketing in Gombe metropolis, Nigeria.

Cost components	Elements				
Variable costs	Quantity	Unit	Amount (₦)	% of TC	
Supply cost of animals	19	Heads	488,388.72	92.08	
Variable marketing costs	-	-	37,151.06	7.0	
Total variable costs	-	-	525,539.79	99.08	
Fixed costs	-	-	-	-	
Depreciation on durable items	-	-	2,535.55	0.48	
Fixed marketing costs	-	-	2,307.71	0.44	
Total fixed costs	-	-	4,843.26	0.92	
Total costs	-	-	530,383.05	100	
Return components	-	-	-	-	
Sales of animals	19	Heads	623,909.84	-	
Gross margin	19	Heads	98,370.05	-	
Net return	19	Heads	93,526.79	-	
Marketing margin	-	-	0.2176	-	
Returns per naira	-	-	0.1763	-	
Gross ratio	-	-	0.8501	-	
Operating ratio	-	-	0.8423	-	

NB: ₦1 = \$0.0028

Source: Field survey data, 2017

3.3. Multiple Linear Regression Analysis

This model was used to measure and predict the degree, cause and effect relationship between socio-economic variables of the traders and the total returns realised from sheep marketing in Gombe metropolis. However, Table 4 shows the results of the linear function; the choice was based on a *priori* expectations in terms of magnitude and direction of the coefficients, magnitude of the coefficients of multiple determinations (R^2), and the overall performance of the model. The fitness of the model was confirmed by the absence of autocorrelation through the significance of the F-

value. The result revealed the coefficient of multiple determinations (R^2) as 0.821. Meaning that 82.10% variations in the total returns of sheep marketers were influenced by the socioeconomic characteristics of sheep traders. The F-ratio was significant ($P < 0.01$), meaning that the independent variables have adequately described the dependent variable included in the model. Moreover, the result further revealed that, only number of animal held per week that was significant ($P < 0.01$). Meaning that unit increase in the level of supply of animals in the study area would lead to unit increase in total returns [65].

Table 4. Effect of Socio-economic characteristics on total returns of sheep marketers.

Variables	Coefficients	Standard error	t-values
(constant)	25,584.968	4,864.119	5.260***
Age (X_1)	80.325	154.450	0.520
Marital status (X_2)	1,304.893	2,199.662	0.593
Household size (X_3)	43.598	176.058	0.248
Initial capital (X_4)	0.001	0.004	0.176
Number of animals held (X_5)	167.735	73.456	2.285***
Marketing experience (X_6)	103.227	183.076	0.564
Level of education (X_7)	1,290.622	834.029	1.547
R – square	0.821		
F – value	273.7***		

* $P < 0.1$; ** $P < 0.05$; *** $P < 0.01$ level of significance

Source: Field survey data, 2017

3.4. Marketing Efficiency of Sheep in Gombe Metropolis

Reference [66], viewed marketing efficiency as the degree of market performance, thus; a market that is efficient does not only bring sellers and buyers together, but also enables them take advantage of opportunities to innovate and improve in response to demand and price changes [67]. Table 5 shows market efficiency of 39.89% was estimated for *Tike-Jauro-Abare* market (the highest), while *Tike-Pantami* market recorded 35.20% market coefficient (the least). Other markets; the *Tike-Babba* and *Tike-nasarawo* markets have recorded 38.40% and 38.80% marketing coefficients respectively. However, the mean marketing efficiency of sheep markets in the study area was 37.84%. Implying that, on the average, sheep marketer in Gombe metropolis could earn at least ₦ 37.84 as net income for every ₦ 100 retail price paid by the final consumer in the marketing process. This is an indication of the extent to which the price of sheep reflects the wishes of the consumers in the study area [33]. However, reference [33] recorded marketing efficiencies of 33% and 46% for sheep and goat in Sokoto metropolis respectively; and concluded that marketing of sheep and goats overreact to market information. This could be as a result of too much speculation about the spatial and seasonal fluctuations in the prices of animals by the marketers. Since marketing efficiency is a function of both the pricing and

operational efficiency; reference [33] admitted that the marketing functions were properly performed among the marketers. Conversely, reference [68] posited that cattle markets in Nigeria were characterised by inefficiencies. Also, reference [51] reported marketing efficiency (< 1) of cattle markets in Jos metropolis Plateau State, and concluded that the markets were inefficient. However, sheep marketing efficiency could be improved if the producers could either increase the firms' gate price or to possibly by-pass the market middlemen to get higher return from the sales [69]; and [70]. Moreover, the mean marketing margin (0.29) of sheep markets in Gombe metropolis could further assessed the marketing performance.

According to reference [71]; and [72], very high percentage of marketing margin sometimes indicates inefficiency because a high cost is incurred in the provision of marketing services; and middlemen are often blamed for earning excessive profits. This is not always so. However, an increase in absolute margin is not clearly an indicator of efficiency or inefficiency of the markets. It may mean that returns to factor inputs have increased rather than that the inputs are being wastefully utilized. Then again, the increase in margins may be due to an improvement in the services performed or the utilities created for the consumers. For instance, higher consumer prices as in *Tike-babba* market may not necessarily express high profit, but increased qualities and quantities of

service, low labour, capital and management productivity, leaving producers and consumers better off. While lower consumer prices as in *Tike-nasarawo* market may co-exist with inefficient resource use, poor coordination and consumer satisfaction, and disproportionate profit elements due to low productivity [73]. The finding implied that the

specific targeting traders would increase their profits they made off sheep trading, and at the same time maximise the utility the consumers from the purchases. According to [74], the higher marketing margins might be attributed to the reasons why the marketers remain in the business.

Table 5. Marketing efficiency of sheep in Gombe metropolis.

Market variables	Gombe Metropolitan Sheep Markets				Mean
	Jauro Abare	Nasarawo	Pantami	Tike-Babba	
Supply costs (₦)	377,000.00	287,625.00	573,125.00	1,101,375.00	584,781.25
Marketing costs (₦)	40,352.10	39,397.94	38,751.05	39,131.14	39,408.06
Total costs (₦)	417,352.10	327,022.94	611,876.05	1,140,506.14	624,189.31
Consumer price (₦)	543,500.00	414,500.00	788,500.00	1,537,450.00	820,987.50
Value addition (₦)	166,500.00	126,875.00	215,375.00	436,075.00	236,206.25
Marketing margin	0.31	0.31	0.27	0.28	0.29
Coefficients (%)	39.89	38.80	35.20	38.24	37.84

Source: Field survey data, 2017

3.5. Constraints to Sheep Marketing in Gombe Metropolis

Table 6 reveals all (100%) of sheep marketers in Gombe metropolis had complained seriously of non-remunerative prices on sales. This corroborates with high marketing costs especially the commission fees, transportation costs as a result of far distance from the source of supply and as well as high purchasing prices of the animals. Inadequate capital was also critical as far as sheep marketing in Gombe metropolis is concern; this was attributed to inadequate sources of credits; and had stated that if they had enough money, they would be able to increase the number of animals per supply, thereby making more profit and expand market size. Moreover, inadequate finance hinders marketers from getting the necessary resources and technologies which could assist them achieve higher marketing efficiency [75]. Brokers also create price instability so as to benefit themselves by misinforming traders about the prevailing market prices. This indicated that (84.62%) of the marketers faced difficulties in forecasting their gross returns, leading to poor planning. Also, too much seasonal variation in price especially during religious festivities, such that low price did not offer sufficient incentive for sufficient supply. The result agrees with [76] who asserted that frequent price variations of farm produce is a major concern to producers, marketers and consumers. Reference [77] added that commodity prices may reflect seasonal production patterns by being at the lowest at peak production and highest at lean period. Also, 89.01% of the marketers had complained of transport related problems, which had much dispersion. Most of the marketers depended on commercial vehicle as their means of transportation. In some cases, there were no or the roads were seasonal. This probably increased the transport fares. During the rainy season many of the villages and rural markets were not accessible with the town markets. Increased cost of

transportation due to the increased in oil price is also another problem mentioned.

Reference [78] added that, high transportation costs accounted for high proportion of the total marketing costs in most parts of the country. Reference [79] reported that, armed robbers used the opportunity of having bad roads; attacked and sometimes even killed marketers. The implication here is that, transportation problems are largely responsible for the slow increase in marketing efficiency and lead to continuous subsistence level of production in many parts of the supply sources. This also made both producers and marketers to resort sales at the nearby markets thereby losing greater proportion of their supposedly income to exploitatively dubious middlemen in the area [45]. Reference [30] admitted that any of the available modes of transportation in Dambam Local Government Bauchi State had its own inherent problem which results to emaciation, loss and death of the animals in transit. Also, the activities of unregulated livestock produce checking points and theft cases along these routes compound the marketing problems. This drastically reduces the profit of sheep marketers in the study area. Table 6 further revealed that 98.90% of the respondents had problems of low access to formal loan to boost their marketing activities. This agrees with [42], who in their findings reported that 80% of marketers in the State had complained of lack of credit access associated with the volume of loan, cumbersome procedures, interest rates, lack of collaterals and several trips to the bank before loan was granted were their major problems. Reference [35]; and [40] added that small-scale agribusiness firms faced a number of barriers in obtaining credits. This is because most of them operate within a vicious cycle of poverty that prevent them access to such formal loans. Moreover, the marketers had problems of; scarcity of animals during festivals, diseases and pests, risks of buying unhealthy animals, theft/insecurity

and as well as low educational level. Other market facilities such as clean environment, good sheds, veterinary services, fire services, banks, security, water supply, and good toilets etc. which contribute to efficient marketing were also lacking.

Table 6. Constraints to sheep marketing in Gombe metropolis.

Constraints	*Frequency	Percentage	Ranking
Inadequate capital	89	97.80	3 rd
Transportation problems	81	89.01	7 th
Risk of buying unhealthy animal	80	87.91	8 th
Price fluctuations	77	84.62	9 th
Diseases and pests	82	90.11	6 th
High marketing costs	75	82.42	10 th
Lack of credit access	90	98.90	2 nd
Scarcity of animals during festivals	84	92.31	5 th
Poor market intelligence	71	78.02	11 th
Low educational level	69	75.82	12 th
Poor market infrastructures	88	96.70	4 th
Non-remunerative prices	91	100.00	1 st
Theft/insecurity	63	69.23	13 th

* Multiple responses

Source: Field survey, 2017

4. Conclusion

Based on the results obtained from this study, it may be concluded that the enterprise is profitable, dominated mostly by young married males who acquired one or the other form of education. The total returns recorded by the study implied that all the participants were able to cover the total costs incurred in sheep marketing in the study area. It is however, a clear indication that the business is efficient and has the potentials of increasing the marketers' income; which can induce and attracts new entrants into the market. The study will therefore serve as a guide for further research into small ruminants' value chain, and also a base line for policy makers to intervene in designing changes and formulating a more effective market policy for the growth and development of livestock sector.

5. Recommendations

Based on the findings of the study, the following recommendations were made aimed at improving the performance of sheep marketing in Gombe metropolis Nigeria;

- a) Meat consumption still remains the major source of proteins; as shown by positive gross margins, heavy and sustained investment by individuals and government in this sector is recommended, so that production and marketing of sheep will become a focal business away from its present subsistence state;
- b) Governments and NGOs should intervene to encourage

sheep marketers to engage in cooperative activities by providing the initial take-off capital needs and fostering an enabling environment for cooperative activities to thrive. This will also enable them reap the advantage of economies of scale. In addition, it will help facilitate easy acquisition of formal credit facilities for the advancement of their enterprises;

- c) Governments and other stakeholders should provide favourable and functional market regulating framework that can eliminate illegal fees or taxes charged along marketing channels for small ruminants. Also, government should harmonise taxes paid by the marketers and producers so as to have a unified livestock taxing system;
- d) Transportation related problems could be solved through the provision of good and accessible roads in and around the supply sources, so as to reduce the cost of conveying live animals to the markets. Also, Governments should improve policies on security measures; to help reduce the rate of insecurities like armed robbery on the highways;
- e) Improvement in existing infrastructural facilities will help promote expansion of the present scale of operation. This is important once the small ruminants' producers are assured of ready market and good bargaining for their efforts in meeting the protein needs of the populace. However, Government and Marketers' unions should adequately provide the needed infrastructures in and around the sheep markets in the study area.

References

- [1] Delgado, C. L., RoséGrant, M. W. & Meier, S. (2001). *Livestock 2020: The Revolution Continues* Communication Presentee a La Reunion Annuelle de la International Agricultural Trade Research Consortium (IATRC), Auckland, New Zealand, 18th – 19th January, 39pp.
- [2] Food and Agriculture Organisation; F. A. O. (2005). *Livestock Sector Brief* (Benin, Burkina Faso, Cote ivories, Ghana, Guinea, Gambia, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone). Livestock Information Sector Analysis and Policy branch, Animal Production and Health Division, Rome, FAO, 180pp.
- [3] Azage, T., Berhanu, G. & Dirk, H. (2006). *Institutional Arrangements and Challenges in Market-Oriented Livestock Agriculture in Ethiopia*, Paper presented at the 14th Annual Conference of the Ethiopian Society of Animal Production (ESAP), held at Addis Ababa, Ethiopia, 5th September, Pp 1–20.
- [4] GOSEEDS. (2007). *Gombe State Economic Empowerment and Development Strategy: Handbook*, Abuja, Dandafid Nig. Ltd, 11pp.
- [5] Ibrahim, H. (1998). *Small Ruminant Production, Techniques*. ILRI Manual, 3ILRI (International Livestock Research Institute), Nairobi Kenya.

- [6] Fafchamps, D., Marcel, H. A. & Sarah, G. (1997). The Determinants of Livestock in Niger. *Journal of African Economics*, 6 (2): 255–295.
- [7] Kogsey, I. S., VanArendonk, J. A. M. & Barker, R. (2003). Economic Value for Traits of Meat Sheep in Medium to High Production Potential Areas of the Tropics. *Small Ruminants Research*. 50 (9): 187–202.
- [8] Nibbering, J. W., Van Rheenen, T., & Slingerland, M. (2000). Assessing the Financing and Insurance Capacity of Livestock in Mixed Farming Systems. *Tropical Resource Management Paper*, No. 34, Pp 125–139.
- [9] Haelein, G. F. W. (2001). Past, Present and Future Perspective of Small Ruminant Dairy Research. *Journal of Dairy Science*, 8 (4): 2097–2115.
- [10] Ethui, S. K., Ahmed, M. M., Bernahu, G., Benin, S. E., NinPratt, A., & Lapar, M. L. (2003). 10 years of Livestock Policy Analysis: Policies for Improving Productivity, Competitiveness and Sustainable Livelihood of Small-holder Livestock Producers. (*International Livestock Research Institute*) ILRI; Nairobi, Kenya, 32pp.
- [11] Francis, P. A. (1990) Small Ruminant Marketing in Southwest Nigeria. *Journal of Agric. Econ.* 5 (20): 71–90.
- [12] Andargachew, K. (1990). Sheep Marketing in the Central Highlands of Ethiopia, Unpublished M.Sc. Thesis; Ale Maya University of Agriculture, School of Graduate Studies, Dire Dawa, Ethiopia, 168pp.
- [13] Raj, K. Y., Chauban, A. K. & Sharma, S. P. (2007). Economics of Milk Marketing in Jaipur District of Rajasthan. *Indian Journal of Dairy Science*, 60 (2): 307–312.
- [14] Scott, G. J. (1995). *Prices, Products and People: Analyzing Agricultural Markets in Developing Countries*, London, Lynne Rienner Publishers, 498pp.
- [15] Oluwatayo, I. B., Sekumade, A. B. & Adesoji, S. A. (2008). Resource use Efficiency of Maize Farming Households in Rural Nigeria: Evidence from Ekiti State. *World Journal of Agricultural Sci.*, 4 (1): 91–99.
- [16] Osinowa, O. A. (1990). Breeding Selection Reproduction and Breed Management in the Local Small Ruminant Breeds. In: Osinowa, O. A. & Abatan, A. A. (eds.). *The Nigerian sheep and goat Production manual*, NAPRI, A.B.U. Zaria, Pp 7–18.
- [17] Belachew, H. & Jemberu, E. (2003). Challenges and Opportunities of Livestock Marketing in Ethiopia. Proceedings of the 10th Annual Conference of the Ethiopian Society of Animal Production (ESAP) held in Addis Ababa, Ethiopia, August 22nd – 24th, ESAP, 2003, Addis Ababa, Ethiopia, Pp 1–13.
- [18] Kohls, R. L. & Uhl, J. N. (1990). *Marketing of Agricultural Products*, (6th edition), New York, Macmillan Publishing Company, 515pp.
- [19] GOSEEDS. (2007). Gombe State Economic Empowerment and Development Strategy: Handbook, Abuja, Dandafid Nig. Ltd, 17pp.
- [20] Gombe State Gombe [G.S.G] (2015). Gombe State Government: Profile. Retrieved on 15/03/2017; from <http://www.tiptopglobe.com/cities-nigeria?region=55&n=Gombe&a=G>
- [21] United Nations Organisation [UNO]; (UNO, 2017). Reports on World Population; 2017 Statistics
- [22] Ali, A. & Denga, I. D. (1983). *An Introduction to Research Methods and Statistics in Education and Social Sciences*, Jos, Savannah Publishers Limited, 213pp.
- [23] Saunders, M. N. K., Lewis, P. & Thornhill. A. (2009). *Research Methods for Business Students*, (5th ed.). Harlow, United Kingdom, FT Prentice Hall, 225pp.
- [24] Otokiti, S. O. (2005). *International Business: How to Get Started in International Business Environment*, Lagos, Pumarck Publishers Nigeria Limited, 249pp.
- [25] Nnamdi, A. (2000). *Research Methodology in the Behavioural Sciences*, Lagos, Longman Nigeria Plc, 194pp.
- [26] Alamu, J. F. & Olukosi, J. O. (2010). *Simplified Research Methodology: Principles and Practices*: (revised edition), Zaria, Great Glory Publishers, 130pp.
- [27] Saleh, A., Kolo, A., Idi, S., Sani, M. H. & Ochi, J. E. (2015). Profitability and Marketing Efficiency of Small-scale Groundnut Oil Processing in Gombe Metropolis Gombe State, Nigeria. Proceedings of the 29th Annual conference of the Farm Management Association of Nigeria (FAMAN), held at the Faculty of Agriculture, Federal University Dutse, Jigawa State, Nigeria.” 23rd – 26th November, Pp 237–248.
- [28] Hamidu, B. M., Kuli, S. G. & Mohammad, I. (2007). Profitability Analysis of Groundnut Processing among Women Entrepreneurs in Bauchi Metropolis. *Management Network Journal*, 3 (6): 389–395.
- [29] Girei, A. A., Dauna, Y. & Dire, B. (2013). An Economic Analysis of Groundnut (*Arachis hypogea*) Production in Hong Local Government Area of Adamawa State, Nigeria. *Journal of Agricultural and Crop Research*, 1 (6): 84–89.
- [30] Kolo, A. (2015). Economics of Sheep Marketing in Dambam Local Government Area of Bauchi State, Nigeria. Unpublished M.Sc. Thesis; Department of Agricultural Economics and Extension, Abubakar Tafawa Balewa University Bauchi, 108pp.
- [31] Olukosi, J. O. & Isitor, S. U. (2005). *Introduction to Agricultural Marketing and Prices: Principles and Applications*, Abuja, Living Books Publishers Company, 117pp.
- [32] Adekanye, T. O. (1988). *A Rice Grading Scheme for Nigeria*, In: Adekanye T. O. (eds): Readings in Agricultural Marketing (1988), Lagos, Longman Group Limited, 215pp.
- [33] Olukosi, J. O. & Isitor, S. U. (1990). *Introduction to Agricultural Marketing and Prices: Principles and Applications*, Abuja, Living Books Series/G.U. Publications, 115pp.
- [34] Iheanacho, A. C. (2005). Structural Characteristics and Performance of Retail Marketing of Egg in Maidugri Metropolis of Borno State Nigeria. *Journal of Sustainable Dev. in Agriculture and Environment*. 1 (4): 70–76.
- [35] Daneji, M. I., Malumfashi, A. I. & Muhammed, S. G. (2006). Profitability Analysis of Groundnut Production in Bauchi L.G.A. of Bauchi State, Nigeria. *Savannah Journal of Agriculture*, 1 (2): 165–170.
- [36] Rahman, S. A. (2014). *Fundamentals of Econometrics*, Abuja, Fix Impression Ltd., 119pp.

- [37] Rangasamy, N. & Dhaka, J. P. (2008). Marketing Efficiency of Dairy Products for Co-operative and Private Dairy Plants in Tamil Nadu. A Comparative Analysis. *Journal of Agricultural Economic Research*, 2 (1): 35–242.
- [38] Abah, D. A., Godwin, A. A. & Peter, A. I. (2015). Analysis of the Performance of Paddy Rice Marketing in Benue State, Nigeria. *Journal of Agricultural Science and Engineering*, 1 (3): 143–152.
- [39] Alkali, H. A. & Saleh, A. (2013). Socio-economic Profile of Camel Herders in Sokoto State, Nigeria. *International Journal of Food and Agricultural Research*, 10 (1&2): 105–108.
- [40] Mohammed, S., Isiaka M., Ishaku, A. & Zaharadden, D. (2013). Economic Analysis of Cattle Marketing in Gombe Metropolis, Nigeria. *Asian Journal of Agricultural and Rural Development*, 3 (12): 960 – 965.
- [41] Karshi, L. Y. (2010). Economics of Rice and Maize Marketing in selected Markets in Abuja Municipal Area Council, Federal Capital Territory, Nigeria. M.Sc. Thesis; Department of Agricultural Economics and Extension, ATBU Bauchi, Bauchi State Nigeria, 109pp.
- [42] Saleh, A., Kolo, A. & Mahmud, Y. Y. (2016). Socio-economic Determinants and Constraints of Modern Groundnut Oil Processing in Gombe State Nigeria. Proceedings of the 10th International Annual conference of the African Farm Management Association (AFMA), (AFMA10), Lé Meridién Hotel, Pointé aux Piments, Mauritius. 20th – 25th November, Pp 139–150.
- [43] Bose, A. A. (2008). Economic Analysis of Cattle Marketing in Akko Local Government Area, Gombe State, Nigeria. Unpublished M.Sc. Thesis; Department of Agricultural Economic and Extension, Abubakar Tafawa Balewa University Bauchi, 108pp.
- [44] Lenka, D. M., Dung, E. L., Asumugha, G. W. & Panwal, E. (2006). Marketing of Potatoes and Its Benefit to Potato Traders in Plateau State Proceedings of the 29th Annual National Conference of Farm Management Association of Nigeria, Federal College of Forestry Jos, Plateau State, Nigeria. Pp 367 – 371.
- [45] Saleh, A., Kolo, A. & Garba, S. A. (2017). Gross Margin Analysis of Modern Groundnut Oil Extraction in Gombe Metropolis Gombe State, Nigeria. *World Journal of Agricultural Research*, 5 (2): 58–63.
- [46] Girei, A. A., Dire, B. and Bello, B. H. (2014). Economics of Cattle Marketing on the Socio-economic Characteristics of Cattle Marketers in Central zone of Adamawa State, Nigeria. *International Journal of Advance Agricultural Research*, 2 (2): 1–7.
- [47] Oladoja, M. A., Adedoyin, S. E. & Adeokun, O. A. (2008). Training needs of fishers' folk on fishing technologies. *Journal of Food Agric. Env. Sci. Technol.*, 6 (1): 31–34.
- [48] Iheke, O. R., Obasi, O. I. & Nwankwo, J. C. (2008). Socio-economic Determinants and Allocate Efficiency of Arable Crop Farmer in Ikwuano Local Government Area of Abia State, Nigeria. Proceedings of the 42nd Annual Conference of the Agricultural Society of Nigeria (ASN), Pp 809–812.
- [49] Ibrahim, S. S. & Aliero, H. M. (2012). An Analysis of Farmers Access to Formal Credit in the Rural Areas of Nigeria. *African Journal of Agricultural Research*, 7 (47): 6249–6253.
- [50] Pius, C. F. & Odjurwuedernie, E. I. (2006). Determinants of Yam Production and Economic Efficiency Among Small-holder Farmers in Southern Nigeria. *Journal of Central European Agriculture*, 7 (2): 333–338.
- [51] Okeke, K. I. (2007). Economics of Cattle Marketing in Jos Plateau State Nigeria, Implications for Efficient Market Development and Sustenance in Nigeria. Proceedings of the 9th Annual National Conference of the Nigerian Association of Agricultural Economics (NAAE), Abubakar Tafawa Balewa University Bauchi. 5th – 8th November, Pp 142–146.
- [52] Oseni, J. O. (2010). Effects of Deregulation Policy on Cocoa Marketing in Ondo State, Nigeria. Unpublished Ph.D. Dissertation; Federal University of Technology Akure, Nigeria, 235pp.
- [53] Mafimisebi, T. E. & Okunmadewa, F. Y. (2006). Are Middlemen Really Exploitative? Empirical Evidence from the Sundried Fish Market in Southwest, Nigeria. Proceedings of the 13th Biennial Conference of the International Institute of Fisheries Economics and Trade, 12pp.
- [54] Mubi, A. A., Michika, S. A. & Midau, A. (2012). Cattle Marketing in Mubi Area of Adamawa State Nigeria. *Agriculture and Biology Journal of North America*, 4 (3): 199 – 204.
- [55] Maikasuwa, M. A. & Jabo, M. S. (2014). Analysis of Sheep and Goats Marketing in Sokoto Metropolis, Sokoto State, Nigeria. *International Journal of Agricultural Sciences and Veterinary Medicine*, 2 (1): 185–198.
- [56] Arena, C. O. (1998). *Introduction to Agricultural Marketing Analysis for Development Economics*. Nsukka, FUUADU Publishers, 237pp.
- [57] Mafimisebi, T. E., Oguntade, A. E., & Mafimisebi, O. E. (2010). Re- Engineering Agriculture for enhanced Performance through Financing. *Journal of Economics, Finance and Administrative Sciences*, 15 (29): 35–49.
- [58] Jabil, Y. I. (2009). Marketing of Selected Processed Dairy Products in Bauchi State Nigeria, Unpublished, M.Sc. Thesis; Department of Agricultural Economics and Extension, Faculty of Agriculture and Agricultural Technology, Abubakar Tafawa Balewa University Bauchi, 113pp.
- [59] Esiobu, N. S. & Onubuogu, G. C. (2014). Socio-economic Analysis of Frozen Fish Marketing in Owerri Municipal Council Area, Imo State, Nigeria: An Econometric Model Approach. *Scholarly Journal of Agricultural Science*, 4 (8): 449–459.
- [60] Botlhoko, G. J. & Oladele, O. I, (2013). Factors Affecting Farmers Participation in Agricultural Projects in Ngaka Modiri Molema District, North West Province, South Africa. *Journal of Human Ecology*, 41 (3): 201–206.
- [61] Makka, B. T. (2009). Economic Analysis of Tomato Production in Yamalta-Deba LGA, Gombe State, Nigeria. Unpublished M.Sc. Thesis; Department of Agricultural Economics and Extension, ATBU, Bauchi, 163pp.
- [62] Okewu, J. & Iheanacho, A. C. (2015). Socio-economic Characteristics of Goat Marketers in Benue State, Nigeria. *ARC Journal of Social Sciences and Humanities*, 1 (1): 54–66.
- [63] Iheanacho, A. C. & Ali, E. A. (2010). Economics of Sahelian Goat marketing: A case study of Maiduguri Metropolis Borno State. *Journal of Veterinary Science*, 9 (1): 234–246.

- [64] Issahaku, H., Paul, K. N. & Yazidu, U. (2012). Structure, Conduct and Performance of Tomato Marketing in Ghana. *Journal of Economics and Sustainable Development*, 3 (10): 222–235.
- [65] Okewu, J. & Iheanacho, A. C. (2015b). Profitability of Goat Marketing in Benue State, Nigeria: A Study of Selected Local Government Areas. *International Academic Journal of Educational Res.*, 10 (2): 54–74.
- [66] Giroh, D. Y., Umar, H. Y. & Yakubu, W. (2010). Structure, Conduct and Performance of Farm Gate Marketing of Natural Rubber in Edo and Delta States, Nigeria. *African Journal of Agricultural Research*. 5 (14): 1780–1783.
- [67] Haliru, Y. U. & Ibitoye, S. J. (2014). Evaluation of Market Structure and Efficiency of Gum Arabic Marketers in North-Eastern Nigeria. *Asian Journal of Management Sciences and Economics*, 1 (1): 1–11.
- [68] Sahib, B., Aliyu, A. & Bakoshi, J. S. (1997). National Agricultural Research Plan, 1998 – 2010: Federal Ministry of Agriculture, Abuja, Nigeria. Pp. 3–35.
- [69] Mafimisebi, T. E., Bobola, O. M. & Mafimisebi, O. E. (2014). Fundamentals of Cattle Marketing in Southwest, Nigeria: Analyzing Market Intermediaries, Price Formation and Yield Performance. *Journal of Applied Tropical Agriculture*, 19 (1): 30–38.
- [70] Bipradas, R. (2014). Studies on Marketing Efficiency of Agricultural Products in India: A Critical Evaluation. *International Journal of Multidisciplinary Research and Development*, 1 (7): 205–210.
- [71] Ahmed, R. & Rustagi, N. (1985). Marketing and Price Incentives in African and Asian Pricing Policy, ELZ Dieter, (ed), Washington DC, World Bank.
- [72] Ike, P. C. & Chukwuji, C. O. (2005). Efficiency Measurement of Cashew nut marketing in Enugu State, Nigeria. *Journal of Agriculture, Food, Environment and Extension*, 4 (1): 46–49.
- [73] Trotter, B. W. (1992). Applying Price Analysis to Marketing Systems: Methods and Examples from the Indonesian Rice Market. Marketing Series 3. Natural Resource Institute, Chatham, Chatham house, UK.
- [74] Afolabi, J. A. (2007). Evaluation of Poultry Egg Marketing in South Western Nigeria. *International Journal of Poultry Science*, 6 (5): 362–366.
- [75] Esiobu, N. S., Onubuogu, G. C. & Okoli, V. B. N. (2014). Determinants of Income from Poultry Egg Production in Imo State, Nigeria: An Econometric Model Approach. *Global Advanced Research Journal of Agricultural Science*, 3 (7): 186–199.
- [76] Suleiman, A. & Isah, S. I. (2010). Spatial Integration of selected Markets of dried Chili pepper and Ginger in Northern Nigeria. *Savannah Journal of Agriculture*, 1 (5): 29 – 37.
- [77] Godwin, B. K., Grennes, T. J. & Craig, L. A. (2001). Mechanical Refrigeration and the Integration of Perishable Commodity Markets. *Explorations in Economic History*: 39: 154–182.
- [78] Awotide, D. O. & Ajala, S. O. (2007). Performance and Determinants of Maize Grain Marketing in Northern Nigeria. Proceedings of the 9th Annual National Conference of the Nigerian Association of Agricultural Economics (NAAE), Abubakar Tafawa Balewa University Bauchi. 5th – 8th November, Pp 329–335.
- [79] Saleh, A., Ochi, J. E., & Sani, M. H. (2016). Efficiency Measurement of Modern Groundnut Oil Processing of RMP-12 and Ex-dakar Varieties in Gombe Metropolis Gombe State, Nigeria. *Journal of Behavioural Economics, Finance, Entrepreneurship, Accounting and Transport*, 4 (3): 71–80.