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Economics of Livestock Marketing in Gamawa Local Government Area, Bauchi State, Nigeria

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Abstract

The study examined the profitability of livestock marketing in Gamawa Local Government Area, Bauchi State in the year 2012. A combination of both purposive and simple random sampling techniques was employed to collect data from one hundred and twenty marketers, using structured questionnaire. The data were analysed using descriptive statistics, farm budgeting and multiple regression analysis. The result showed that goat and cattle marketers had the mean age, marketing experience and household size of 46 and 40 years, 11 and 13 years, 9 and 13 persons, respectively. In addition, marketing margin and returns per Naira invested per goat and cattle in the study area were N 4,016.66 and N38, 816.6, and N0.14 and N0.26, respectively. The findings revealed that cost of goat acquisition, medication, and labour were significant at $P \leq 0.01$, $P \leq 0.05$ and $P \leq 0.1$, respectively; while in the case of cattle marketing, cost of cattle acquisition, feeding, medication, and labour were significant at $P \leq 0.01$, $P \leq 0.05$, $P \leq 0.1$ and $P \leq 0.1$, respectively. The study identified inadequate credit facilities, lack of market information, high cost of transportation and inadequate housing facilities as the most pressing constraints affecting the system. It was therefore recommended that provision of adequate housing facilities, sources of market information and easing access to credits as well as lowering transportation costs in order to improve in the areas of shortcoming.

Key words: *Goats, Cattle, Marketing, Profitability and Influencing Factors.*

Introduction

Animal agriculture is an indispensable pre-requisite towards the sustainability of human development because of food provision, employment generation, etc (Oluwafemi, et al 2001). In Nigeria, a high percentage of population earns their living from agriculture and agricultural orientated activities; and therefore contributes to the development of the nation. Crop production, forestry, fishery, and livestock account for 18-20% of Nigeria's Gross Domestic Product (GDP), the livestock sub-sector alone accounted for 4.5-5% (FAO, 2001). In the same vein Anon (2006) reported that Nigeria's livestock sub-sector has characteristics of capital investment yielding an interest in the form of beef, milk, eggs, and other valuable products. Apart from serving as a source of food for human consumption, animal agriculture is also important in providing non-food materials such as hides, skins, wool, feathers etc, which are in turn used as raw materials for manufacturing other valuable products such as hides and skin for leather goods.

FAO, (2003) reported that cattle contributes over 50% of the national meat supply while the remaining 40 - 50% is contributed by other classes of livestock and other domesticated animals. Thus, 35% are from sheep and goats, 10% from poultry and the rest from pigs, donkeys, horses, camels and other domesticated animals as well as bush meat. This makes sheep and goats the second most important supplier of meat after cattle. Lombin, (2011) stated that, Nigeria has a livestock population of about 16.3 million cattle, 40.8 million goats and 27 million sheep, 151 million poultry, 3.7 millions pigs 900,000, donkeys and 90,000 camels. Despite the large population of livestock in Nigeria, the protein intake is still below the minimum requirement (FAO, 2001). Intake of animal protein at present is 4.82g/caput/day (Tewe, 2008), as against a minimum requirement of 75g/caput/day recommended by the FAO.

Kohls and Uhl (2009), defined marketing as the performance of all business activities involved in the flow of the product from the point of initial production until it reaches the hands of the consumers. According to Olukosi *et al* (2008) market is said to exist whenever a transaction is done between a buyer and seller, be it through physical contact, letter writing, telephone, telex or through other means of communication. Kotler, (2002) defined marketing as the social process by which individuals and group obtained what they need and want through creating and exchanging products and values with others. Furthermore, an efficient marketing system among other contributions stimulates output and consumption which are essential elements of economic development (Maria, 1999).

The biggest problem with goats marketing in Nigeria is parasite control. The parasite poses a major constraint to goat owners across the nation, although they are more of a problem in the southern part of the country (Bennet, 2002). They tend to be more troublesome where it is warmer, wetter and humid. Most commercial goat marketers de-worm at least three or four times per year. Other problem includes shelter, predators etc. (Bennett, 2002). Poor infrastructural facilities and inadequate health services leads to heavy economic losses for marketers due to high mortality. Lack of awareness of markets, pricing structure, unorganized marketing facilities, coupled with distress sales, not receiving fair price for their animals by the marketers. Mostly the animals are sold to traders, middlemen or butchers at farm gate (due to inadequate transportation and time constraints) or nearby village weekly markets where no rule and regulations are effective (Balkrishna and Kalia, 2008). Markets for goats were also a main problem in Nigeria, in situation where markets are available, the prices were so low that returns would be very small (Mupawaenta, 2005).

Objectives of the Study

The broad objective of the study was to compare the economics of goats and cattle marketing in the study area. The specific objectives of the study were to:

- i) describe the socio-economic characteristics of goats and cattle marketers in the study area,
- ii) determine the profitability of goats and cattle marketing in the study area,
- iii) determine the factors that influence the goats and cattle marketing in the study area, and
- iv) identify the major constraints in the cattle and goats marketing in the study area.

Methodology

The Study Area

The study was conducted in Gamawa Local Government Area of Bauchi State, Nigeria which is about 300km away from the state capital, Bauchi. The area is located in the plain of the northern part of Bauchi State, which is in the semi-arid sahel zone of the tropical Savannah region of West Africa. Its geographical coordinates are latitude 12.13°N to 12.53°N and longitude 10.53°E to 10.72°E. The area is bounded on the eastern part

by Jakusko and Nangere Local Government Areas of Yobe State, on the southeast, southwest and northwest by Dambam, Katagum and Zaki Local Government Areas, respectively.

Gamawa Local Government Area has an average rainfall of 800mm which can take 4 - 5 months from May to September annually. The area has less vegetation with average temperature of 28°C (Encyclopaedia, 2011). Further, the area had a total land mass of about 2,925km² with 286,388 population according to National Population Census, (2006). The predominant ethnic groups in the area are Kanuri, Fulani and Hausa in which 80% of the citizens are farmers and traders. The soil of the area is predominantly sandy-loam which is good for crops such as millet, sorghum, cowpea, sesame, ground nut etc. and the major animals produced include cattle, sheep and goats (BSADP, 2010).

Sampling procedure

Purposive sampling technique was adopted in this study, five (5) markets were purposively selected out of the ten (10) markets, these markets were selected based on their accessibility, sizes of the markets, large population of buyers and sellers of goats and cattle. The selected markets were; Gamawa, Gadiya, Gololo, Raga and Wabu livestock markets. Random sampling technique was used to select sixty (60) goat and sixty (60) cattle marketers, thus giving a sample of one hundred and twenty (120) marketers.

Data collection

Primary data were collected using structured questionnaires supplemented by verbal interviews of the goats and cattle marketers. In gathering the data, two different sets of questionnaires were used; a set of sixty (60) each per category of the livestock marketers.

Data analysis

Data were analyzed using both descriptive and inferential statistics, such as means, percentages and standard deviations as well multiple regression analysis. Other economic tools like budgeting technique were also employed.

Budgeting technique

This technique in form of Gross Margin Analysis was used to satisfy objective two (2) according to Olukosi *et al*, (2008). Gross Margin expressed as;

$$GM = GI - TVC \quad \dots\dots\dots (1)$$



Where GM = Gross Margin

GI = Gross Income

TVC = Total Variable cost

Multiple regression analysis

This was used to satisfy objective three i.e. to determine the relationship between revenue and each component of the TVC in the goat and cattle such as cost of transportation, medication, feeding, acquisition cost per head, etc.

The model was implicitly expressed as

$$Y = f (X_1 X_2 X_3 X_4 X_5 X_6 X_7 X_8 \mu) \dots\dots\dots (2)$$

Where Y= Revenue

X¹ = Acquisition Cost

X₂ = Cost of labour

X₃ = Medication Cost

X₄ = Transportation cost

X₅ = Market revenue charges

X₆ = Middlemen commission

X₇ = Feed cost

X₈ = Temporary house cost

μ = Error cost

The explicit forms of the model were presented as follows:

Linear function

The linear function was expressed as:

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_5 X_5 + b_6 X_6 + b_7 X_7 + b_8 X_8 + e \dots\dots\dots (3)$$

Where: Y = revenue

X₁-X₈ = variable costs

b₁-b₈ = regression coefficients

a = constant

e = error term

(i) Double log function ;

The double log function is expressed as:

$$\log y = \log a + b_1 \log X_1 + b_2 \log X_2 + b_3 \log X_3 + b_4 \log X_4 + b_5 \log X_5 + b_6 \log X_6 + b_7 \log X_7 + b_8 \log X_8 + e \quad \dots\dots\dots (4)$$

Where: Log y = revenue

$\log X_1 - \log X_8$ = Variable costs

$b_1 - b_8$ = regression coefficients

log a = constants

log e = error term

However, out of these functional forms, the linear form was the lead equation which was selected based on the number of significant variables, the R² value and agrees with *a priori* expectation.

Results and Discussions

Socio-economic Characteristics of the Respondents

Important socio-economic characteristics of the respondents identified include age, gender, household sizes, educational levels and experience in livestock marketing. Age is an important factor in agricultural marketing. The results revealed that 31.7% of the goat marketers and 20% of cattle marketers belong to the age class of 30-39 years while 28.3% and 20% of goat marketers as well as 35% and 33.3% of cattle marketers belong to the age class of 40-49 and 50-59 years respectively. But only 15% of goat marketers and 1.7% of cattle marketers belong to the age class of less than 30 years, as presented in Table 1.

The study observed that the mean age for goat marketers and cattle marketers was 46.58 and 40.22 years respectively. Thus, majority of the marketers were within the age bracket of 30 to 39 and 40 to 49 years of goat and cattle marketers, respectively. This was an indication that a good number of them were energetic enough to carry out agricultural marketing activities.

Gender is a predominant factor in agricultural marketing; the results revealed that all (100%) the goat and cattle marketers were males. Marriage is an institution that cuts across communities, tribes and religion. It aids towards the supply of labour in agriculture. The study shows that 85% of the goat's marketers were married and all (100%) the cattle marketers were married.

The size of a household help in boosting agricultural marketing, the study

revealed that 25% and 33.3% of goat and cattle marketers respectively had household size between 5 to 9 persons; 50% and 28.3% of goat and cattle marketers had household size between 10 to 14; while 3.3% of goat marketers and 18.3% of cattle marketers had household size between 15 to 19 persons. The mean household size of goat and cattle marketers was found to be 9 and 13 persons respectively as presented in the Table 1.

In agriculture, the importance of education cannot be over-emphasized. Indeed, education represents a predetermining factor in information dissemination and technology adoption among marketers in diverse socio-economic and biophysical environment. The results revealed that 18.3% goat marketers and 40% of cattle marketers had the non-formal Qur’anic education, while majority (50%) of goat marketers and 41.70% of cattle marketers had attended the formal education ranging from primary, secondary and tertiary education.

Expertise and mastery are attained through experience which is known to be the teacher. The results observed that, 25% of the goat marketers and 26.7% of cattle marketers had marketing experience ranging from 5 to 9 years, respectively; 41.7% and 40% of goat and cattle marketers had marketing experience of 10 to 14 years respectively.

Table1: Distribution of respondents according to socio-economic characteristics

Variable	Goat Marketers		Cattle Marketers	
	Frequency	%	Frequency	%
Age (years)				
Below 30	9	15	1	1.7
30 to 39	19	31.7	12	20
40 to 49	17	28	21	35
50 to 59	12	20	20	33.3
60 and above	3	5	6	10
Total	60	100	60	100

Household Size

Below 5	2	20	3	5
5 to 9	15	25	20	33.3
10 to 14	30	50	17	28.3
15 to 19	2	3.3	11	18.3
20 and above	1	1.7	9	15
Total	60	100	60	100

Education

Qur'anic	11	8	24	40
Primary	17	28.3	20	16.7
Secondary	10	6.7	12	20
Tertiary	3	5	3	5
Adult educ.	7	11.7	4	6.7
None	12	20	7	11.7
Total	60	100	60	100

Marketing Experience (years)

Below 5	3	5	1	1.7
5 to 9	15	25	16	26.7
10 to 14	25	41.7	24	40
15 to 19	12	20	7	11.7
20 and above	5	8.3	12	20
Total	60	100	60	100

Cost and Return of Goats and Cattle Marketing

Costs and returns of the livestock marketed in the study area are presented and discussed. Table 2 shows the net income of goat marketers found to be =N=3,037.41 for every goat sold in the study area. Total variable cost accounted for 99.71% of the total cost, while 0.29% of fixed cost was realized. Correspondingly, the cattle marketers net income was =N=33,926.70 for

every cattle sold in the study area. It has a total variable cost of 99.77% and 0.23% as fixed cost. The total variable cost of goat and cattle marketers were found to be =N=21,135.92 and =N=130,573.30 respectively.

The total revenue obtained from goat marketing for every one sold was =N=24,233.33 while for cattle was =N=164,500.00. This indicates that the higher gross income of the marketers was obtained under cattle marketing than in goats in the study area. The return per naira invested of goat and cattle marketers were =N=0.14 and =N=0.26, respectively. The result revealed that cattle marketers obtained higher returns per naira invested, therefore according to this study, cattle marketing was more profitable than goat marketing.

Table 2: Cost and return of goats and cattle marketing

Costs Components (₦)	Goat Marketers		Cattle Marketers	
	Average cost/goat (₦)	(%)	Average cost/cattle(₦)	(%)
(i) Variable Cost				
Cost of purchase	20,216.67	95.38	125,683.33	96.26
Feeding	99.67	0.47	474.50	0.36
Transportation	301.83	1.42	1,370.00	1.05
Medication	87.67	0.41	274.17	0.21
Middlemen	400.83	1.89	2,243.33	1.72
Labour	30.25	0.14	228.00	0.17
Total variable costs	21,135.92			
(ii) Fixed cost				
Market charges	40	0.19	200	0.15
housing	20	0.10	100	0.08
Total fixed costs	60		300	100
Total cost	21,195.92	100	130,573.30	
(iii) Revenue/animal	24,233.33		164,500.00	
Net income	3,037.41		33,926.70	
Return/naira invested	0.14		0.26	

Source: Field survey, 2011

In Table 3, the result revealed that operating ratios for goat and cattle marketers were 0.87 and 0.79 respectively, while fixed ratio was 0.002 for goat marketers and 0.001 for cattle marketers. The gross ratios for goat and cattle marketers were 0.875 and 0.794, respectively, while the rate of return on investment was 14% for goat marketers and 26% for cattle marketers. The study revealed that, profitability indicators were in favour of cattle marketing over goat, therefore cattle marketing was more profitable than that of goat marketing. Cattle marketing requires more capital than goat marketing, thus indicating that, the more capital invested the more the profit will be gained.

Table 3: Profitability Analysis of Goat and Cattle

Profitability Components	Goat	Cattle
GM (GI - TVC)	3,097.41	34,226.70
GI	24,233.33	164,500.00
Net income (GI - TC)	3,037.41	33,926.70
Operating Ratio (TVC/GI)	0.87	0.79
Fixed Ratio (TFC/GI)	0.002	0.001
Gross Ratio (TC/GI)	0.875	0.794
Return/naira invested (NI/TC)	0.14	0.26
Rate of returns on investment	14%	26%

Source: Computed from field survey data, 2011

Factors influencing goats and cattle marketing

Factors influencing goats and cattle marketing in the study area were examined and the result presented in Table 4 was discussed. The linear function was selected to explain the relationship between revenue marketing costs of goat and cattle because it had the best fit to the data as reflected in the magnitude of coefficient of multiple determination (of goat and cattle being 0.609 and 0.784 respectively). The result further revealed that out of the variables included in the model of goat marketing, acquisition cost per goat purchased, medical cost, cost of labour were significant at 1%, 5%, 1%, respectively. Others were not significant, feeding cost had negative regression coefficients indicating an inverse relationship and others had positive regression coefficients indicating a direct relationship between each of them and the revenue as presented in Table 4,

while in case of cattle, cost of purchased, feeding cost, medication cost and cost of labour were significant at 1%, 5%, 10%, 10%, respectively. Others were not significant. Cost of purchased, transportation cost, middlemen commission and cost of housing had positive regression coefficients indicating a direct relationship with revenue; while all other variables had negative regression coefficient indicating an inverse relationship with the revenue as presented in Table 4

Table 4: Factors influencing goat and cattle marketing

Variables	Coefficients		T-value Goat	T-value Cattle
	Goats	Cattle		
Constant	12,233.602 (0.003***)	52,758.649 (0.005***)	3.121***	2.907***
Cost of purchased (x_1)	0.384 (0.005***)	1.006 (0.000***)	2.933***	10.331***
Feeding cost (x_2)	-14.626 (0.534 ^{N S})	-38.975 (0.033**)	-0.626 ^{N S}	-2.196**
Medication cost (x_3)	-16.219 (0.038**)	-29.031 (0.078*)	-2.124**	-1.799***
Transportation cost (x_4)	1.171 (0.669 ^{N S})	1.581 (0.736 ^{N S})	0.430 ^{N S}	-0.339 ^{N S}
Cost of labour (x_5)	18.155 (0.009***)	-55.350 (0.054*)	2.299***	-1.975*
Middlemen commission (x_6)	4.700 (0.436 ^{N S})	6.830 (0.231 ^{N S})	0.782 ^{N S}	-1.214 ^{N S}
Market revenue charges (x_7)	96.201 (0.163 ^{N S})	-31.732 (0.246 ^{N S})	1.416 ^{N S}	-1.173 ^{N S}
Temporary house (x_8)	12.026 (0.841 ^{N S})	126.026 (0.102 ^{N S})	1.202 ^{N S}	1.667 ^{N S}
	<i>R² value</i>		60.9%	78.4%
<i>Adjusted R²</i>	54.7%	75.1%		
<i>F - value</i>	9.911***	23.204***		

Source: Computed from field survey data, 2011

*** = Significant at 1% level of probability* = Significant at 5% level of probability

** = Significant at 10% level of probability ^{N S} = Not Significant

Major constraints in cattle and goats marketing

The major constraints which hinder the profitability of both goat and cattle marketing in the study area were presented in Table 5. The results revealed that 36.7% of goat marketers and 31.7% of cattle marketers faced the problem of inadequate credit facilities respectively, lack of market information accounted for 23.3% and 25% of both goat and cattle marketers respectively. Abbott,(2002) stated that market information is very essential for producers, merchants marketers and consumers, if market mechanism are to work efficiently market information help

balance demand and supply. High cost of transportation accounted for 16.7% and 21.7% of goat and cattle marketers, respectively. This may be attributed to high cost and scarcity of fuel and inadequacy of feeder roads. Therefore transportation was one of the major laminating factors against goat and cattle marketing. Inadequate housing facilities such as shelter constitute a serious problem especially to small ruminants like goat that need adequate shelter during the rainy and harsh weather condition, while small space could not accommodate large number of cattle, the study revealed that 11.7% and 3.3% accounted for both goat and cattle marketing in the study area, respectively. Low profitability of the animals affects both goat and cattle marketing as indicated by 5% and 8.3% of goat and cattle marketers respectively. Other problems, such as those of thieves (armed robbers), non-commissioned middlemen, credit transaction, price fluctuation, disease etc, accounted for 6.7% and 10% for both goats and cattle marketing, respectively.

Table 5: Distribution of respondents according to major constraints

Constraints	Goat Marketers		Cattle Marketers	
	Frequency	(%)	Frequency	(%)
Inadequite credit facilities	22	36.7	19	31.7
Lack of market information	14	23.3	15	25
High cost of transportation	10	16.7	13	21.7
Inadequate housing facilities	7	11.7	2	3.3
Low profitability of animal	3	5	5	8.3
Others problems	4	6.7	6	10
Total	60	100	60	100

Source: Field survey, 2011

Conclusion

The study concluded that, goat and cattle marketing were profitable in the study area, though cattle marketing were more profitable. However, the most important factors influencing both goats and cattle marketing in the study area were cost of acquisition, medication and labour.

The marketing system would be improved if the following recommendations were adhered to: Provision of credit facilities, market information and marketing infrastructures to the market participants.

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