Economic Analysis of Small Ruminant Production in Bosso Local Government Area, Niger State, Nigeria.

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ABSTRACT

The paper examined the economic analysis of small ruminant production in Bosso local Government Area of Niger State. Data were collected from a total of 90 respondents using purposive random sampling technique in 2007. Inferential statistics, farm budgeting and regression analysis were used in the analysis of the data. Result of the allocative efficiency index showed that feed cost, labour, other inputs and fixed cost were underutilized. Thus, farmers should increase the use of these resources efficiently in order to enhance profit. This can be achieved by obtaining loans from agricultural banks and by encouraging farmers in the study area to form cooperative.

INTRODUCTION

Livestock production represent a major nutritional investment with important economic, nutritional and social implication for the country (Ademosun, 1996). Nigeria as a developing country is faced with a worsening situation of inadequate protein consumption (Eliagu, 1991). In a nutritional profile in Nigeria,Owolabi, (1998) reported that the protein supply per capita 44.0g out of which animal products was less than 2.0%. this has led to protein deficiency which is responsible for under-nutrition and malnutrition which are wide spread at all ages and in Nigeria in general.

It is therefore necessary to increase the production of domestic animal protein. One of such domestic animals that are relatively easy to manage in small household is the small ruminant. Small ruminants are known to be prolific, have short generation intervals and above all their management is less capital intensive, therefore can easily be managed in small household. The small ruminants under consideration are sheep and goat. the largest concentration of these small ruminants are found in the sudan savannah zones. A high percentage (between 75% to 90%) of traditional households keep sheep and /or goat for various purposes such as meat production, income from sales and security against crop failure among other reasons. From the foregoing, it is important to study the economic analysis of small ruminants production in Bosso Local Government Area (LGA), Niger State in order to assess the type of management system, determine the costs and returns from sheep and goat product and the rource-use efficiency of the enterprises. The finding from this study will be useful in policy formulation towards achieving increased livestock production in the country.

METHODOLGY

The Study Area

The study was carried out in Bosso Local Government Area (LGA) of Niger State. The state is located between latitude 8^0 21N and 11^0 30N and longitude 3^0 30E and 7^0 20E. Bosso LGA is geographically located in the central part of the State. Agriculture is the major occupation with about 80% of the population engaged in farming. The major crops produced in the area include; rice, guinea corn, yam and millet while groundnut, maize cowpea, cassava and sugarcane are produced as minor crops. Livestock farming is also practiced, with sheep, goats, cattle and poultry mostly on free range.

Sampling and Data Collection

The purposive sampling method was employed to select the respondents. 50 sheep farmers and 40 goat farmers were selected making a total of 90 respondent. The main instrument for data collection was structured questionnaire. Data were collected on socio-economic characteristics o the respondents, type of housing, system of management, input and output prices etc.

Data Analysis

The data were analyzed using descriptive statistics, farm budgeting and the production function approach. Descriptive statistics was used to describe the socio-economic characteristics of the farmers. The farm budgeting technique was used to analyze the profitability of the enterprises. The marginal productivities the various inputs used in sheep and goat used were determined by estimating a production function using ordinary least square (OLS) multiple regression analytical model which is specified in the implicit form as follows:

$$Y=f(X_1,X_2,X_3,X_4,X_5,e) \quad (1)$$

Where

Y = Revenue (Annual income from sheep and goat)
X_1 = Feed cost (N)
X_2 = Labour cost (N)
X_3 = Medication (N)
X_4 = Other costs (N)
X_5 = Fixed cost (initial capital invested in N)
e = Error term

Data were fitted into equation (1) for each of the following four functional forms namely; linear, Double-log, Exponential and semi-logarithmic functional forms. the linear functional form gave the equation of best fit based on the normal economic, econometrics and statistical criteria.

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents

The result indicated that 83.30% of the sampled farmers are male, while the remaining 16.70% are females. About 43.30% of the respondent had quaranic education. The average age of the sampled farmers and years of farming experience are 35 and 20 years respectively. The average household size was eight, while most farmers (42.20%) had a flock size range between 11 to 15. All the respondents employed only family labour in managing their enterprises. Most of the farmers either purchased or inherited their flock. The result further indicated that the majority of the farmers (83.30%) adopted the extensive system of management. This is in agreement with findings of (Ayoade *et al*, 1993, ; Abubakar *et al*, 2000, ; Jirgi and Tanko, 2008). Under the extensive system of management, animals are kept either in huts or open shade, this exposes the animals to unfavourable conditions which leads to disease infection, hence low productivity.

Costs and Returns

The profitability of any business can be determined from the relationship between the cost incurred in running the farm business and the returns accruing to it (Adegeye and Dittoh 1985). The costs and returns associated with small ruminant production in the study area is presented in Table1.

The result of the farm budgeting analysis revealed that the fixed cost constituted 30.23% for sheep and 25.30% for goats of the total cost of production of small ruminant enterprise. Fixed capital accounted for 30.43% and 44.41% for sheep and goat respectively. The result showed that a typical farmer realized a gross margin of N153, 597.82 and N 127,900.13 for sheep and goat respectively. The net farm income for sheep was N 46,462.82 while that of goat was N 31,366.13. The result showed that farmers realized profits, however profit can be enhanced if they improve on the management practices.

Production Function Analysis

The result in table2 indicated that linear equation form is the lead equation, which was used for that analysis. The adjusted R^2 value was 0.829 which implies that about 82.9% of the variation in income (Y), is explained by the input variables X_1 to X_5 (feed cost, labour cost, medical cost, other inputs cost and fixed cost) included in the model, while the remaining 17.1% is as a result of factors not included in the model. the variables feed cost, other input cost and fixed cost were significant at 1% while labour cost and medical cost were significant at 5% and 10% respectively. The coefficients of all the variables included in the model are positive implying that 1% increase in any of the variable holding others constant will lead to a resultant increase in the income of the farmer by the corresponding coefficient values of the variables.

Allocative Efficiency

A resource in (input) is considered to be mostly efficiently utilized if its Marginal Value Product (MVP) is just sufficient to offset its Marginal Factor Cost (MFC). the equality of MVP to MFC is the basic condition that must be satisfied to obtain the most efficient use of resources for productivity(Kay, 1981). The resource-use efficiency indices in small ruminant production in the survey a are presented in table3. The result in table 3 indicates that all the resources used in small ruminant production were underutilized. Small ruminant producers can increase their profit by increasing the use of these resources. The farmers should be encouraged to form cooperative in order to pool more resources for

increased small ruminant production in the study area.

CONCLUSION RECOMMENDATIONS

The study examined the economic analysis of small ruminant production in Bosso local Government Area of Niger State. The study revealed that feed cost, labour cost, medical cost, other inputs and fixed cost are the major variables which significantly explain changes in income of small ruminant farmers. The allocative efficiency of all the resources were under-utilized. Thus, farmers should increase the use of these resources in order to enhance profit. This can be achieved by obtaining loans from agricultural banks and by encouraging farmers in the study area to form cooperative.

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Table1: Costs and Returns of Small ruminants production in Bosso local Government Areas, Niger State, 2007

Items	Sheep		Goat	
	Average Value (N)	Percentage	Average Value (N)	Percentage
Costs				
Variable Costs				
Labour	93,080.00	26.44	30,700.45	14.12
Medical Cost	19,750.00	5.61	14,900.00	6.85
Feed Cost	106,430.68	30.23	55,000.23	25.3
Other Inputs Costs	25,675.50	7.29	20,250.15	9.32
Av. Total Variable Cost (ATVC)	244,936.18		120,850.83	
Fixed Cost (FC)	107,135.00	30.43	96, 534.00	44.41
Capital Investment				
Total Fixed Cost (TFC)	107,135.00		96, 534.00	
Av. Total Cost (ATC)	352, 071.18		217,384.83	
Av. Total Revenue(ATR)	398,534.00		248,750	
Gross Margin (GM)= ATR – ATVC	153,597.82		127, 900.13	
Net Farm Income (NFI) = ATR – ATC	46,462.82		31, 366.13	

Table 2: Estimated linear production function (lead equation)

Variables	Regression Coefficients	T-values
Constant		7.313
Feed Cost (X_1)	1.553	3.132**
Labour Cost (X_2)	0.755	*397.313
Medical Cost (X_3)	0.108	3.520***
Other Input Cost (X_4)	1.001	2.432**
Fixed Cost (X_5)	1.287	1.951*
R^2	0.829	3.894***
F Ratio	81.387***	4.096***

Source: Field Survey, 2007, *** = Significant at 1% level of probability, ** = Significant at 5% level of probability
* = Significant at 10% level of probability

Table3: Estimated efficiency Ratio (r)

Variables	MVP	MFC	Efficiency ratio
Feed Cost (X_1)	10,327.45	1393.67	7.41
Labour Cost (X_2)	5,020.75	1255.22	3.999
Other Input Cost (X_4)	6,656.65	1579.5	4.214
Fixed Cost (X_5)	8558.55	1095.28	7.814

Source: field survey, 2007