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Economic Analysis of Small Holder Sheep Production among Women in Gwarzo, Tofa and Gabasawa Local Government Areas of Kano State, Nigeria

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Abstract – **In the struggle for survival, many communities embark on activities designed to achieve security of food supply and other essential needs in order to sustain life. A study was conducted to analyze the economics by small scale women engaged in production of sheep in Kano State, Nigeria where poverty is widely prevalent. Using multistage sampling technique including simple random and purposive selection, one hundred and thirty (130) women sheep rearersf rom Gwarzo, Tofa and Gabasawa LGAs in Kano State were selected and interviewed by trained enumerators using well-structured questionnaires. The data were analyzed using statistical tools, such as means and frequency counts and gross margin. The results of the analysis revealed that 33.1% of the producers were in their active ages of 28-31 years with a mean age of 32 years. Respondents with Islamic education constituted 86.9% and 96.9% were married with an average Household members 5-6 accounting for 43.1% and a mean of 7 persons. About 43.1% of the respondents had experience of 10-13 years with average of 14 years in sheep rearing. The results also revealed that production of sheep was profitable with gross income of ₦10, 829.74 and total variable cost of ₦8,726.36 which gave a gross margin to be ₦2,102.9 per sheep per year . Producers had inadequate capital (28.5%) as the major problem affecting sheep rearing in the study area. It was concluded that sheep production was profitable despite the major constraints to improved productivity and livelihood. It is therefore recommended that there should be massive campaign to create awareness of the importance of western type education to improve literacy through women producer cooperative societies while extension workers should redesign new technologies delivery options for women sheep rearers that are readily available and affordable to encourage more intensive production of sheep while finance source be explored by all women in the area**.

Keywords – **Profitability, Sheep Rearing, Socio-Economics, Women.**

I. INTRODUCTION

The challenges of livelihood and the desire to uplift living standards for the present and future generations have combined to necessitate communities, especially in developing countries, to resort to the adoption of different strategies in order to cope with life and achieve economic growth. In Africa for instance, a substantial proportion of poor women engage in several different activities with many of such efforts heavily relying on natural resources, usually sourced from the environment and used by both human beings and their animals. One of such practices is the rearing of sheep and goats (small ruminants) by small scale women. The practice is widely adopted in Nigeria: in rural, urban and semi urban areas representing about 63.7% of total grazing by domestic animals in Nigeria (Nwafor, 2002).

Women play a major role in agricultural and livestock development. They are also key to addressing household food security and nutritional needs of the nation. In order to succeed, projects intending to increase agricultural productivity in developing countries like Nigeria, must ensure that the needs such as labour constraints, knowledge and decision making roles of women are properly addressed and analyzed before take-off(Ayele and Peacock,. 2003). All these mean that the roles of women need to be better understood, supported and complimented in an effort to sustain livelihoods. In fact, according to FAO (2010), women in Africa perform various functions in the livestock industry and yet there is little research about their roles in spite of the major roles of the agricultural sector as the leading provider of income, foreign earnings, employment, raw materials, and food in many African countries. Further, women contribute positively to economic development of many countries since they are involved in more than 80% of these agricultural activities. There may be variations in the role women play among countries in sub-Saharan Africa, but women in agriculture account for the greater proportion of economic development (FAO, 2010).

Raising small ruminants is regarded as relatively easy with minimal inputs and low maintenance costs particularly sheep and goats coupled with their ability to maximize utilization of available feed resources (Davendra *et al*., 2002). In most cases it is basically a secondary activity that employs low levels of family resources. Another important reason for small ruminant production is the major contribution made towards providing animal protein that is indispensable to a balanced human diet (Alini, 1987).

In Nigeria, sheep suffer from neglect in spite of their contributions to the national and household welfare and economy (Dahiya and Sharma, 1994). Most people engage in sheep production particularly the poor women, in order to improve their standard of living. It is therefore important to determine whether the women sheep producers make profit in the study area and how viable it is in improving the lots of the women. This study was carry out to determine the economics of raising sheep by

the women in the study areas while the specific objectives are to:

1. Describe the socio economic characteristics of the small scale sheep producers among women in the study area;
2. Determine the profitability of sheep production ; and
3. Identify constraints militating against sheep production in the study area

II. Materials and Methods

A. Study Area and Sampling Technique

The study was carried out in Kano Sate. The state was created in July, 1967. It has a total of 44 local government area and a population of about nine million with 4,947,952 male and 4,453,336 female (National Population Census - 2006) with a growth of 2.9% per annum (KNSG, 2006). There are two distinct seasons; wet season (May-September) and dry season October-April). The maximum temperature ranges between 21- 39^{o}C (KNSG, 2006). Annual rainfall ranges between 787 and 960mm (KNARDA, 1998). It is situated in Sudan savanna zone within latitude 13^{0}53'N and 10^{0}25'N and longitude 7^{0}40'E and 10^{0}53'E. Farming is the main occupation of its people, who are predominantly Hausa/Fulani engaged in production of crops like millet, sorghum, maize, cowpea, groundnut, pepper, onion, e.t.c, and rearing animals like cattle, sheep, goat, poultry, e.t.c. The promotion of agriculture in Kano State is carried out by a number of Governmental and Non Governmental Organizations. Kano State Agricultural and Rural Development Authority (KNARDA) is the technical and management unit responsible for agricultural extension of the State Government.

KNARDA divided Kano State into three administrative division called Agricultural Development Programme (ADP) zones namely, zone I, zone II and zone III with their respective local government areas (LGAs) as follows:
Zone I: Rano, Tudun wada, Doguwa, Bebeji, Kiru, Garum-malam, Kura, Kumbotso, Madobi, Gwarzo, Karaye, Rogo, Kibiya and Bunkure with Rano as ADP zone 1 Headquarter.
Zone II: Danbatta, Bichi, Bagwai, Shanono, Tsanyawa, Kunchi, Kabo, Rimi-Gada, Tofa, Dawakin Tofa, Makoda, Minjibir and Ungogo with Danbatta as ADP zone II Headquarter.

Zone III: Gaya, Ajingi, Wudil, Albasu, Garko, Takai, Sumaila, Dawakin kudu, Warawa, Gezawa, Gabasawa, Kano Municipal, Tarauni, Dala, Gwale, Fagge and Nassarawa with Gaya as ADP zone III Headquarter. Generally it is known that women in Kano State are into small scale sheep production throughout the state (KNARDA, 1998).

The multistage sampling procedure was used to collect data from all the three Agricultural zones in Kano State. In stage one, simple random sampling technique was used to select one LGA each from the three zones in which Gwarzo LGA from zone 1, Tofa LGA from zone II and Gabasawa LGA from zone III were selected. In stage two, simple random technique was used to select two villages each from the selected LGAs. Mainika and Kutama villages from Gwarzo LGA, Zango Kaba and Yansabo villages from Tofa LGA and Gurama and Zakirai from Gabasawa LGA. In stage three, purposive sampling technique was used to identify and select households where women were into sheep production using the village head as key informant and guide. All the small holder women that were into sheep production were considered. Twenty and fifteen women from Mainika and Kutama villages respectively, thirty-six and twenty three women from Zango kaba and Yansabo villages respectively and twelve and twenty four from gurama and zakirai villages respectively, thus given a total sample size of 130 respondents.

B. Data collection Procedure and Analytical Techniques

The primary data were collected with the aid of structured questionnaire bywell-trained enumerators under the guidance of the researcher. The techniques used for data analysis to achieve the stated objectives were descriptive statistics and Gross margin analysis (GMA)

Descriptive statistics.

Descriptive statistics were used to achieve objectives iand iii earlier stated. It involves the use of percentages, means and frequency distribution to analyze the socio-economics characteristics as well as their constraints in the area under study.

Gross margin analysis (GMA)

Gross margin Analysis was used to achieve objective (ii).The model for Gross margin analysis may be specified as follows:

GM = GI-TVC (1)

Where;
GM = Gross margin (in Naira per sheep)
GI = Gross income (in Naira per sheep)
TVC = Total Variable cost (in Naira per sheep)

Also Return on naira invested was also determined by dividing Gross Return (GR) by Total Variable Cost (TVC). This can be calculated as

ROI = GR/TVC (2)

Where;
ROI = Return on naira invested (in Naira per sheep)
GR = Gross Return (in Naira per sheep)
TVC = Total Variable Cost (in Naira per sheep)

(Olukosi *et al*., 2008).

Measurement of the variables

1) TVC include acquisition cost of sheep, cost of feeding, cost of medication and transportation cost

a) Acquisition cost was measured based on the average amount of which a sheep was bought or purchased in the study area.

b) Cost of feeding was measured by multiplying number of kg of feed per day with the average price per Kg

c) Cost of medication was measured by getting the amount spent on medication of sheep each month.

d) Transportation cost was measured by getting the amount spent on transporting sheep and feed yearly

2) GI was measured by getting the average price of sales of sheep

3) GR was measured by calculating the profit to get from a sheep each year which was equivalent to GM

III. Results and Discussion

A. Socio-economic Characteristics of Sheep Producers in Gwarzo, Tofa and Gabasawa L.G.As in Kano State:

Socio-economic characteristics of respondents usually assist in getting clearer understanding of their behavior as well as provide hint towards explaining their disposition that could be used to improve their productivity (Ayinde *et al*., 2007). The analysis is useful in illumination of socio-demographic setting of the productive activities as well as basic indices of human and economic development. For this study, the socio-economic characteristics considered include; age, gender, marital status, household size, educational level, experience in the sheep production, occupation(s) other than sheep production, among others.

Age group of respondents:

Age is the number of years that a person has lived on earth (Encarta dictionary, 2009). It indicated the years of life of the respondent from birth to the present time of the study. The ages of the producers ranges from 24-42 ages with mean age of 32 and standard deviation of the result is presented in Table 1.

Table 1: Socio-economic characteristics of respondents by age

Age group (year)	Frequency	Percentage	Minimum	Maximum	Mean	Standard Deviation
24-27	24	18.5	24	42	32	4.9
28-31	43	33.1				
32-35	35	26.9				
36-39	14	10.8				
40-42	14	10.8				
Total	130	100				

Source: Field survey, 2012.

The result contained in Table 1, revealed that age group 28– 31years had the highest percentage of 33.1% followed by 32 – 35 years with 26.9%, 24-27 years with 18.5% and 36-39 and 40-42 with 10.8% each. This shows that over 80% of the respondents are below the age of 40 years which means that sheep rearing is more prevalent among the young women. As most girls get married at teen- ages in the area, it can be inferred that the occupation is common among young women and become part of their in the area. Prospects of sustainability are high. This tally with the findings of Osotimehin *et al*. (2006) who reported that farmers age affect their efficiency in performing farm management decisions. Household size:

According to National Population Commission (NPC, 2006) household is a group of persons staying under the same roof or in the same house. They share the same source of food and think of themselves as a unit. The result is presented in Table 2.

Table 2: Socio-economic characteristics of respondents by household size.

Household size (numbers)	Frequency	Percentage	Minimum	Maximum	Mean	Standard Deviation
3-4	16	12.3	3	12	7	1.7
5-6	56	43.1				
7-8	42	32.3				
9-10	13	10				
11-12	3	2.3				
Total	130	100				

Source: Field survey, 2012

The results in Table 2 shows that 43.1% had the household size of 5-6 persons followed by 32.3% with 7-8; 12.3% with 3-4 members while 10% had 9-10. Only 2.3% had household size of 11-12 persons. With 75.4% of the respondents' having an average membership size of less than 8 persons it is clear the majority of the respondents have heavy family responsibility in line with the cultural expectations in the study area.This furthersuggests that family labor can be readily available for expanding sheep production. This finding is similar to (Deborah, 2011), who reported that majority of farmers (52.5%) in Kano state had 1-9 household size.

Sheep rearing experience:

This refers to the period spent in the business. Experience is very vital in any business (Darkyong, 2010). The years of experience of the respondents ranges from 6-25 years with a mean of 14 years and a standard deviation of 3.7. The result is shown in Table 3.

Table 3: Socio-economic characteristics of respondents by experience in sheep rearing

Production experience (years)	Frequency	Percentage	Minimum	Maximum	Mean	Standard Deviation
6-9	13	10	3	25	14	3.7
10-13	56	43.1				
14-17	41	31.5				
18-21	16	12.3				
22-25	4	3.1				
Total	130	100				

Source: Field survey, 2012

The result presented in Table 3 showed that 43.1% of the respondent had 10-13 years of experience in sheep production followed by those having 14– 17 years constituting 31.5%; 12.3% had 18-21 years; then 10% had 6-9 years of experience while those of 22-25 years had 3.1%.The mean years of experience of 14 indicated that most women must have started production as soon as they got married. The results further revealed that majority (74.6%) of the respondents had experience of between 10–17 years. The result was also in conformity with (Jirgi *et al.,* 2007)

Marital status:

Table 4: Socio-economic characteristics of sheep producers by marital status.

Marital status	Frequency	Percentage
Married	126	96.9
Single	-	-
Divorced	4	3.1
Total	130	100

Source: Field survey, 2012

This relates to respondent current marital status as to whether they are single, married or divorced. From the result, 96.9% of the respondents were married with only 3.1% were divorced. This shows the importance attached to marriage institution in the study area. Women are expected to get married and remain in the relationship for life. The dominance of married women in sheep production in the study area, agrees with the findings of Darkyong (2010) who noted that dominance of married people in any goat production business have positive effect on the business by raising money to cater for their large family size.

Educational level:

Table 5: Socio-economic characteristics of sheep producers by educational level.

Educational level	Frequency	Percentage
Islamic knowledge	113	86.6
Primary	17	13.1
Secondary	-	-
Tertiary	-	-
Total	130	100

Source: Field survey, 2012

This is an indicator for the ability of one to read and write (whether formal or informal). It indicates the level at which the respondent can read and write irrespective of whether formally or informally acquired. Education is important in creating positive mental attitude towards adoption of modern farming innovations (Liu *et al.*, 2003).Educational level of the respondents revealed that respondents with only Islamic education constituted the majority (86.9%) followed by primary education with 13.1%. The findings thus revealed that majority of the respondents in the study area did not have advanced formal education. This might be due to low level awareness of the importance of formal western education in any business in the area. This finding is in line with that of Muhammad and Kwali (2005) who reported that more than 60% of livestock farmers in northern Nigeria were not literate in terms of western education. The level of education of a farmer is important factor that determines the ability of the farmer to understand the policies or programmes that affects farming business, accept and adopt agricultural innovations, make timely and effective decisions and access to formal credit sources. This result also agrees with (Jirgi *et al.,* 2007) that reported that 69.30% of the respondents had education below secondary school level.

Other occupation

This explored other secondary occupation that the respondents combined with sheep production in the study area. Sheep rearers combined sheep production with other occupation to support their livelihood. Table 6 shows other occupation engaged by the respondents.

Table 6: Socio-economic characteristics of sheep producers by other occupation.

Other occupation	Frequency	Percentage
Food and food processing		
Awara selling	31	23.9
Groundnut cake selling	20	15.4
Cowpea cake selling	17	13.1
Pap selling	12	9.2
Roasted groundnut selling	9	6.9
Food selling	8	6.2
Oil selling	5	5.4
Waina selling	3	2.3
Artisants		
Hair plaiting	21	16.2
Mat selling	4	3.8
Total	130	100

Source: Field survey, 2012

The result from Table 6 shows that 23.9% of respondents combined sheep production with awara selling, 16.2% also engaged in hair plaiting, 15.4% in kose selling, 13.1% were engaged in groundnut cake

selling, 9.2% in pap selling, 6.9% for roasted g/nut selling, 6.2% for food selling, 5.4% for oil selling,3.8% for mat selling, while 2.3% for *waina* selling. These findings further suggest that women also played some key roles in the family such as engaging in more than one business so as to assist the men in bringing up the family. This result compares with that of Tayo *et al*. (2009) that reported that all respondents had other occupations alongside livestock production in Ogun State. It also agrees with the findings of Odeyinka and Okunmade (2005) that smallholder livestock production is a part time business in Oyo State.

B. Profitability of Sheep Rearing

Table 7: Costs and returns for sheep production in Gwarzo, Tofa and Gabasawa L.G.As in Kano state per year.

Component(₦)	Average value(₦/sheep/year)	%TVC
Gross income(GI)	10,829.74	-
Acquisition cost	3552.31	35.2
Feed cost	4,105.50	40.7
Medication cost	677.33	7.8
Transportation cost	391.22	4.5
Total variable cost (TVC)	8,726.36	100
Gross margin (GM)	2102.95	-
Return on naira invested (ROI)	0.24	

Source: Field survey, 2012

Table 7 showed the costs and returns associated with sheep production in the study area. It revealed the average total variable cost is₦8, 726.36 per sheep per year, while the estimated average cost of feed is N4, 105.50 accounting for 40.7% of average variable cost component. Thus the importance of feed to sheep production system is very high. Diego (1994) had stated that feed, whether purchased or produced on the farm make up a large part of the expense incurred in ruminants' production. It is followed by acquisition cost of young ewe which averaged₦3, 552.31 representing 35.2 %; N677.33was spent on medication (7.8%) of the total variable cost of production, followedby transportation cost that amounted to ₦391.22 representing 4.5%per sheep per year. Fixed cost was negligible in sheep production. The average revenue per sheep among women in the study area was found to be ₦10, 829.74. The analysis showed that gross margin per sheep per year was ₦2102.95 and return on naira invested was ₦ 0.24. Hence the cost and return analysis indicated that sheep production among women in the study area was profitable. The result is in conformity with Daniel (2007) that estimated a Gross margin to be ₦16, 536.00 for an average of six sheep flock.

This result is also in line with Haliru (2011) that had a net return of ₦1, 342.36 in sheep marketing in Katsina State per cycle of a rate of return of 0.12.

C. Constraints and Solutions to Sheep Rearing in the Study Area

The major constraints that militated against sheep production as well as the solutions preferred by the respondents in the study area were presented and analyzed in Table 8 and 9.

Major constraints to sheep rearing

The major constraints are those problems militating against sheep production in the study area. The respondents identified some major problems which include inadequate capital, water shortages, inadequate feed and diseases problem. The result is presented in Table 8.

Table 8: Distribution of respondents according to the major problems affecting production

Problems affecting production	Frequency	Percentage
Inadequate capital	37	28.5
Water shortages	22	16.5
Inadequate feed	26	20
Diseases problem	35	26.9
Total	130	100

Source: Field survey, 2012

Table 8 shows that majority of the respondents (28.5%) cited inadequate capital as their major problem in sheep production; followed by 26.9% citing diseases incidence; 20% cited inadequate feed while the remaining 16.9 % had water shortages as significant problem. This result is in line with the report of Doma *et al*. (1999), that the major problems of livestock production in Nigeria include housing, health care and feeding management. The result also agrees with the report of Ajala (2004) that high disease incidences are some of the major constraints associated with small ruminant production.

Solution to the major constraints of sheep rearing

The respondents indicated some proffered solutions to the problems of sheep production in the study area which include improved access to capital, adequate feed, reduction in the cost of drug and vaccination and availability of water at all times. The solution to the major constraints of sheep rearing by the respondents is presented in Table 9.

Table 9: Distribution of respondents according to proposed solutions offered to solve the problems

Solutions to the problem of sheep production	Frequency	Percentage
Access to capital	47	36.5
Adequate feed	22	16.9
Reduction in cost of drug and vaccination	41	31.5
Availability of water at all times	20	15.4
Total	130	100

Source: Field survey, 2012

Table 9 showed that majority of the respondents (36.5%) were of the opinion that access to capital to boost their production was the solution of sheep rearing problem, 31.5% was of the opinion that there should be reduction in the cost of drugs and vaccination, 16.9% are of the opinion that there should be adequate feed to be provided by government while 15.4% was of the opinion

that availability of water at all times was the solution to the problem of sheep rearing in the area.

IV. Conclusion

The sheep rearing analysis in the study area revealed that young women aged (28-31) constituted the majority of the producers which forecasts are prospective future for sheep production and had low level of western education. Sheep rearing as the study revealed was profitable though mainly as a traditional way of life. Constraints which militated against increase in profitability in sheep rearing include inadequate capital, disease incidences, inadequate feeds and low access to information and technology usually provided by extension services in the area. Sheep rearing could be effectively used as a vehicle for eradicating poverty among women in the area studied.

Recommendations

The following recommendations were made based on the findings of the study as an attempt to solve problems which include:

- There should be massive campaign to create awareness of the importance of western education to improve literacy and acquire production skill for women sheep rearers given that the majority are young and had acquired considerable experience in traditional sheep husbandry. Provision of mass education for women sheep rearers by relevant extension agencies, NGOs and communities should be explored by stakeholders and new development package suitable for the area should be design.
- Linkage to financial institutions should be explored so as to provide access to production loans for resource poor women to improve their capital base and savings capacilities
- Women sheep rearers should be encouraged to form cooperatives for the purpose of self-reliance to improve access to key input and improve marketing outlet for enhanced profits.

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