

MANAGEMENT PRACTICES AND CONSTRAINTS OF SHEEP FARMERS IN SOKOTO STATE, NORTHWESTERN NIGERIA

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Abstract: A study was conducted in Sokoto, northwestern part of Nigeria to assess the sheep production system and the major constraints faced by farmers in the management of their sheep flocks. The survey was done in some selected districts/wards. Majority of the farmers sourced their stock from the open market and none indicated to have sourced from institutional farms where modern breeding techniques are employed. Flock size ranged from 5 – 50 animals (mean flock size was 12.8). Fifty eight percent of the farmers rear purely uda breed and more breeding ewes were kept than males. Sheep are kept for generating family income, for use during religious/traditional rites, meat and milk in that order. Farmers had preference for keeping particular breed of sheep for varied reasons which included multiple births, adaptation to environment, good temperament, good mothering ability and lactation. Major drawbacks identified as hampering the productivity of the sheep production in the area were high cost of feeds, seasonality of feeds, inadequate extension services, disease and vaccination problems and the high cost of veterinary care.

Key words: Family income, sheep production, semi-intensive, small holder.

INTRODUCTION

Tropical Africa has about 22% and 17% of the total world sheep and goat population of 1,028 million and 765 million respectively (Tibbo 2000; LDC 2002; Chantalakhana and Skunnum 2002; Nwafor 2004). Nigeria is home to about 22.1 million sheep and about 70% of the small ruminants are found in the semi-arid zones of Nigeria and these belong to the agro-pastoral farmers utilizing extensive and semi-intensive management systems (Ajala et al. 2003; Mbilu 2007). Whilst, majority of the sheep population in the country are owned by small-holder rural livestock farmers, a few are still in the urban areas (Sanni et al. 2004; Mbilu 2007). Sheep and goats constitute a good source of family income and livelihood, assets and agricultural resources for smallholder farmers (Iyayi and Tona 2004; Shittu et al. 2008; Salem-Ben and Smith 2008). This makes small ruminant farming an important and secured form of agricultural investment to the Nigerian rural and urban farmers. This observation was further buttressed by Ingawa (1986), who reported that livestock and livestock products

particularly from small ruminants accounted for 56% in value terms (income) in typical smallholder mixed farming settings. This again underlines the valuable contribution of small ruminants as income generating assets among small-holder livestock farmers (Mbilu 2007; Shittu et al. 2008). They are kept mainly as a secondary investment and require minimal input.

Integration of sheep with crop agriculture usually occurs under subsistence conditions on small-scale farmers. They form an integral part of the system, providing milk, meat, manure and cash to the farm family during the time of need. Sheep and goats are efficiently reared on marginal lands and are good users of crop residues (Fakoya 2002; Sanni et al. 2004). As such, they provide the only practical means of using vast areas of natural grasslands in regions, where crop production is almost impracticable (Ngatazie 1989; Rege 2001). Small ruminants have been reported to be prolific (Otchere 1986) and need only short gestation periods to increase flock size. This therefore makes traditional small ruminant production system a low input but high output enterprise with predictable profitability and economic returns (Nwafor 2004).

Sheep contribute enormously to the protein requirements of most developing countries (Mandal et al. 2007; Muhammad et al. 2008). In Sub-saharan Africa, sheep provide almost 30% of the meat consumed and around 16% of the milk produced. David-West (1985) estimated that sheep and goats contribute about 35% of the total animal meat production in Nigeria. This ranks small ruminants as the second most important suppliers of meat protein to the population after cattle (Maigandi 2001; Ajala et al. 2003; Ugwu 2004).

Despite the enormous contributions of the small holder farmer to the Nigeria's livestock economy and development programs, and in spite of the special attributes possessed by small ruminants, the productivity potential of these animals is yet to be fully exploited (Maigandi 2001; Aye 2004; Magaji, 2004). Some of these productivity attributes include the ability of small ruminants to highly adapt to a broad range of environments utilizing a wide variety of plant species (Aye 2004; Ugwu 2004; Nwafor 2004), as well as not being prone to high feed competition with other species like cattle and camels (Rege 2001; Gatenby 2002). Due to their short generation time (gestation period) and high fecundity (Otchere 1986), sheep are generally known to have high production efficiency. During periods of unpredictable food shortage, sheep have proven very useful to human beings in the supply of meat and milk products (Gatenby 2002; Iyayi and Tona 2004). This study was aimed at assessing the management practices of sheep production in terms of source of flock, feeds and feeding,

flock size, herd structure, reasons for keeping sheep as well as the major constraints to production in the study area.

MATERIALS AND METHODS

Study Area

The study was conducted in Sokoto state, which is located in the extreme Northwestern part of Nigeria. The state geographically lies along longitude 11° 30' to 13° 50' East and latitudes 4° to 6° North and covers a total land mass of 26,648.48 square kilometers. Sokoto state shares boundary with Kebbi state to the south and Zamfara state to the east. It also has boundary with the Republic of Niger to the north. The state has an estimated human population of 3,696,999 million based on the 2006 population census with 97.7 persons per square kilometer (NPC, 2006). There are 23 local government councils (LGC) in the state with Sokoto as the capital (Fig. 1).

The climate of the state is semi-arid with two major distinct seasons, namely, the wet and dry seasons. The wet season starts from late May and ends in early September but could extend to October with a mean annual rainfall of between 500 mm and 1300 mm. Peak rainfall is reached in August. Dry season starts from October with the cold, dry, dust- laden harmattan wind lasting till February. Between the months of March to May, the weather is hot and dry with temperatures reaching 38°C - 42°C during the day with relative humidity less than 20% (Abdullahi 1985; Tambuwal 2009). In terms of vegetation, Sokoto state falls within the Sudano-Savannah vegetation zone, which is suitable for cultivation of grains, cash crops and animal husbandry. The state is a major livestock producer and is second only to Borno state in livestock population. It has an estimated cattle population of 2.4 million, 2.90 million goats, 45,000 camels, 3.4 million poultry and sheep population which is estimated at 1,988,629 (MOCIT 2002; PACE 2003). The famous Hausa plains of Northern Nigeria dominate the landscape of the state. The vast fadama land of the Sokoto Rima River dissects the soil and made it fit for a variety of crop cultivation. There are also isolated hills and mountain ranges scattered all over the state. The major occupation of the vast majority of the population of the state is arable farming as well as livestock rearing. Cattle, sheep and goats are the principal ruminant animals reared, although camels and poultry are also important.

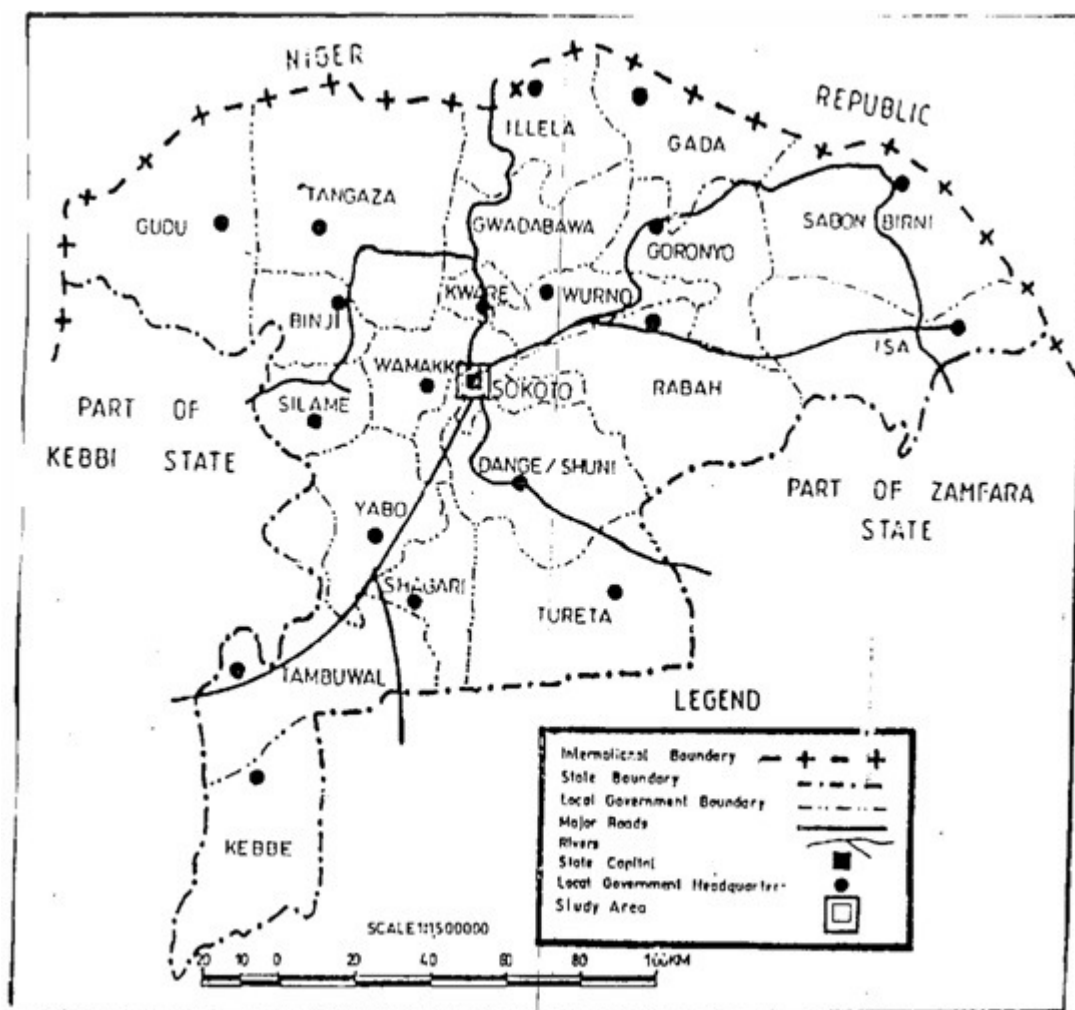


Figure 3.1 Map of Sokoto State showing the local government areas

Sampling Frame

The state has four agricultural zones namely: Gwadabawa, Isa, Sokoto and Tambuwal zones. Each zone has between 5 - 6 local governments' areas (Junaidu 2005). For the purpose of this study, and to ensure a good representation in the administration of questionnaires, two local governments from each were randomly selected by balloting using simple random sampling technique. Simple random sampling was further used to select the wards in the selected local governments. This was followed by identifying the sheep flocks in each of the local government areas selected, using records from the Ministry of Animal Health and the local government agricultural departments. Relevant information was also obtained from the ward heads and other sheep stock owners.

Two hundred and eighty (280) close ended questionnaires were distributed out to flock owners in the selected local governments. In some instances, due to the literacy level of some of the sheep owners, some questionnaires were also administered through the assistance of

livestock attendants who recorded the responses. The administration of the questionnaires spanned over a period of six months from November, 2006 to April, 2007. Information gathered using the questionnaire included *inter-alia* breeds of sheep, sources of stock, flock size, management system, age and sex distribution of the flocks. Others were reasons for keeping sheep, knowledge and utilization of veterinary care, common prevalent diseases encountered, constraints faced by farmers as well as the required solutions to those constraints.

Data Analysis

Data generated from the various this survey were presented as tables, figures and percentages.

Results and Discussion

Management systems and practices

The system of agricultural production in the area is predominantly a mixture of crop-livestock system with respondents cultivating cereal crops as well as keeping animals side by side. This is a system that has been well reported by several authors (Hassan 2003; Sanni et al. 2004). Analysis of the sheep management system in the area indicated that 144 (59.50%) of the respondents kept their sheep under semi-intensive system of management, followed 89 (36.80%) who practice extensive system. Only 9 (3.70%) respondents practice intensive system (Table 1).

Table 1: Sheep management system based on agricultural zones in Sokoto state

Management System	Agricultural Zones				Total	
	Gwadabawa (%)	Isa	Sokoto	Tambuwal		
Extensive	29 (43.94)	14 (22.22)	25 (48.08)	21 (34.43)	89	(36.80)
Semi-Intensive	36 (54.54)	45 (71.43)	26 (50.10)	37 (60.65)	144	(59.50)
Intensive	1 (1.52)	4 (6.35)	1 (1.92)	3 (4.92)	9	(3.70)
Total	66 (27.27)	63 (26.03)	52 (21.49)	61 (25.21)	242	(100)

() Figures in brackets are percentages

This finding agrees with that of Hassan (2000) but is in contrast to the result of Odeyinka et al. (2008) who posited that 62% of farmers in his study practice extensive system as against

29% who kept their sheep under semi-intensive system of management. The variation may be explained by the relative importance to which sheep production is given in this area of study compared to that of Odeyinka et al. (2008). Here in Sokoto state, rams are kept and offered some supplementary feeding for fattening and sold off during religious occasions at which time high premium is attached to these animals, hence the intensification so as to achieve the desired result.

Source of and composition of Flocks.

From the study undertaken, 178 (68.46%) respondents sourced their stock from the market while 59 (27.7%) obtained their sheep from the nomadic Fulani pastoralists. Some 19 (7.31%) respondents and another 3 acquired their stock from gift/inheritance and backyard holdings respectively. The relative ease with which farmers could purchase their animals from the market might have accounted for its being a preferred source of stock. Alternatively, it may be a cheaper source and trade point for a variety of sheep choices (Table 2).

Table 2: Source and acquisition of flocks according to agricultural zones in Sokoto state

Source	Agricultural Zones				Total
	Gwadabawa	Isa	Sokoto	Tambuwal	
Backyard	0	3	0	0	3
Govt Institution	0	0	0	0	0
Nomadic Fulani	21	6	17	15	59
Market	44	53	43	38	178
Gift/inheritance	3	8	6	2	19
Combination	1	0	0	0	1
Total	69	70	66	55	260*

(*) Multiple responses

In the study, flock sizes ranged from 5 animals to over 50 per flock with a high percentage of the respondents 71.20% keeping between 6–20 animals. This clearly indicates that small-holder sheep production is common in the state. This is consistent with the observations of Odeyinka et al. 2008 in Ekiti state. The relatively small sizes of flocks as seen in the present study can be explained by the management system practiced in the study areas which is predominantly extensive or semi intensive in nature (Shittu et al. 2008). Moreover, within the socio-economic context in which the farmers operate, flock numbers are usually low because

they can be better managed and also it is within the capabilities of women and children who generally provide much of the labour required for easy expansion of their flocks (Bayer and Bayer 1991; Charry et al. 1992)

Purpose of Keeping Sheep

Small ruminants play a significant role in the life of man whether in the rural or urban areas in a variety of ways. From the results of the four agricultural zones in this study, the predominant reason for keeping sheep by majority of the farmers (54.5%) is as a source of money to supplement family income. Some (34.8%) of farmers kept sheep for use during traditional/traditional festivities and only 10% of the respondents actually raised sheep for direct consumption. The result shows that most farmers keep sheep for sales in order to meet family expenditures (Table 3). This finding is similar with that of Osikabor et al. (2004), Getachew et al. (2010) and Gebretsadik et al. (2012). Such animals are sold to raise money needed to pay off loan, purchase farm inputs like fertilizer and other household needs, replace large ruminants, even pay the school fees of children and to solve other immediate family needs. Small ruminant farming and in particular sheep farming, can thus be said to be profitable in this study area.

Table 3. Reasons for keeping sheep among flock owners in Sokoto state

Reason	Frequency*	Total/%
Source of meat	38	10.2%
Source of milk	2	0.5%
Future market sales	204	54.5%
Festivities	130	34.8%
Total	374	100.0%

*Multiple responses.

Housing type provided

Information on the type of housing provided for their flocks showed 62.81% of farmers from all the zones provided fenced areas around their compounds or backyard as housing for their flocks. This finding is in consonance with the earlier reports of Hassan (2000), Sani et al. (2004) as well as Mekuriaw et al. (2012). Fenced areas are provided during the day to prevent animals from going into farmlands during the cropping season to avoid damage to crops. However, according to Hassan 2000, these structures can hardly protect animals from the harsh weather condition during the cold harmattan season and the intense heat during hot

season. On the other hand, 35.13% of the farmers allowed their sheep to roam and graze freely. This is characteristics of extensive system of management and in these situations, there is no input into feeding and veterinary health.

Feeds and feeding of sheep

On the type of feeds offered to their sheep, it was found out that 36.91%, 43.08%, 32.73% and 32.35% of the farmers from the respective zones (Gwadabawa, Isa, Sokoto and Tambuwal) indicated supplementing their animal feeds with mixture of concentrate plus hay, legume and crop residues. Additionally, fresh forage is also been cut (cut and carry) and fed to the animals especially during rainy season. This outcome suggests that the farmers have some knowledge of intensification of their stock, particularly since the practice of fattening of rams for future market sales is a common practice in the area (Charry et al. 1992). Besides, as indicated by Muhammad et al 2008, the scarcity of forage and drinking water during the long dry season makes it imperative for farmers to look for ways of supplementing their animals for better performance and growth.

Diseases encountered

The findings emanating from this study indicated that the major common diseases encountered in various flocks in order of significance were helminthosis, diarrhea, pneumonia and abortions (Table 4). No farmer reported any history or record of vaccination against diseases in small ruminants in the study area. Although a high majority of farmers claimed to be consulting veterinary doctors to treat their sick animals, the high prevalence of these conditions in this study area could be as a result of poor management and lack of veterinary health care given to the animals in those flocks. The doctors consulted may not necessarily be doctors but just veterinary staff (para- veterinary staff). This, thus, underscores the need for improved veterinary health care inputs which as reported by Muhammad et al. (2008) in the study area, is grossly inadequate among farmers. Studies by Adebowale et al. (1992) and Iyayi and Tona (2004) in other areas indicated that mange, diarrhea and foot and mouth disease were commonest conditions affecting sheep. This is in contrast with the present study and could be attributed to differences in the geographical location and therefore climate of the two study areas.

Table 4. Common diseases/conditions of sheep encountered in various agricultural zones in Sokoto State

Diseases	Agricultural Zones				Total (%)
	Gwadabawa	Isa	Sokoto	Tambuwal	
Pneumonia	44 (23.91)	39 (27.66)	17 (11.57)	38 (19.39)	138 (20.66)
Abortion	23 (12.50)	12 (8.51)	18 (12.24)	26 (13.26)	79 (11.83)
Helminthosis	43 (23.36)	49 (34.75)	30 (20.41)	47 (24.00)	169 (25.30)
Trypanosomiasis	0 (0.00)	2 (1.42)	1 (0.68)	0 (0.00)	3 (0.45)
Sheep pox	4 (2.20)	1 (0.71)	13 (8.84)	17 (8.67)	35 (5.24)
Toxaemia	10 (5.43)	11 (7.80)	10 (6.80)	13 (6.63)	44 (96.59)
Mastitis	8 (4.43)	2 (1.42)	17 (11.57)	17 (8.67)	44 (6.59)
PPR	3 (1.63)	4 (2.84)	0 (0.00)	9 (4.59)	16 (2.39)
Diarrhoea	49 (23.63)	21 (14.89)	41 (27.89)	29 (14.79)	140 (20.59)
Total	184	141	147	196	*668

*Multiple responses; Figures in () are percentages.

Constraints and possible remedies to sheep farming in area of study

An array of factors were perceived and presented by the respondents in the study area as being the major constraints to sheep production. These constraints included cost of feed (19.6%), seasonality of feed (17.7%), inadequate extension services (14.9%), disease and vaccination problem (14.2%), cost of veterinary care (11.5%) and weather/climate (10.0%). These findings agree with the reports of Hassan 2000; Iyayi and Tona 2004; Muhammad et al. (2008) as well as Shittu et al. (2008) who identified these factors as constraints to sheep production in Nigeria as well as in the tropics (Kosgey et al. 2008). Other constraints listed by farmers included scarcity of water, thefts and accidents and scavengers. These constraints could be addressed collectively by farmers coming together to form cooperatives groups with the assistance of government.

Possible solutions to these constraints proffered by sheep farmers included improved veterinary health care services, improved extension service, provision of feed sources and soft loan from government. The majority of farmers in the study indicated that they require improved veterinary health care services. This underscores the need for improvement in veterinary extension services.

Table 5. Major constraints faced by flock owners in Sokoto state

Constraints	Frequency*	Total (%)
Cost of feed	171	19.6
Cost of veterinary care	100	11.5
Seasonality of feed	154	17.7
Weather/climate	87	10.0
Scarcity of water	10	1.1
Inadequate extension service	130	14.9
Disease/vaccination problem	124	14.2
Thefts and accidents	80	9.2
Combination of 1 & 3	7	0.8
Scavengers	9	1.0
Total	872	100

*Multiple responses

Table 6. Inputs required by farmers across Sokoto state for improved sheep husbandry

Input	Frequencies	% Total
Improved extension service	149	20.8
More grazing areas	98	13.7
Subsidized feeds	148	20.7
Enlightment on sheep milk consumption	10	1.4
Sheep multiplication centers	5	0.7
Soft loans	115	16.1
Improved veterinary health care	166	23.2
Subsidized drugs	25	3.5
Total	716	100

Conclusions

The sheep production system is predominantly extensive and semi-intensive in the study area. Under these systems of production, inputs into veterinary health care and nutrition of animals are grossly inadequate. This coupled with the prolonged dry season means that sheep are inadequately fed culminating into malnutrition and limiting the ability of these animals to bear and foster lambs. Major constraints such as high cost of feed, seasonality of feeds, inadequate extension service that sheep owners faced and militates against their ability to manage their sheep in Sokoto state were identified, so also were the possible solutions like better extension services, subsidized veterinary drugs and soft loans that could help the farmers alleviate these constraints.

Recommendations

- The process of providing of extension services need to be strengthened at the local level so that sheep owners can get access to information on ways of rearing and improving their flock management.
- Government needs to find ways of developing low- interest credit and inputs supply arrangement/scheme that those farmers can easily access.
- Sheep farmers need to be encouraged to form cooperative societies so that they can constitute a formidable group that can approach government agencies on the way forward in addressing their major problems.

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