



Pattern of small ruminants ownership and management by agro-pastoralists within peri-urban Kano, semi-arid - Nigeria

Garba Y.^{1*}, I. R. Muhammad² and A. Suleiman³

¹Centre for Dryland Agriculture, Bayero University, Kano, Nigeria.

²Department of Animal Science, Bayero University, Kano, Nigeria.

³Department of Agricultural Economics and Extension, Bayero University, Kano, Nigeria.

Article History

Received 23 September, 2015

Received in revised form 23 October, 2015

Accepted 28 October, 2015

Keywords:

Agro-pastoralists,
Small ruminants,
Semi-intensive system,
Semi-arid region.

Article Type:

Full Length Research Article

ABSTRACT

A diagnostic survey using the multi-stage sampling technique based on high concentration of agro-pastoralists was used to elicit information on the demographic characteristics of agro-pastoralists, small ruminant ownership and production systems in peri-urban, semi-arid areas of Kano State, Nigeria. A total sample size of 200 farmers was used. The results obtained reveal that 88% of the farmers were males within the ages of 21 to 30 years. Production experience was acquired mainly through inheritance. However evidence of diverse occupations among the respondents were observed. The semi-intensive system is being practiced and the choice of management is attributed to convenience (28%) and low management cost (22%). The major sources of sheep and goat acquisition were through purchase (61 and 38%) and gift (14 and 28%) for sheep and goat, respectively. The reasons for rearing were to meet supply during festive periods, when there is high demand of sheep (45%). While for goats, it was due to ease of rearing (61%). It is concluded that small ruminant rearing is practiced by all age groups and gender. Thus, opportunities for improvement interventions are to be targeted at all age groups and gender since the younger generation will inherit the production practices along with any improvement technology. It is however recommended that livestock improvement strategies for sheep should be propagated during festive periods while that on goat should be year-round.

©2015 BluePen Journals Ltd. All rights reserved

INTRODUCTION

The structure of the Nigerian livestock industry is such that 80-90% of the nation's livestock lies in the hand of small-holders or other traditional groups (Olaloku, 1999). Subsistence animal agriculture is the main contributor to the meat industry in Nigeria. This consists of small herds and flocks in the rural, urban and peri-urban areas (Momoh and Ochaba, 2002).

Njoku (2005) reported that 99.75% of cattle, 99.97% of

goats, 99.84% of sheep, 90.75% of pigs and 86.17% of chickens in Nigeria are traditionally managed. These figures indicate that more than half of Nigeria's livestock is managed traditionally. Any effort to raise the level of meat production in the country must take into consideration these farming communities.

Shaib et al., (1997) reported that there is a pressing need to increase the production of domestic animals, which are conventional sources of animal protein, such as the small ruminants, to overcome the acute shortage of animal protein in the diet of the average Nigerian. Goats play an important socio-economic role in the rural areas, where most of the poor farmers in Africa live. The

*Corresponding author. E-mail: ygarba.cda@buk.edu.ng, yugarba@yahoo.com.

role of goats in traditional areas has been highlighted (Wilson, 1988). Small ruminants have been reported to form an integral part of the cultural life and system of Nigeria's peasantry (Ajala, 2004). Small-scale farmers keep small ruminants for both subsistence and economic reasons. In either role, they generally improve household livelihoods. Small ruminants contribute to landless, rural farming, peri-urban; and increasingly to urban households by providing food, meat, income, socio-cultural wealth and clothing. They also make important indirect contributions to households through the use of crop by-products, integration with other farming enterprises, use of household wastes and locally grown vegetation, soil fertility improvements and their roles in the social, cultural and religious aspects of everyday life. In particular they contribute to the empowerment of women and of children who often have responsibility for the management, production and health of small ruminants.

Small ruminant production is typically a small-scale farmer activity attracting minimum investment in housing, feed and health care and is largely sustained by the potential of the individual breeds themselves relative to large ruminants.

In order to optimize outputs from this important production system, a systematic identification and analysis of production variables and constraints would have to be undertaken. Therefore, the objectives of this study were to describe small ruminant production systems of selected Local Governments Areas in Kano State; to identify the opportunities and constraints of small ruminant production; as well as make recommendations to improve the system.

MATERIALS AND METHODS

Study area

The study was conducted in Kano State. Kano lies between longitude 9°30' and 12°30' North and latitude 9°30' and 8°42'; East characterized by tropical wet and dry climate. Kano State has three types of vegetation. From the extreme south is the Northern Guinea Savannah; in the central part lies the Sudan Savannah; and the strip of Sahelian vegetation belt found in the extreme northern part of the State forms the third. The vegetation type is composed of a variety of trees, grasses and shrubs scattered over an expanse of grasslands (Ahmed, 1998). Kano receives on average of 690 mm of precipitation per year; the bulk of which falls from June through September. The temperature both on diurnal and annual range is slightly above 30°C (K-SEEDS, 2004). These climatic conditions are quite conducive for livestock rearing.

Livestock species reared include both domesticated

and non-domesticated ruminants, non-ruminants and avian species. The popular animal system husbandry practiced is the semi-intensive system of management where animals are allowed to graze during the day and return in the evenings where they are housed with occasional supplementation with concentrated feed.

Sampling technique

A multi-stage sampling technique was employed to select two hundred agro-pastoralists. The first stage involved selection of five Local Government Areas (LGAs) (Makoda, Karaye, Takai, Gabasawa and Rano) purposively based on availability of large number of agro-pastoralists from the 44 LGAs in Kano State. In the second stage eight villages were purposively selected from each of the LGAs based on high concentration of agro-pastoralists in the areas and finally, five households of agro-pastoralists were randomly selected within each of the selected villages, giving a total sample size of 200.

Data collection

The instrument used for data collection was structured questionnaires. Primary data was collected by the administration of semi-structured questionnaires to the agro-pastoral farmers in the study area. Data collected included demographic information on the respondents, management practices used, flock and herd size, choice of management system, sources of feed and stock, and preference for a particular species.

Data analysis

The data collected were analyzed using descriptive statistics specifically, frequencies and percentages using the Statistical Package for Social Sciences (SPSS) 16.0 for Windows (2007).

RESULTS AND DISCUSSION

Demographic information of agro-pastoralists

The biodata of the respondents is presented in Table 1. The results obtained reveal that majority (88%) of the owners were males. Respondents were aged between 10 and 20 years, and above 50 years; with the majority within the age bracket of 21 to 30 years. This indicates that high proportions of the respondents were of the middle age, active and involved in small ruminant production. This shows that, small ruminant production is an adult dominated activity in the study area.

Table 1. Demographic information of small ruminant agro-pastoralists in semi-arid areas of Kano, Nigeria.

Variable	Frequency	Percentage
Gender		
Male	175	87.50
Female	25	12.50
Age (years)		
10 – 20	23	11.50
21 – 30	70	35.00
31 – 40	44	22.00
41 – 50	38	19.00
51 – 60	25	12.50
Marital Status		
Single	56	28.00
Married	137	68.50
Widowed	04	2.00
Divorced	03	1.50
Educational Status		
Informal Quranic School	107	53.50
Primary School	20	10.00
Secondary School	34	17.00
Tertiary Education	19	9.50
Adult Education / literacy	04	2.00
Informal Quranic and Primary School	06	3.00
Informal Quranic and Secondary School	04	2.00
None	06	3.00
Occupation		
Crop Farming	02	1.00
Livestock Rearing	34	17.00
Crop and Livestock farming	137	68.50
Trading	01	5.00
Crop, Livestock farming and Trading	11	5.50
Livestock farming and Trading	01	0.50
Civil servant	11	5.50
Student	03	1.50
Duration in Livestock Farming (years)		
1 – 5	30	15.00
6 – 10	36	18.00
11 – 15	46	23.00
16 – 20	48	24.00
21 – 25	40	20.00

A primary goal of testing livestock interventions is by encountering target audience that will accept and get it adopted. Data obtained in the study with regards to demographic information revealed that agro-pastoral farmers could be good potential technology adopters. Evidence at hand indicated both male and female, all categories of ages, marital status, educational background and involvement and the duration in the occupation all had participants. This finding is in agreement with reports by Garba and Muhammad (2008) who reported similar results. Furthermore, there will be no gap in training within the system, though skill acquisition may be by inheritance since all ages examined were involved in the production system. This also implies that there abound potentials for improved production practices since individuals within the active age group are expected to be more receptive to new technological innovations. Majority of the respondents were married and had either religious or western education.

Irrespective of marital status of the agro-pastoralists, all categories indicated some degree of independence in terms of earning a livelihood and perhaps provide complimentary labour within the household. This may explain why all respondents were involved in sheep and goat rearing.

Although education enables individuals to gain knowledge and skill and thus increases their power of understanding, it seems that experience rather than education, helps the stock owners in their managerial ability (Garba and Muhammad, 2008; Sodiya et al., 2008).

However, for the purpose of adopting new technologies, western education is an important factor which if lacking can impact adversely on future small ruminant production.

However, most of the respondents (54%) had acquired informal quranic education. It could therefore be inferred that the agro-pastoralists are predominantly literate. The fact that majority of the respondents had one form of literacy level or the other could infer that awareness or introduction of new technologies may only require translation to enhance their understanding. Communication may only be challenging with a meagre proportion of the respondents.

Most of the respondents (69%) were crop farmers and livestock keepers. There is however evidence of diverse occupations and holding back to traditional practices is getting diluted above 20 years experience in livestock rearing. Production experience is acquired or inherited in early years of life to more than 20 years. This practice suggests that any intervention accepted could be sustained since the younger generation will inherit the production practices along with any adopted technology.

Occupation is much diversified within other areas of livelihood yet with some form of small ruminant rearing.

Majority of the respondents being crop and livestock farmers simply points to the fact that mixed farming which comprise crop and livestock farming is the predominant occupation of the inhabitants of the study area. This is in harmony with the reports of Otchere et al. (1987) and Muhammad et al. (2007). There is perhaps high likelihood of soil fertility management in such setting because of manure to be produced by the small ruminants (Jabbar, 1993).

Findings that individuals, mainly traders, civil servants and students are engaged in livestock rearing is an indication that small ruminant production is an occupation that could be practiced by all as it requires little expertise and skills in terms of husbandry practices. Majority of the respondents having greater than 20 years experience in livestock rearing is a clear pointer that it is an occupation that has strong socio-cultural lineage with the pastoralist because it is an occupation that is passed down from one generation to another. This is in agreement with report by Yisehak (2008). It could therefore be inferred from this study that any intervention towards improvement of small ruminant production system has to take into cognizance the socio-cultural norms and values of the agro-pastoralists.

Livestock management system by agro-pastoralists

The management system practiced by the respondents is presented in Table 2. Agro-pastoral farmers encountered kept either sheep or goats. A larger proportion (72%) of the respondents kept a combination of both sheep and goat. Majority of the respondents (75%; 72%) had between 1 and 10 flock and herd size of sheep and goat, respectively. The management systems practiced were semi-intensive (42%) and intensive system (20%). The semi-intensive system of management being more popular could be used to deduce that agro-pastoral farmers practice semi-intensive livestock production since they have homesteads, practice some crop farming and livestock rearing as this is a good opportunity for provision of housing and supplementary feeds.

The use of crop-residues and purchase of supplements being the major sources of feeds, further infers that crop-livestock linkage approach (as semi-intensive) qualified the production system as a veritable means of improving livestock productivity in the study area.

Many of the respondents (30%) indicated the use of the semi-intensive system of production as a tradition inherited from previous generations. Other comparatively relevant production practices encountered were attributed to convenience (28%) and low management cost (22%) of the operations. Sources of feeds for livestock as reported by respondents was mainly from crop residues and purchase of supplements (42%) while only 16% of the respondents reported cut and carry as their major

Table 2. Management of small ruminants by agro-pastoralists in semi-arid areas of Kano, Nigeria.

Variable	Frequency	Percentage
Species kept		
Sheep	14	7.00
Goat	42	20.90
Sheep and Goat	144	71.60
Flock size		
1 - 10	149	74.50
11 - 20	34	17.00
21 - 30	09	4.50
31 - 40	04	2.00
41 - 50	04	2.00
Herd size		
1 - 10	143	71.50
11 - 20	44	22.00
21 - 30	09	4.50
31 - 40	02	1.00
41 - 50	02	1.00
Management system practiced		
Intensive	40	20.00
Semi – intensive	83	41.50
Extensive	77	38.50
Reason for choice of semi-intensive management system		
Convenience	55	27.50
Low management cost	43	21.50
Tradition	59	29.50
More secured	02	1.00
Convenience and Low management cost	16	8.00
Low management cost and Tradition	07	3.50
Convenience and Tradition	15	7.50
Convenience , Low management cost, Tradition, More secured	03	1.50
Source of feeds		
Crop residues	46	23.00
Purchase of feeds	40	20.00
Crop residues and purchase of feeds	83	41.50
Cut and carry	31	15.50

source of livestock feed.

Sources of stock for agro-pastoralists

Table 3 shows the sources and reasons for keeping particular species of small ruminants by the respondents. The results obtained reveal that most of the agro-pastoralists obtained their stock through purchase in both sheep (61%) and goat (38%), respectively. However, a high proportion (28%) of the respondents reported gift as a source of their goats (relative to the sheep species). Acquisition by inheritance as a source of stock was low in

both species. On the other hand, a high proportion of the respondents attributed festive purposes (45%) as their motive for keeping sheep, while goats were mainly kept due to ease of rearing (61%) and their prolific nature (43%). High demand and ease of disposal were more recognized by sheep farmers (20%) as a preference attribute, hardiness (19%) and ease of disposal were prominent in preference for keeping goats. Livestock acquisition being mainly through purchase indicates that livestock resources are highly valued in the study area. However, gift is a common practice but relative to sheep. Preference for sheep due to festive purposes is attributable to the large number of Islamic adherents

Table 3. Sources of stock and reasons for keeping small ruminants by agro-pastoralists.

Variable	Sheep (%)	Goat (%)
Source of Stock		
Inheritance	14.50 (29)	14.50 (29)
Purchase	61.00 (122)	37.50 (75)
Gift	14.00 (28)	28.00 (56)
Reason for Keeping		
Easy to Keep	37.50 (75)	61.00 (122)
Hardiness	0.50 (01)	19.00 (38)
High Demand	20.00 (40)	4.00 (08)
Festive Purpose	44.50 (89)	6.50 (13)
Prolificacy	13.50 (27)	42.50 (85)
Ease of Disposal	20.50 (41)	17.00 (34)

in the study area; who normally slaughter sheep (ram) for the *Eid-el-kabir*, naming and other celebrations. Other good features noted for sheep keeping were high demand and ease of disposal. On the other hand, the goat species being kept mainly due to relative ease of management, hardiness and prolificacy could be linked to the fact that the goat species serves as risk averters and income generator in times of crop failure or financial crunch in the traditional African production system. However, a high proportion of the respondents reported gift as source of goats (28%) and sheep (14%) while the case of inheritance as a source of stock was low.

Conclusion

It is concluded that sheep and goat rearing is practiced by all age groups and gender most of whom were literate. The production system involves the semi-intensive system of management. This practice was inherited and convenient in terms of labour and capital requirements. Sheep were mainly reared for disposal during festive seasons while the goats on the other hand were reared primarily as risk averters. It is however recommended that livestock improvement strategies for sheep should be propagated during festive periods while that on goat could be year-round. Also, these enterprises could go a long way in alleviating poverty particularly among the teeming populace.

REFERENCES

Ahmed K. (1998). The Kano physical environment. Retrieved from <http://www.Kanostate.net/physical.html>

- Ajala M. K. (2004). Household decision-making in the production of small ruminants in Giwa Local Government Area of Kaduna State of Nigeria. In: Proceedings of the 29th Annual Conference of the Nigerian Society of Animal Production. Sokoto, Nigeria. pp 399–402
- Garba Y. & Muhammad I. R. (2008). Sabara (*Guiera senegalensis*) as browse and a potential milk enhancer in ruminants in the semi-arid environment. Res. J. Anim. Sci. 2(4):123-127.
- Jabbar M. A. (1993). Evolving crop-livestock farming systems in the humid zone of West Africa: Potential and research needs. Outlook on Agriculture 22(1):13-21.
- Kano State Economic Empowerment and Development Strategy, K-SEEDS, (2004). Kano State Economic Empowerment and Development Strategy (K-Seeds) Policy Framework. Retrieved from http://web.ng.undp.org/documents/SEEDS/Kano_State.pdf.
- Momoh O. M. & Ochaba A. O. (2002). Herd structure of smallholder goat production in Otukpo LGA of Benue State, Nigeria. Trop. J. Anim. Sci. 5(2):53-57.
- Muhammad I. R., Ashiru R. & Abdullahi A. Y. (2007). Implications of the slaughter of pregnant ewes and does to future stock in the semi-arid urban abattoir. J. Anim. Veter. Adv. 6(6):819-822.
- Njoku P. C. (2005). Development of quality assurance in Nigeria livestock industry. A paper presented at the 10th Annual Conference Animal Science Association of Nigeria, Ado Ekiti 12-14.
- Olaloku E. A. (1999). Sustainable animal production for self-sufficiency in the 21st century. In: Animal Science at the University of Ibadan: The way forward. 25th Anniversary Commemorate Brochure. De-Ayo pub. Ibadan. pp 29-44.
- Otchere E. O., Ahmed H. U., Adenowo T. K., Kallah M. S., Bawa E. L. K., Olorunju S. A. & Voh A. A. Jr. (1987). Sheep and goat production in the traditional Fulani agro-pastoral sector of Northern Nigeria World Anim. Rev. 64:50-55.
- Shaib B. A., Aliyu A. & Bakshi J. B. (1997). Nigeria national agricultural research strategic plan 1996-2010. Department of Agricultural Sciences, Federal Ministry of Agriculture and Natural Resources, Abuja.
- Sodiya C. I., Omotayo A. M., Apantaku S. O. & Adedire M. O. (2008). Socio-economic impact of some identified components of the agro pastoral production system in Ogun State, Nigeria. In: Adeyemi O. A., Ogungbesan A. M., Dada A. O. Animal agriculture towards millennium development in Nigeria. Proceedings of 33rd Annual Conference of Nigerian Society for Animal Production held at the College of Agricultural Sciences. Olabisi Onabanjo University, Ogun State, Nigeria. 312-315
- Statistical Package For Social Sciences, SPSS, (2007). Statistical package for social sciences version 16.0 for Windows.
- Wilson R. T. (1988). Small ruminant production systems in tropical Africa. Small Ruminant Res. 1:305-325.
- Yisehak K. (2008). Gender responsibility in smallholder mixed crop–livestock production systems of Jimma Zone, South West Ethiopia. Livestock Res. Rural Dev. 20:11. Retrieved October 23, 2015, from <http://www.Irrd.org/Irrd20/1/yise20011.htm>.