

SOCIOECONOMIC CHARACTERISTICS AND UTILIZATION OF CROP RESIDUES BY CROP-LIVESTOCK FARMERS IN (NORTHERN GUINEA SAVANNA), KADUNA STATE

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ABSTRACT

The study was conducted to examine the socio-economic characteristics of crop-livestock farmers in Kaduna State. A detailed structured questionnaire was administered, data collected were demographic, small ruminants production, availability and utilization of crop residue in the study area. The result reveals that majority (86.5%) of the respondents were male with most of them are within the age of 31 years - 40 years (56.5%). Small ruminants management system were mainly extensive system (71%) with (76.5%) of their source of stock is purchase. Utilization of crop residue (73.5%) lack of knowhow on how to improve the quality of crop residue while (100%) of the respondents were not aware of crop residue silage making. The farm ownership characteristics were (71%) inheritance and farm size 1-2 Ha (71.5%). Production constraints in the study area were identified as feed cost and its shortage (24.5%) whereas the respondents perceived need to alleviate the constraint was subsidy on feed (56%). It is therefore concluded that they were mainly smallholder farmers and government support in creating awareness is needed on the use and upgrading of crop residue thereby alleviating the constraints in crop – livestock production.

KEYWORDS: *crop residue, Small ruminants, crop-livestock farmers.*

INTRODUCTION

Background Information

Crop and livestock agriculture is important to the lives of most Nigerians (Akinola *et al.*, 2015) in which the detrimental effect of long dry season in semi arid region on the quantity and quality of feed availability to the livestock is well documented (Ashiru, 2014). Therefore, to improve livestock productivity in Nigeria sustainable solutions to seasonal deficiencies in feed availability and quality are required (Usman *et al.*, 2010). In the tropics feed resources for livestock are mainly from rangeland complemented with crop residue. Crop residues which are post-harvest materials or roughages left after the removal of the primary feed (grain) from crop plants constitute an important feed for ruminants during the long dry season. In Nigeria cereal residues such as sorghum, maize, millet stovers and rice straw are the most important feed for ruminants. The need to use crop residues to complement the dry season feed shortages has predicated on the fact that conventional feed has become expensive due to their competitive use by man and industry. Amongst the cereal crop residues, maize stover is the most abundant and has the greatest potential as a basal feedstuff for small ruminants in the savannah. However, the major limiting factor in the utilization of these crop residues is its cellulosic fibers and poor protein contents consequently low digestibility and relatively poor nutrient composition (Al-madhidi and Al-khatib, 2010). Most of these types of agricultural residues are not useful to man and thus constitute a nuisance to the environment (Belew and Babalola, 2009). Residues that constitute health and environmental problems because of their disposal. The dumps serve as breeding sites for pests while burning produces ozone-depleting gases. Northern Guinea Savanna is known for cereal crop production and the resulting crop residue could be used as a potential feed source for small ruminants. The major cereal crop residues in the northern Guinea savanna zone of Nigeria are maize, sorghum stovers, rice straws and chaffs. In Nigeria, very little percentage of the abundant crop residue generated by agro-industrial establishments as waste is recycled, used as composting material or as animal feed supplement because of its low protein and high crude fibre contents. Therefore, objectives of this study were to determine the socioeconomic status and the Non Protein Nitrogen and Soybean meal utilization by crop livestock farmers in Kaduna State.

MATERIALS AND METHODS

Study Area

The study was conducted in two ADP zones; (Lere and Birnin Gwari) Kaduna State. The State is located in the Northern Guinea Savanna ecological zone and occupies an area of about 48,473.2 square kilometers with a population of over 6 million (NPC, 2006). The geographical location of the study area lies between latitudes 11°32' and 09°02' N and longitudes 08°50' and 06°15' E. The State has a suitable climate and environmental conditions favourable for cereal crop production and is becoming notable especially for maize production (Ammani *et al.*, 2012).

Survey Design and Sampling procedure

A multistage sampling procedure was employed to study the socioeconomic characteristics farmers in the study area. A multistage sampling was employed (200) crop-livestock farmers. In the first stage: Two agricultural Development Project (ADPs) Zones out of four ADPs in the State. In the second stage: Five (5) farming communities based on their participation in crop-livestock production. Lastly, Twenty (20) crop-livestock farmers were randomly selected from farming communities as respondents, making a total of (200) crop-livestock farmers. The five communities from Lere zone are Danalhaji, Saminaka, Yarkasuwa, Lere and Raminkura while those in Birnin Gwari are Dawakin Basa, Randagi, Kazage, Kuyello in Birnin Gwari zone, Kaduna State.

Data collection

Data collection household interviews by trained enumerators using a pre-tested, structured questionnaire was conducted. From each household farm land characteristics (farm size, allocation, ownership type), socio-economic characteristics (age, sex, education, economic activities engaged in), livestock characteristics (number, ownership pattern, herd composition, source of foundation stock, purposes of keeping livestock, feed resources and feeding practices) and detailed information about crop residues (farmers' awareness of, perception about and motive of crop residues utilization). In addition, secondary data on agricultural production practices were collected from Kaduna State ADPs published and unpublished sources.

RESULTS

Biodata of the Respondents in the Study Area

Table 1. The result revealed that Male farmers constituted 86.5% and female 13.5%, also 86% of the respondents were married followed 10.5% were single while divorce had the least of 1.5%. The purposive selection of farmers make it (100%) of the respondents were crop livestock farmers with (58%) involved in trading, (36.5%) were in other forms of occupation with the least (5.5%) were civil servant. All respondents had formal or informal form of education with (32%) of the farmers had Qur'anic while (21%), (19.5%) and (16.5%) had tertiary, primary and secondary education respectively, whereas adult education had the least (10.5%). The age of the respondent range from 20 years to above 51 years, with majority of the respondent fall within 31-40 years (56%) followed by 41-50 years, 51 and above years had (24.%) and (13.5%) while 20-30 years had the least (5.5%). Their experiences in years range from 1 – above 16 years, 6-10 years' experience is higher (45.5%) followed by 1-5 years (23%) and the lowest was (12%) in 16 years and above. Household size of the respondents were 6-10 person (55.5%) followed by 1-5 (40%) and the least was 11 years and above.

Management and livestock species owned by the respondents.

The result revealed that (Table 2.) the respondents are predominantly crop - livestock system. They cultivate crop as well as kept either sheep or goats with the majority of the respondents kept in combination of sheep and goat (58%), followed by (26.5%) had sheep and the lowest (15.5%) were those that had goat. Flock size ranges from 1- 16 and above (63%) of the respondent had 6-10, followed by (25.5%), (7%) and (4.5%) had 11-15, 1-5 and 16 and above respectively. The sources of stock by the respondents were purchasing (76.5%) followed by inheritance (19%) and the lowest (4.5%) in others. The management systems of small ruminants production system were extensive, semi intensive and intensive management had (71%), (18.5%) and (10.5%) respectively, reason for the choice of these methods were cheaper (40.85%) followed by tradition (35.92%) and the least were (23.24%) is the conveniences of the method. In semi intensive management system the reasons for the choice of management were cheaper (51.35%), (37.84%) and (10.81%) is convenience and security respectively. Whereas in intensive choice of management are security (71.43%) and convenience (28.57%). While in extensive management system reasons for the choice were (40.85%), (35.92%) and (23.21%) for cheaper, tradition and convenience respectively.

Farm Ownership and Size

Table 3: Presented mode of acquiring farm ownership and size the farm ownership by the respondents in the study area reveals that inheritance had (71%) followed by purchase of farm land (17%), others had (7.5%) and lowest were those that lease the farms (4.5%). The farm size range from less than one hectare to five hectares and above, 1-2 hectares (71.5%) followed by 3-4 hectares (18.5%), 5 hectares and above (7%) while less than one hectare had the least. The result further revealed that perception of respondents on the importance and utilization of crop residue (73.5%) stated that lack of technical know-how as constraint on the treating crop residue while (20.5%) stated that treating straw is not important and other forms of utilization (6%) had the least. Conversely awareness on the utilization of non-protein nitrogen sources (Urea, Poultry litter and Soybean Meal) had (100%) of the respondents were not aware. Furthermore, the utilization of maize cob in the study area were 3.5% < 11.5% < 85% as animal feed, fire wood and not use at all (left on the processing site) respectively

DISCUSSION

The knowledge of utilization of crop residue in livestock production increased with increase in age of the respondents 31 to 50 years and declined thereafter, which was in agreement with reports by (Muhammad *et al.*, 2007). Also, the report by Ajala *et al.*, (2008) indicated that age groups of 36 to 59 year are the majority of the stock owners in small ruminant production in Northern guinea savanna of Nigeria. Consequently, this age range group would perhaps be more receptive to new technology and innovation that will not result in techno-rejection.

Occupation of the respondents in the study area was diverse with all the respondents being crop-livestock farmers as a result of the purposive selection of farmer for the study. This diverse occupation agree with findings of Ajala *et al.*, (2008), Muhammad *et al.*, (2007), Otchere *et al.*, (1987), Garba *et al.*, (2015) and Hassan *et al.*, (2015). Other occupations engaged by the respondents were in harmony with Garba *et al.*, (2015) that reported traders, civil servant and students were in livestock rearing. Furthermore, small ruminants production is an occupation that could be practice by all as it requires little expertise and skill interm of husbandary practice Garba *et al.*, (2015). The respondents involved in the present study had one form of education or the other: western (constituting Adult, Primary, Secondary, and Tertiary education) or eastern (Qur'an education). This finding agree with (Ahmed *et al.*, 2014). However, it contrasts the report by Ajala (2008) that stock owners in peri urban small ruminant's production are predominantly illiterates. Fortunately, literacy is a function of education which is an important factor in knowledge and skill acquisition. That would enhance transfer of and adoption of new technology in improving the quality of fibrous crop residue there by enhancing intake and digestibility reducing the cost of production.

Table 1. Biodata of the Respondents in the Study Area

Variables	Frequency	Percentage
Gender		
Male	173	86.5
Female	27	13.5
Marital Status		
Single	21	10.5
Married	172	86
Widowed	4	2
Divorce	3	1.5
Occupation		
Crop-Livestock	200	100
Trading	116	58
Civil Service	73	36.5
Other	11	5.5
Level of Education		
Quran	65	32.5
Adult	21	10.5
Primary	39	19.5
Secondary	42	21
Tertiary	33	16.5
Age (Years)		
20- 30	11	5.5
31 – 40	113	56.5
41 – 50	49	24.5
51 - and above	27	13.5
Experience (Years)		
1 to 5	47	23.5
6 to 10	91	45.5
11 to 15	38	19
16 and above	24	12
Household Size		
1-5	80	40
6-10	111	55.5
11 and above	9	4.5

Source : Field Survey, 2017

Table 2. Management of Small ruminants by crop livestock farmers in the study area

Variables	Frequency	Percentage
Species of Livestock		
Sheep	53	26.5
Goat	31	15.5
Sheep and Goat	116	58
Flock Size		
1 to 5	14	7
6 to 10	126	63
11 to 15	51	25.5
16 and above	9	4.5
Reason for keeping Small Ruminants		
Market/sale	57	28.5
Prolific	60	30
Festivity	33	16.5
Ease of keeping	39	19.5
Other	11	5.5
Sources of Stock		
Inheritance	38	19
Purchase	153	76.5
Others	9	4.5
Management System		
Intensive	21	10.5
Semi-Intensive	37	18.5
Extensive	142	71
Reasons		
Intensive		
Security	15	71.43
Convenience	6	28.57
Semi-Intensive		
Convenience	14	37.84
Security	4	10.81
Cheaper	19	51.35
Extensive		
Tradition	51	35.92
Cheaper	58	40.85
Convenience	33	23.24

Source : Field Survey, 2017

Table 3. Farms Ownership, Farm Size and Utilisation of Maize cob in the Study Area

Farm Ownership	B/Gwari	Lere	Total	Percentage
Purchase	8	26	34	17
Inheritance	84	58	142	71
Lease	2	7	9	4.5
Others	6	7	15	7.5
Farm Size (Ha)				
1>	2	4	6	3
1-2	16	21	143	71.5
3-4	73	70	37	18.5
5 and above	9	5	14	7
Farmers Reasons For Not Treating Residue				
Treating straw is not important			41	20.5
Lack of knowledge on how to do it			147	73.5
Others			12	6
Awareness on Ensilage Usage of NPN				
Aware			0	0
Not aware			200	100
Utilization of Maize Cob				
Animal Feed			7	3.5
Fire wood			23	11.5
Not use			170	85

Source : Field Survey, 2017

CONCLUSION AND RECOMMENDATION

The study revealed that ruminant livestock in study area are critically faced by the shortage of dry season feed resources. This is mainly manifested in both the quantity and quality of the herbaceous forage resources available during that period of the year. It's concluded that high cost/shortage of feed, diseases and inadequate veterinary services were among the constraints in livestock production in the study area. All respondents were not aware of the use of non-protein nitrogen (Field survey 2017) . It is recommended that there is need to creating awareness on use of the crop residue for sustainability and environmental conservation

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