Estimation of availability and distribution of browse species and number of small ruminant animals among farmers in selected communities of Nsukka Area of Enugu State.

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Abstract

A study of browse plants in Nsukka rural communities was conducted between February and March 2005. Structured questionnaires were administered to farmers in four communities in Nsukka Local Government Area. Twenty (20) browse species belonging to 14 families were identified. All the sampled respondents kept sheep and/or goats and depend on the natural pasture as the main source of browse plants for the animals. Fifty five per cent (55.0%) of the farmers sampled practised stall feeding while 45.0% of the respondents left the farm animals to roam and graze, especially during the dry season after crop harvests. The mean stock number per farmer in this study was 4.9 for goats and 1.0 for sheep with the highest numbers being in the Eha-Alumona community. In Obukpa community, sheep did not feature significantly. Species in the families of Bignoniaceae, Chrysobalanaceae, Fabaceae, and Moraceae, are common in all the communities. The family of Moraceae has the largest number of commonly utilized browse plants.

Keywords: Browse species, stock number, distribution and availability of browse

Introduction

Small ruminants (i.e. goats and sheep) occupy an important position in the farming system of south-eastern Nigeria because of their adaptation to the prevailing conditions of weather and available range of grasses and browse plants (Mecha and Adegbola, 1980). The lack of animal feed stuff (i.e. browse plants) has never-the-less been recognized as a constraint in the production of ruminant animals within the traditional agro-forestry systems of south-eastern Nigeria (Okeke, 1996). The supply and quality of herbage for livestock during the dry months of the year declines substantially (Oloyo and Iielaboye, 2002). Urbanization, industrialization, increasing population and high population density have led to fast disappearance of the forest and forest

genetic resources and also to shortened fallows within the region. These factors are presently threatening continued small ruminant production in south-eastern Nigeria including Nsukka in the derived savanna zone of Nigeria (Okeke, 1996). At present, browse species are collected from the wild within the Nsukka rural areas. There seems a need to focus some research attention on the distribution and utilization of identified browse plants of rural communities in Nsukka Local Government Area of Enugu state to aid inventorisation.

In spite of the increasing importance of these browse plants, there is paucity of research and information on browse species within Nsukka rural communities of Enugu state. Accordingly, the research was undertaken within the area to:

1. Identify the browse species in use in the traditional animal rearing systems in Nsukka rural communities.
2. determine the ease of availability and distribution of identified browse species in the area.
3. estimate animal numbers among farmers in the communities.

Materials and Methods

Semi structured interview schedule and field visits were carried out between February and March 2005 in four communities within Nsukka Local Government Area (LGA) of Enugu state. The communities selected were Eha-alumona, Edemani, Obukpa and Obimo communities in the east, west, north and south of Nsukka LGA, respectively. Nsukka is situated in the derived savannah ecological zone on latitude 06° 52' N, longitude 07° 24' E and with an altitude of 447.26 meters above sea level. There were five farmers in each community and a total of 20 farmers from the four communities were interviewed.

The information required in the interview schedule included:

1. Age, sex and name of respondent (personal data of respondent).
2. Number of sheep and goats per farmer.
3. Inventory and utilization of browse plants in the community
4. Availability rating of species was based on mean scores to the nearest whole number (Key: 1 = scarce; 2 = moderately available; and 3 = easily available)

The species and their families were identified with the help of a taxonomist in the Department of Botany University of Nigeria, Nsukka. The local names were provided by the local farmers. The results of the interview were analyzed using

percentages and arithmetic means as described by Steel and Torrie (1980).

Results

Twelve farmers representing seventy per cent (70.0%) of the respondents were between 51 and 80 years old and are therefore, sufficiently experienced to give reliable data (Table 1). All the respondents kept sheep and goats and depend on the natural pasture as the main source of feed for their livestock. Nine farmers representing fifty five per cent (55.0%) of the respondents practiced stall feeding while eight farmers representing forty five per cent (45.0%) of the respondents practised extensive grazing system.

The highest mean stock number per farmer of 7.6 was recorded in the Eha-alumona community (Table 2). The mean stock per farmer ranged from 1 to 20 over the study areas. In the Obukpa community, none of the respondents reared sheep.

Twenty (20) browse plants belonging to 14 families were identified in the 4 communities (Table 3). Some species in the families of *Bignoniaceae*, *Chrysobalanaceae*, *Fabaceae*, and *Moraceae*, are common in all the communities. The family of *Moraceae* has the largest number of commonly utilized browse plants. Table 3 further shows that the most frequently used browse plants (with mean usage $\geq 15\%$) across all the sampled communities include: *Ficus thonningii* (21.25), *Persea americana* (16.25) and *Pterocarpus santalinoides* (15.0).

Species within *Bombacaceae*, *Icacinaceae*, *Lecythidaceae*, *Meliaceae*, *Rubiaceae*, *Tiliaceae*, and *Verbenaceae* are not common in Eha-Alumona community (Table 4). Also species within *Mimosaceae*, *Tiliaceae* and *Rubiaceae*

Table 1: Age, gender, number of children, grazing system and type of pasture used in Nsukka rural areas

Age bracket	< 20 years	21 – 50 years	51 – 80 years	> 80years	
% of respondents	0	25	70	5	
Gender	Male	Female			
% of respondents	85	15			
Number of children	Non	1-4	5-10	>10	
% of respondents	0	25	70	5	
Grazing System	Zero	Rotational	Extensive	Strip	Creep
% of respondents	55	0	45	0	0
Type of pasture	Natural	Sown	Pure	Mixed	
% of respondents	100	0	0	0	

are not common in Obukpa community. Similarly, species within *Meliaceae*, and *Mimosaceae* are not common in Edemani community and species within *Meliaceae*, *Tiliaceae* and *Rubiaceae* are not common in Obimo community.

Discussion

The mean animal number per farmer in this study which was 5 for goats and 5 for sheep fell below the results of Edokwe (1979) and Orok and Duguma (1987) who reported 10 goats and 9 sheep in the old Anambra state and 11 goats and 9 sheep in the old Cross River state, respectively. The reduced number of small ruminant animals/farmer in the study area has been attributed to continual reduction of the browse plants in south-eastern Nigeria, as result of increasing human population density, urbanization, industrialization and conversion of forests to arable and plantation agriculture (Okeke, 1996). Secondly, the dominant stall feeding or the cut and carry system of small ruminant production

in the study area is labour intensive (Devendra, 1987). With the present economic recession in Nigeria, most farmers probably divert their attention to other agricultural activities that yield quick financial returns, thus a reduction in livestock holding.

Twenty browse species were identified in Nsukka rural communities of Enugu state compared to 23 browse species in old cross River state (Orok and Duguma, 1987) and 29 browse species in the south-eastern Nigeria (Mecha and Adegbola, 1980). This study provides livestock managers, and feed production experts in the area an in depth information on browse plants in the area. Okeke (1996) noted that the presence or distribution of browse species vary with villages, cropping area or bush fallows. Thus, human disturbance generally leads to vegetation types under otherwise similar conditions. Within the derived savanna zones in south-eastern Nigeria, the removal or opening up of woodlands, is a

Availability of browse plants in Nsukka communities

Table 2: Summary of number of Goat and Sheep held by farmers in communities in Nsukka Local Government Area.

Community Sampled	Number of farmers sampled per community					Mean
	1	2	3	4	5	
GOAT						
Obukpa	6.0	15.0	6.0	2.0	5.0	6.8
Obimo	3.0	3.0	5.0	1.0	2.0	2.8
Eha- alumona	3.0	3.0	10.0	-	10.0	5.2
Edemani	1.0	6.0	6.0	4.0	7.0	4.8
Mean	3.3	6.8	6.8	1.8	6.0	4.9
SHEEP						
Obukpa	-	-	-	-	-	-
Obimo	-	4.0	-	-	-	0.8
Eha- Alumona	-	-	-	2.0	10.0	2.4
Edemani	-	3.0	-	-	-	0.6
Mean	-	1.8	-	0.5	2.5	1.0
GOAT + SHEEP						
Obukpa	6.0	15.0	6.0	2.0	5.0	6.8
Obimo	3.0	7.0	5.0	1.0	2.0	3.6
Eha- Alumona	3.0	3.0	10.0	2.0	20.0	7.6
Edemani	1.0	9.0	6.0	4.0	7.0	5.4
Mean	3.3	8.5	6.8	2.3	8.5	5.9
GOAT: SHEEP RATIO						
Obukpa	-	-	-	-	-	-
Obimo	-	1:1.3	-	-	-	3.5:1
Eha- alumona	-	-	-	-	1:1	2.2:1
Edemani	-	2.0:1	-	-	-	8.0:1
Mean	-	3.8:1	-	3.6:1	2.4:1	4.9:1

- signifies nil

Table 3: Distribution of browse plants in four communities and species usage (% of respondents) in Nsukka Local Government area.

Distribution and usage (%age respondent) of forage plants in Nsukka L.G.A.						
S/ No	Family and species	Obukpa	Obimo	Eha- Alusona	Edemani	Mean
1	Bignoniaceae <i>Neboulia leavis</i>	10.0	20.0	5.0	5.0	10.0
2	Bombacaceae <i>Ceiba pentandra</i>	-	5.0	-	-	1.25
3	Caesalpiniaceae <i>Dialium guineense</i>	5.0	-	5.0	10.0	5.0
4	<i>Berlinia grandiflora</i>	-	5.0	-	-	1.25
5	Chrysobalanaceae <i>Acioa bateri</i>	15.0	5.0	5.0	20.0	11.25
6	Fabaceae <i>Pterocarpus santaliniodes</i>	-	25.0	15.0	20.0	15.00
7	<i>Baphia nitida</i>	5.0	20.0	5.0	5.0	8.75
8	Icacinaceae <i>icacina trichantha</i>	-	-	-	5.0	1.25
9	<i>Irvingia gabonensis</i>	5.0	5.0	-	-	2.50
10	Lauraceae <i>Persea americana</i>	20.0	-	25.0	20.0	16.25
11	Lecythidaceae <i>Napoleona imperialis</i>	5.0	5.0	-	15.0	6.25
12	Meliaceae <i>Azadirachta indica</i>	5.0	-	-	-	1.25
13	Mimosaceae <i>Pentachlethra macropylla</i>	-	5.0	10.0	-	3.75
14	Moraceae <i>Ficus thonningii</i>	20.0	25.0	20.0	20.0	21.25
15	<i>Treculia africana</i>	5.0	10.0	10.0	10.0	8.75
16	<i>Milicia excelsa</i>	-	-	15.0	-	3.75
17	Sterculiaceae <i>Triplochiton scleroxylon</i>	-	5.0	-	-	1.25
18	Tiliaceae <i>Glyphaea brevis</i>	-	-	-	25.0	6.25
19	Verbenaceae <i>Gmelina arborea</i>	5.0	-	-	5.0	2.50
20	<i>Vitex doniana</i>	-	10.0	-	-	2.50

- signifies nil

Availability of browse plants in Nsukka communities

Table 4: Availability and distribution of browse plants in the sampled communities of Nsukka (availability rating is based on mean scores to the nearest whole numbers; figures also indicate distribution areas). Key: 1 = Scarce; 2= moderately available; 3= easily available.

S/No	Family and species	Obukpa	Obimo	Eha-Alumona	Edema ni	Mean
	Bignoniaceae					
1	<i>Newbouldia leavis</i>	3	3	2	3	3
	Bombacaceae					
2	<i>Ceiba pentandra</i>	-	2	-	-	1
	Caesalpinoideae					
3	<i>Dialium guineense</i>	2	-	3	2	2
4	<i>Berlinia grandiflora</i>	-	2	-	-	1
	Chrysobalanaceae					
5	<i>Acioa bateri</i>	2	3	3	3	3
	Fabaceae					
6	<i>Pterocarpus santaliniodes</i>	-	2	2	2	2
7	<i>Baphia nitida</i>	3	3	2	3	3
	Icacinaceae					
8	<i>Ikacina trichantha</i>	-	-	-	1	0
9	<i>Irvingia gabonensis</i>	3	2	-	-	1
	Lauraceae					
10	<i>Persea americana</i>	3	-	2	3	2
	Lecythidaceae					
11	<i>Napoleona imperialis</i>	2	3	-	3	2
	Meliaceae					
12	<i>Azadirachta indica</i>	3	-	-	-	1
	Mimosaceae					
13	<i>Pentachlethra macrophylla</i>	-	3	2	-	1
	Moraceae					
14	<i>Ficus thonningii</i>	3	3	2	3	3
15	<i>Treculia africana</i>	3	2	2	2	2
16	<i>Milicia excelsa</i>	-	-	1	-	0
	Sterculiaceae					
17	<i>Triplochiton scleroxylon</i>	-	2	-	-	1
	Tiliaceae					
18	<i>Glyphaea brevis</i>	-	-	-	3	1
	Verbenaceae					
19	<i>Gmelina arborea</i>	3	-	-	1	1
20	<i>Vitex doniana</i>	-	2	-	-	1

- signifies nil

major determinant of the amount of vegetation and the species composition (Okeke, 1996) in the communities used for this study.

Conclusion

Twenty browse species belonging to 14 families were identified. All the sampled respondents kept small ruminants and have the natural vegetation as their main source of forage for the animals. Fifty five per cent (55.0%) of the farmers sampled practiced zero grazing while 45.0% of the respondents practiced extensive grazing system. The mean stock number was 4.9 goats and 1.0 sheep per farmer. Browse plants are not easily available throughout the area. There is the need for proper documentation, utilization, management and conservation of identified browse species in these communities to meet the nutritional needs of small ruminant especially, during the dry season period when productivity of natural grassland is very low.

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