

ASSESSMENT OF FORAGE COMPOSITION IN UDUBO GRAZING RESERVE, BAUCHI STATE.

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ABSTRACT

The study was conducted in Udubo Grazing Reserve between July 2019 and October, 2019 to assess forage utilization for pasture-based livestock production in the reserve. The grazing land was cross-divided into grids, where 15 coordinates were selected as the sample points. Grids of one-kilometer interval were made. The grids were systematically selected 1 grid after 7 grids. 1 × 1-meter quadrat was made at the coordinate of the selected grids for measurement, estimation and sample collection. The results of the study indicated that, *Zornia glochidiata* as highest percent of species composition (42%) while *Mitracarpus hirtus* has the lowest percent (0.1%). *Zornia glochidiata* has 60 percent of height removed and 57 percent used by weight as highest percent utilization. The target is 50 percent utilization of forage by weight during a grazing period as well as at the end of the grazing season. The study found that *Orochloa mosambicensis*, *Alysicarpus vaginalis* and *Cenchrus biflorus* had lower percent by weight which is normal, while *Zornia glochidiata* had higher percent by weight which is an indication of danger. The study recommends that Identification of key plant species in pasture and rangeland is critical to implementing a successful grazing management plan. There should be collective action and promotion of historically generated grazing knowledge through public and private advocacies.

Key Words: Forage, Pasture, Grazing Reserve, Plant Species, Live Stock.

INTRODUCTION

Livestock production in the developing world occurs in a wide range of heterogeneous production systems (Herrero, et al., Thornton, Gerber and Reid 2010). These range from pastoral/grassland-based systems, which occupy most of the land area that have low human population densities, through mixed crop-livestock systems, usually in areas suitable both for arable and livestock production and where the bulk of rural human population lives, and intensive systems usually in peri-urban/urban areas (Herrero, *et al* 2010).. Landless systems are also often found in urban areas.

Fodder crops (including cereals and pulses) are a major component of today's agriculture (Kallah 2004). The other components are livestock and fisheries. Forage and fodder crops are very central in the development of Nigeria's livestock industry. The bulk of the animal protein, especially milk and meat, consumed in Nigeria are derived from ruminant animals, which are dependent mainly on these crops.

Ismail (2013) noted that formal grazing reserves in Nigeria started accidentally in the 1950s when Hamisu Kano, working with pastoralists on livestock vaccination, foresaw the shortages of grazing land in Northern Nigeria. Supported by the government, he initiated the grazing reserve scheme from the abandoned government resettlement schemes (Fulani Settlement Scheme).

MATERIALS AND METHOD

Study Area

Udubo grazing reserve lies between Latitude 11° 52' and 11° 58' North of the Equator and Longitude 10°30' and 10° 44' east of the Green which Meridian and is located in Gamawa local government area occupying a total land area of 111 km² and covers 11,100 hectares of land (Bauchi sState of Nigeria Gazette No:6 1986)(Figure 1).

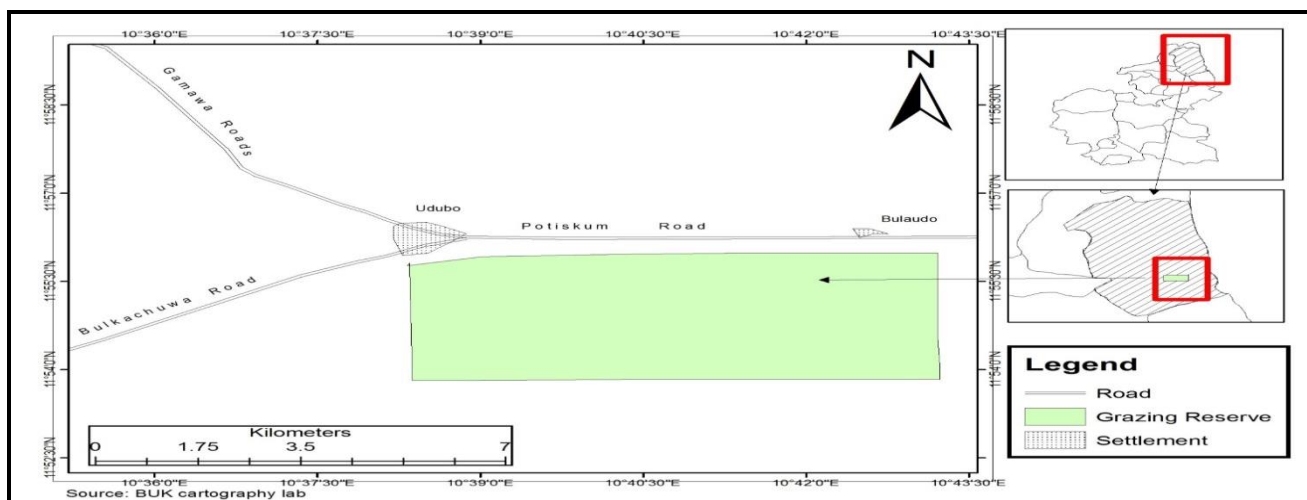


Figure 1: Map of Udubo Grazing Reserve.

Method of Data Collection

The research design used for this study is quasi-experimental design. It includes variable that can be manipulated by the researcher, and variables that can be measured, calculated and compared. The grazing land was cross-divided into grids to select the sample points. At the end of each point, a quadrat was established for estimation, measurement and sample collection. The grazing land was divided into regular grids of one-kilometer interval. And the grids were systematically selected 1 grid after 7 grids. A 1 × 1 meter quadrat was made at the coordinate of the selected grids, and thus formed sample quadrat for measurement, estimation and sample collection. Primary data were obtained from the field which includes data on species composition of pasture, and forage type. It also involves collecting information from local land users (pastoralist) for the inventory of the identify forage for quantitative estimation. Secondary data includes satellite images, herbarium as well as books on botanical names of forages.

Methods of Data Analysis

Descriptive statistics is the analytical techniques used to achieve the objectives of the study and the result on variables investigated upon which is presented based on the DAFOR scale. This is a practical quadrat method for identifying species composition in pasture field whereby quadrat was employed at 15 coordinates in the study area (Plate 1). Each quadrat, individual species density was counted and recorded in (Table1). DAFOR Scale was used to rate each species for it abundance based on DAFOR Scale definitions as adopted by Brodie, (1985).

Whereas:

D = Dominant (Species covers most or all > 3/4 in the study area), A = Abundant (Species cover 1/2 or 3/4)

F = Frequent (Species well scattered but covers < 1/2 of the area), O = Occasion (Species occur a few times), R = Rare (Species present only once or twice)

The scale definitions were categorized as (> 20 % = dominant, 15 – 19 % = abundant, 10 – 14 % = frequent, 5 – 9 % = occasion, 0 – 4 % = rare).

RESULT AND DISCUSSION

Species Composition

This section discussed the result of quadrat method for identifying species composition in Udubo grazing reserve pasture field (Plate 1). The species composition of the area was found in terms of density composition as summarized in (Table 1)

The findings revealed that *Zornia glochidiata* (legume) has the highest percent density of (42%) while *Mitracarpus hirtus* (grass) has (0.1%), has the lowest percent density. Which indicate it as “dominant” and “rare” base on the rate of DAFOR definition in the pasture field. This conforms to the findings of Krishona *et. al*, (2017). *Urochloa mosambicensis* (grass) has (15%), *Sida cordifolia* (grass) has (14%). *Eragrostic tremula* (grass) has (5%), *Alysicarpus vaginalis* (legumes) has (0.5%), *Striga hermonthea* (legume) has (0.2%), *Cynodon plectostachyus* (grass) has (8%), *Digitaria debilis* (grass) has (0.4%),

Kyllinga spp (grass) has (0.6%), *Casia tora* (legume) has (0.3%) and *Ctenium elegans* (grass) has (14%) among others.



Plate 1: Identification of species composition

Table 1: Species Composition of Pasture in Udubo Grazing Reserve

A = *Zornia glochidiata*, B = *Urochloamosambicensis*, C = *Sidacordifolia*, D = *Eragrostistremula*, E = *Alysicarpusveginalis*, F = *Striga hermonthea*, G =

PLANT SPECIES	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	Total individual density in a quadrat	number of species in a quadrat	% Composition= number of spp / total number individual × 100
Species A	110	113	100	16	22	×	100	80	79	110	105	326	122	287	231	1771		1771 / 4253 × 100 = 42%
Species B	37	40	27	69	112	41	68	60	21	44	×	13	17	73	24	646		646 / 4253 × 100 = 15 %
Species C	24	×	10	63	15	169	11	×	7	46	9	×	55	122	78	609		609 / 4253 × 100 = 14 %
Species D	6	21	2	1	×	×	3	31	×	×	60	×	7	×	87	218		218 / 4253 × 100 = 5 %
Species E	×	×	×	5	1	4	×	×	×	×	×	×	×	9	1	20		20 / 4253 × 100 = 0.5 %
Species F	×	×	×	×	×	×	×	×	×	×	×	×	4	4	×	8		08 / 4253 × 100 = 0.2 %
Species G	5	23	2	×	45	×	×	2	56	20	45	×	64	10	50	322		322 / 4253 × 100 = 8 %
Species H	×	×	×	×	×	7	×	×	×	1	×	×	8	×	1	17		17 / 4253 × 100 = 0.4 %
Species I	×	×	3	×	×	×	×	×	×	×	×	×	×	×	2	5		05 / 4253 × 100 = 0.1 %
Species J	×	×	×	×	×	×	×	×	×	×	×	×	×	×	26	26		26 / 4253 × 100 = 0.6 %
Species K	×	1	×	×	×	×	×	×	1	1	4	1	×	1	4	13		13 / 4253 × 100 = 0.3 %
Species L	13	111	15	×	×	×	14	62	×	57	96	138	92	×	×	598		598 / 4253 × 100 = 14 %
TOTAL																4253		100%

Cynodonplectostachyus, H = *Digitaria debilis*, I = *Mitracarpushirtus*, J = *Kyllingaerecta*, K = *Casiatora*,

L = *Ctennumelegan*

CONCLUSION

The findings revealed that *Zornia glochidiata* (legume) has the highest percent density of (42%) while *Mitracarpus hirtus* (grass) has (0.1%), has the lowest percent density, which indicate it as “dominant” and “rare” base on the rate of DAFOR definition in the pasture field. A constraint faced by pastoralists concerns animal feeds and water supplies which complain of inadequate pasture especially in the dry season. Even during the rainy season, many of the valued forages are no longer available on the grazing reserve and they were at the reserve in the past, but have been virtually eradicated as a result of overgrazing.

RECOMMENDATIONS

It is important to livestock officers to understand the forage resource under their control and stock livestock appropriately for a proper stocking rate.

The regulation and monitor the influx of people and their animals into the Udubo grazing reserve have largely been abandoned due to a lack of human resources, which need to be address.

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