Assessment of Effects of Encroachment of Grazing Reserves on Herdsmen Livestock in Kano State, Nigeria.

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ABSTRACT

The research was conducted with a view to assess the effect of encroachment of grazing reserves on herdsmen livestock in Kano state, Nigeria. A multi-stage sampling technique was employed in selecting herdsmen. The purposive sampling was used in selecting the respondents. One hundred and eighty herdsmen were interviewed using structured questionnaire. The results were analyzed using frequencies, percentage and Kouskal Wallis test. The results showed that majority of the herdsmen interviewed were within the age range of 40-50 years, they were all male and married with little formal education. Furthermore, the herdsmen group differed significantly in ranking the effects of encroachment of grazing reserves on livestock on 4 out of 7 effects dimensions i.e. encroachment of grazing reserves causes shortage of grasses and forages (X^2 = 32.578, P. Values = 0.000), causes low milk yield in animals (X^2 = 13.767, P. Values = 0.001), increases livestock mortality rate (X^2 = 9.797, P. Values = 0.007) and affects livestock performance (X^2 = 5. 114, P. Values = 0.078). On one hand, herdsmen did not differ in 3 out of 7 effects dimensions i.e. Encroachment of grazing reserves causes animals lose weight (X^2 = .740, P.Values = 0.691), causes animals lose market value (X^2 =.499, P. Values = 0.779) and results to weak animals (X^2 = .236, P. Values = 0.889). Thus, encroachment of grazing reserves affects each herdsman in one way or another. Therefore, the study concluded that encroachment of grazing reserves may affect the livestock negatively and has tendency to affect livestock population and productivity. Therefore, the study makes a strong request that: Government should introduce high yielding and nutritive grasses and forages and introduce vaccines, drugs and high milk yielding livestock to reduce the incidence of livestock mortality and diseases.

Key words: *Encroachment, Grazing, Grazing Reserves, Herdsmen, Livestock*

1. INTRODUCTION

Worldwide, livestock production is the principle source of food security and livelihood [1]. Study discovered that, two-third of the rural population keep livestock in developing countries [2]. Therefore, Livestock is a source of liquid assets and insurance for resource poor herdsmen in most of semi-arid sub-Saharan African Countries (SSA).

Thus, livestock production contributes to poverty reduction, nutrition, food security and sustainable rural development [3,4, & 5]. Furthermore, livestock and poultry contributes to the Gross Domestic Products (GDP) of arid and semi – arid regions of African countries for example, livestock accounts for 17% GDP in Mali, 20% in Mauritania, 18% in Niger and 15% in Burkinafaso [6].

Additionally, livestock sales as estimated contributes to over 60% of the household income in some selected pastoral communities in Kenya [7] and up to 85% of the barabaig household income in Tanzania [8]. At the household level in Nigeria, livestock directly contributes to nutritional security such as meat, milk, income earnings and source of employment [9], and indirectly to food security, the use drought power and manure to fertilize arable crop farms [10].

Livestock also plays important role in the herdsmen cultural and religious functions in Kano state as they are linked to marriage norms of paying bride price (dowry), ceremonial and festival events, sources of prestige and a key indicator of social status [11]. Livestock also provide meal of livelihood to millions of people in rural areas [12]. Despite the enormous contribution of livestock to economic growth and national development, yet the livelihood strategy (pastoralism is faced with problems of encroachment of grazing reserves as a consequence the grazing reserves are not within the reach of one – third of about three – quarter of the herdsmen [13].

Though, a wealth of research findings exists on herdsmen and their livestock, but these researchers were not comprehensive enough as they considered herdsmen as one unit, without giving recognition to their groups or category (sedentary, transhumant and nomadic herdsmen). Therefore, this study tends to assess the effect of encroachment of grazing reserves on herdsmen livestock groups or category so as to fill in the gap in knowledge. With a view to use the information in proffering solutions to usher in effective grazing reserves management.

2. LITERATURE REVIEW

Grazing reserves simply refers to a piece of land acquired, developed and released to pastoral people [14]. According to [15] grazing reserves is an area of land specially set aside to settle herdsmen and provide them with technical support. However, the grazing reserves carrying capacity estimated from stocking density decreases from arid zone to the humid in line with the patterns arid zone tom the humid in line with the pattern in rainfall and the length of growing season.

Thus, in response to grazing reserves shortages and to encourage livestock production in Nigeria, government created with grazing reserves, covering 4,288,725.6 w hectares of grazing reserves for herdsmen to hold and graze their livestock. Out of the 415 grazing reserves, only 141 were documented and gazette [16]. The backdrop of grazing reserves establishment is the pattern of land utilization in Nigeria.

On the other hand , with regard to livestock in Nigeria , most of the indigenous cattle numbering 13,900,000 [17] are made up of at least 10 largely multipurpose is reeds : White Fulani, Kuri, Sokoto Gudali, Keteku, Shuwa Arab, Muturu,Bunaji, Rahasi, Adamawa Gudali Cad Ndama [18]. Majority of these cattle as estimated, 96% are concentrated in the northern states of Nigeria i.e Borno, Bauchi, Adamawa,Kano, Zaria, and Sokoto.

Furthermore, over 90% of these herds are in the hands of transhumant and nomadic herdsmen [19]. Accordingly, these livestock are kept under variety of production systems in most part of northern Nigeria i.e. sedentary, transhumant and nomadic pastoralism). These systems account for a higher percentage of slaughter cattle. These production systems have herd growth of 1.6% to constraints notably issues with grazing reserves and pastures [20]. A combination of policy, human and natural factors act together to bring about grazing reserves shrinkage and disappearance [21,22, 23, &24,].

However, in response to dwindling grazing reserves resources, many herdsmen adopt cattle mobility, to secure ideal grazing spaces, [25]. These herdsmen on movement come across life threatening obstacles including bloodletting, clashes, tribal enemies, diseases, drought and cattle's thieves [26]. For example, in kogi state, in October 2018 alone, the commercial clashes between herdsmen and farmers, 44 killed, N541 million properties destroyed [27].

Additionally, in the outlying areas of Kano city, where the population reaches 235 per square kilometer, farmers have cultivated up to 83.5% [26], therefore livestock in this circumstances feeds on anything available and the productivity of livestock is as low as 2.25kg/ha [28]. And may likely suffer from hypoproteinanaia and subcutaneous oedema because the required 7.5% crude protein is only available to ruminant for only a third of the year [27]. Moreover, livestock in this situation according to [29], the growth rate is very slowly, taking up to 4 years reach maturity and attain slaughter weight with a low dressing a low dressing percentage as compared to these herds that are confined.

Similarly, in a research conducted by [30] on the distribution of grazing reserves in northern Nigeria found that all the reserves have been mis-used, with very many of them encroached upon by crop farmer and influential government functionaries. Very few of these reserves were developed along the proposed plan and even the existing ones were in poor condition. Based on the forging, [31] in a survey of 1,805 herdsmen in the department of marade and zinder in Niger recorded an average of 114 tropical livestock unit (TLU) per person while the overwhelming majority of herdsmen live with fewer livestock numbers than the estimated viable threshold of 3.5 TLU people.

METHODOLOGY

Study Area

The research was conducted in Kano state, Nigeria. The state lies between $10^0 33''$ N to 12 0 37'' N and longitude 70 34'' E to 90 29'' E. The total land area of Kano state is 20,760 km^2 [32], and has 44 Local Government Areas and is bordered to the south with Bauchi state, to the East Jigawa state and to the North with Katsina state. Kano state has an estimated population of 9,383,682 as at 2006 [33]. The state falls within the area described by [34] as the high plains of Hausa land. The vegetation type in the area is characterized by moderately tall grasses and scattered trees. The climate of Kano state is the tropical wet and dry type, and the mean annual rainfall is about 850mm [34]. The mean temperature according to [34] is about 26^0C but mean monthly values range between 21^0 C in the coolest months (December/ January) and 31^0C in the hottest months (April/ May).

A Description Of The Local Government Areas Of Kano State

The research was conducted in Kano state. Kano state has 3 agricultural zones: zone 1, zone 2 and zone 3. A multi – stage sampling technique was employed in selecting the respondents. In the first stage, three agricultural zones were selected for the study, two Local Government Areas were selected randomly from each agricultural zone, and they were Sumaila, Ungoggo, Kumbotso, Kiru, Rimin Godo, and Ajingi. Two communities were selected from each Local Government Area using simple random sampling to make a total of twelve communities namely Chula,Rimi, Ungoggo,Bacare, Gomo,Chalawa,Panisau, Tumawa, Gulu,Kaduna, Kyarana and Kiru. Then, convenience sampling technique was used in selecting fifteen (15) herdsmen from each community, making a total of one hundred and eighty herdsmen.
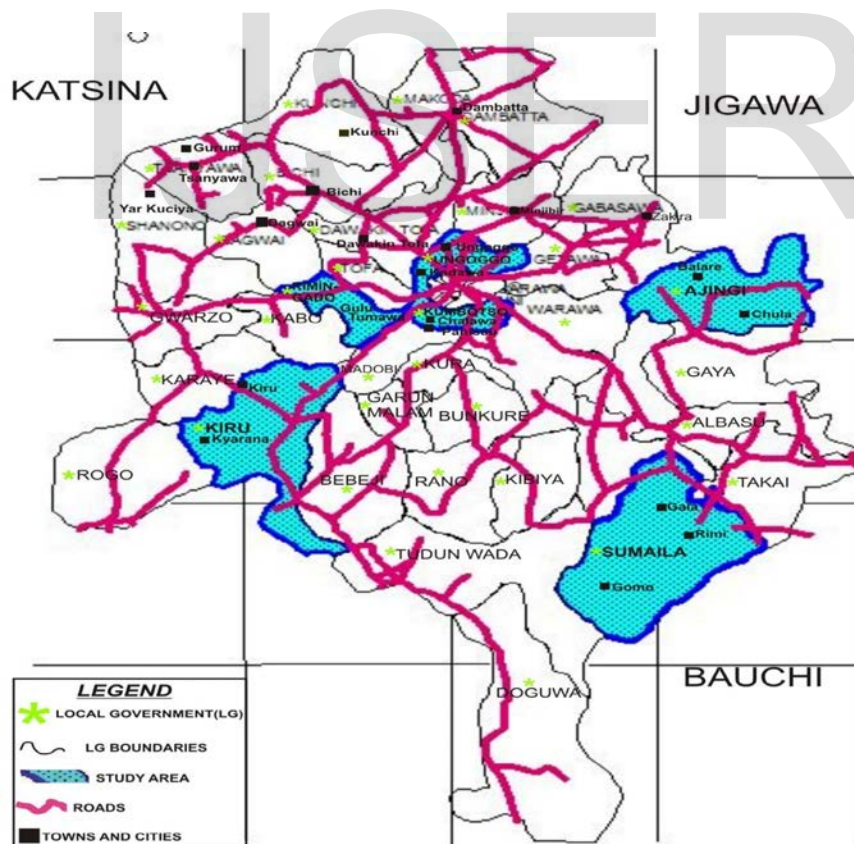

Figure 1: Map of the study Area.

Theoretical and analytical framework:

The study was guided by the tragedy of the common thesis. The theory was developed by a scholar called Garett Hardin in 1968. The basic assumptions of the theory relates to the environmental degradation and its fits into this study because of its basic assumption that self interest and economic gains can simply be combined to harm others. Central to Hardin's theory is situation he described that individuals act independently, solely and rationally in satisfying their self interest , in the end, ultimately deplete the shared scared resources even though , it is not in their interest for it to happen.

Analytical Framework

The socio-economic aspect was analysed using frequencies and percentage while the effects of encroachment of grazing reserves on herdsmen livestock was analysed using Kruskal Wallis, Non – parametric counterpart of one – way independent ANOVA [35 & 36].
 The Kruskal Wallis test in equation (1) is employed in a situation of assumptions of one – way independent ANOVA.

Model Specification

$$H = \frac{12}{N(N+1)} \; x \sum \; \frac{TC^2}{nc} \; 3\,X\,(N+1)\text{---} 1$$

Where H = Is the Kruskal Wallis test statistics.

 N = Is the total number of participating variables.

 TC^2 = Is the rank total for each category e.g. nomadic, transhumant and sedentary herdsmen.

nc = Is the number of participating variables in each category e.g. number of questions asked in each category.

Whereas 12 and -3 in the equation are constant.

The degree of freedom is similar to that of chi – square degree of freedom.

Findings

Socio-Economic Characteristics of the herdsmen

Table 1 presents the description of age, sex, education level, occupation and marital status. The results revealed that all the herdsmen interviewed were makes and narrated. This should their commitment to fulfilling both cultural and religious rights and they are considered to be reasonable enough in conducting their pastoral activities. The occupation of the interviewed herdsmen indicated that majority of them are mono – occupational. Similarly, [37] reported that major economic activities of herdsmen is cattle rearing particularly in sub-Saharan region. The age of herdsmen were found to be within the age range of 41-50 majorities. Though, [38] found a slightly different age range of 44-55 years. The education level of the interviewed herdsmen indicated that they have little formal education, the same was found by [14] and [38] in the study of pastoral Fulani literacy gap that education among pastoral people falls below national average. This shows chronic illiteracy among the interviewed herdsmen in the study area.

Table 1: Social Socio – Economic and Demographic Characteristics of Herdsmen

Characteristics	Nomadic Herdsmen		Transhumant Herdsmen		Sedentary Herdsmen	
	Frequency	%	Frequency	%	Frequency	%
Gender						
Male	67	100		100		100
Age						
<40	10	14.9	2	18.9	24	23.5

41-50	28	41.8	3	31.4	32	31.4
51 – 60	26	38.8	3	29.4	30	29.4
60 and Above	3	4.5	3	15.7	16	15.7
Educational level						
Quaranic Level	90	81.8	53	79.1	72	70.6
Primary Level	2	18.2	12	17.9	16	15.7
Secondary Level	00	00	2	3.0	12	11.8
Higher Education	00	00	00	00	2	1.9
Occupation						
Herding Alone	67	100	13	19.4	16	15.7
Herding/Farming	00	00	47	70.1	73	71.6
Herding/Labour Jobs	00	00	5	7.5	8	7.8
Herding/Civic Service	00	00	2	3.0	5	4.9
Marital Status						
Married	67	100	11	100	102	100

Source: Field survey, 2015.

Mean rank of effects of encroachment of grazing reserves on herdsmen livestock.

From table 2: the Kruskal Wallis test, herdsmen differed significantly in ranking the effects of encroachment of grazing reserves on livestock on 4 out of 7 effects dimensions. The sedentary herdsmen ranked effects of encroachment of grazing reserves causes shortage of grasses and forages for livestock (Mean rank, 106.91) as more important than how both Nomadic (Mean rank,66.68) and Transhumant (Mean rank, 83.41). The reason for sedentary ranking grasses and forages shortage is that they do not more about in search for grasses and forages as such, they feel the impact of encroachment more than Nomadic and Transhumant herdsmen. In contrast, the Nomadic and Transhumant herdsmen move about from areas of grasses shortages to areas of availability.

The results conform to the earlier finding of [40] in a study of intractable effects of drought and grazing on natural great plain range found that all the grasses on the range were totally ruined, sandblasted resulting to decrease in grass quality leaving herdsmen scavenging on anything available including inferior fodder consisting of low protein Andropogan, Bachirria and Loudetia [41]. However, [26] added that in Borno state with largest livestock numbers, there is hardly enough grasses for a year – round grazing. In the early dry season, herd in this state browse on tree leaves, branches and left-over. At the climate of dry season, livestock eat anything green including their faeces and poisonous grsses [26].

The sedentary herdsmen ranked encroachment of grazing reserves causes low milk yield (Mean rank, 98.00) and affects livestock performance (Mean rank, 96.24) as more important affects of encroachment than how both Nomadic and Transhumant ranked it. The same reason that sedentary level herdsmen are not mobile so, they rely on good of harvest. The result is in line with the finding of [39,40 & 41] in a study of environmental impact of migration in Rural Tanzania found that year – round shortage of grasses and forages lead to livestock grow slowly, weaker livestock, reduces milk yield and encourages high mortality rates.

Table 2: Mean Range of effects of Encroachment of Grazing Reserves on Herdsmen Livestock.

Effects of encroachment of grazing reserves on herdsmen livestock	Nomadic	Transhumant	Sedentary	X^2(P.Values)
	Herdsmen	Herdsmen	Herdsmen	
Encroachment of grazing reserves cause shortage of grasses and forage for livestock	66.68	83.41	106.91	32.518(0.000)

Encroachment on grazing reserves cause low milk yield in animals	78.00	94.00	98.00	13.767(0.001)
Encroachment on grazing reserves cause animals lose weight	87.90	91.91	92.06	.740(0.0691)
Encroachment in grazing reserves cause animals low market value	88.85	82.64	91.89	.499(0.779)
Encroachment on grazing reserves result to weaker animals	92.12	88.36	89.67	.236(0.889)
Encroachment on grazing reserves increases animal mortality rates	105.06	83.00	81.75	9.797(0.0007)
Encroachment on grazing reserves affects livestock performance	85.24	69.36	96.24	5.114(0.078)

Kruskal Wallis test. P.Values < 0.05, meaning significant at 95% confidence level across the rows. Numbers in parenthesis means P.Values.

Furthermore, the nomadic herdsmen ranked encroachment of grazing reserves increase livestock mortality rates (Means rank, 105.06) as the most serious effects of encroachment on livestock than both Transhumant (Mean rank,83.00) and sedentary (Mean rank ,81.75). The Nomadic herdsmen are more affected by high mortality rates because they are always on move and also walk a long journey because of thirsty, hunger, exhaustion and diseases. The result conforms to the finding of [40](Mudulu et al, 1993) in a study of drought and recovery in Turkana, Kenya which revealed high mortality rates in causes and adult cattle because of drought and diseases. Additionally, when animals walk a long distance, large herds are affected by death of calves [39] (McCabe, 1987).

Nomadic, Transhumant and Sedentary herdsmen did not differ in 3 out of 7 effect dimension, i.e. encroachment of grazing reserves causes animals lose weight (X^2=.740, P.Values = 0.691), causes animals lose market value (X^2=.499, P.Values = 0.779) and result to weaker animals (X^2 .236, P.Values = 0.889).

Encroachment of grazing reserves virtually affects each herdsmen group in one way or another. For example, Nomadic and Transhumant herdsmen engage frequently in cattle mobility which in itself is stressful particularly when it involves a long distance journey. While Sedentary herdsmen are mainly faced with feed shortage and large of grazing spaces**.**

Conclusion

The study concludes that encroachment of grazing reserves may affect the livestock negatively and has the tendency to also affect the livestock population. Thus, the study makes a strong request that: Government should introduce high yielding and nutritive grasses and forages and introduce high milk yielding livestock, vaccines and drugs to reduce the mortality rates and diseases.

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