



Research Article

Effects of nomadic herding on the environment: A case study of Kogi East senatorial district of Kogi State

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Abstract

The study examined the effects of nomadic herding on the environment in Kogi East Senatorial District of Kogi State. The craze for protein in man's diet led to his plight for the rearing practices and management of farm animals (cattle, goats and sheep). Two research questions and a hypothesis guided the study. A 21-item structured questionnaire captioned Farmers and Agricultural Extension Agent Questionnaire (FAEQ) of four point rating scale (Strongly Agree; Agree; Disagree and Strongly Disagree) was designed by researcher and used for data collection in addition to interview and personal observation. The questionnaire was administered to 232 farmers and 18 Agricultural Extension Agents by the researcher with the assistance of the trained Agricultural Extension Workers. The instrument (questionnaire items) was validated by experts in Agricultural Science Education and Measurement and Evaluation. The collected data was analysed with the use of frequency counts, Mean and Pearson Product Moment Correlation (PPMC). The results revealed that there is soil surface hard pan development; aggravation of soil erosion, breeding of pests and pollution of drinking water among others was on the increase due to nomadic herding. There was a significant relationship between the perception of farmers and that of Agricultural Extension Agents. Useful recommendations such as establishment of a ranch by the government; establishment of grazing reserve and encouragement of rotational grazing practice by the herdsman among others were proffered.

Keywords: Effects, Nomadic, Herding and Environment.

INTRODUCTION

The livestock sector is one of the mainstay of the economic activities in Nigeria with over 13 million cattle, 9 million sheep and 6 million goats, 25 – 30 million poultry (Akinola, 2009). Eighty – five percent of the cattle are found in savannah, where pastoralists rear them extensively as a source of food and livelihoods with other valuable products. Livestock production forms an important component of Nigeria's agricultural sector. As a provider of employment and income, it constitutes an important form of livelihood for rural and urban dwellers. In Nigeria, the quantity and quality of food produced is low. This has resulted in malnutrition which has been known to be the cause of high morbidity and mortality rates in the country. Livestock production is a socio – economic activity that could lead to improved income and raised the quality of living of Nigerians. (Akinola, 2009).

Human population is growing geometrically. Their survival depends solely on foods that are of plants and animal origin. This situation has prompted man to embarked on the husbandry of crops and animals. The products from these

crops and animals are majorly carbohydrates, proteins, minerals, vitamins, water and fats and oils. In compounding human and animal diets, these food nutrients are brought together in the right proportion. Man's interference with the environment via series of avenues like bush burning, deforestation, overgrazing, cultivation including other natural hazards has greatly affected the availability of these plants and animal related foods. Livestock are reared by man and their products constituted the richest source of protein in man's diet. This protein release, assist greatly in the replacement of worn out tissues in man. There are many cases of malnutrition and stunted growth among children, youths and adults in Nigeria arising from inadequate intake of these vital food nutrients especially protein in their diet. Animal protein from records and researches is noted to be highly rich in protein (Oluyomi, 2012; Emedo et al., 1995). It is recommended that every grown up should consume a minimum of 35kg of animal protein daily but the average Nigerians today only take 7kg (Idoko, 2011; Okoye, 1980 ; Akinyosoye, 1978). The low – level animal protein intake in Nigeria, and the rapidly increasing demand for livestock products could be alleviated through cattle production. This serious problem pinching most Nigerian household today is traceable to instability in government and economic proteins coupled with lack of available grazing lands for farm animals like cattle, sheep and goats (Emedo, et al., 1995; Okoye, 1980). An attempt to improve upon this anomaly necessitated the movement of nomads (herdsman) with their herds across vast areas of land including farmlands for fresh pasture and drinking water according to the dictates of the season hence the presence of nomadic herding in Kogi East Senatorial District of Kogi State. The seasonal movement of these animals may likely cause so many destructive effects on the ecosystem and the environment of the study area. It is against the above background that the researcher examines the possible effects of nomadic herding on the environment in Kogi East Senatorial District of Kogi State, Nigeria.

Purpose of the Study

The main purpose of the study is to examine the effects of nomadic herding on the ecosystem and the environment in Kogi East Senatorial District of Kogi State, Nigeria. Specifically, the study sought to:

1. Determine the effects caused by nomadic herding as perceived by farmers.
2. Determine the effects caused by nomadic herding as perceived by extension agents.

Research Questions

The following research questions were formulated based on the purpose of the study:

1. What was the perception of the farmers on the effects of nomadic herding on the environment?
2. What was the perception of the extension agents on the effects of nomadic herding on the environment?

Hypothesis

A null hypothesis (Ho) was formulated and tested at 0.05 level of significance as follows:

Ho₁ : There is no significant relationship in the perception rate between the farmers and the extension agents on the effects of nomadic herding on the environment.

METHODOLOGY

The study employed descriptive survey research design. The study population was made up of all Farmers and Agricultural Extension agents in the nine (9) Local Government Areas in Kogi East Senatorial District. 250 subjects were sampled using simple random sampling technique and used for the study. The sampled subjects were made up of 232 farmers and 18 extension agents drawn from the nine Local Government Areas that make up the study area. The selection of the subjects was well spread with the aim of reducing subject bias in responding to the items in the structured questionnaire, and also to minimize selection treatment interaction which would threaten generalizability. A four point rating scale of Farmers and Agricultural Extension Agent Questionnaire (FAEAQ) containing 21 items with Strongly Agree (SA); Agree (A); Disagree (DA) and Strongly Disagree (SD) options. The rating options was SA = 4; A = 3; DA = 2 and SD = 1 respectively. The structured questionnaire was in two sections (A and B). Section A comprised of four (4) items and was used to obtain general background information of the respondents while the section B containing twenty – one (21) items was used to provide answers to the two research questions formulated. The FAEAQ was validated by four (4) experts in Agricultural Science Education and Measurement and Evaluation drawn from Kogi State College of Education, Ankpa and University of Nigeria, Nsukka. The reliability of the instrument was determined by embarking on a pilot study involving 10 farmers and 5 Agricultural Extension Agents drawn from Kogi Central

Senatorial District of Kogi State. From the pilot study, Cronbach Alpha was used and a reliability index of 0.81 was obtained. In addition to the questionnaire, interview and personal observation was also employed. Two hundred and fifty (250) questionnaires were distributed to the sampled subjects with the help of extension agents attached to the communities and all were completely and correctly filled representing 100% return. Descriptive and inferential statistics were utilized to analyse the collected data used in providing answers to the two formulated research questions while Pearson Product Moment Correlation (PPMC) was used to test the relationship at $P > 0.05$ level of significance.

RESULTS AND DISCUSSION

Table 1. Mean response of farmers to the effects of nomadic herding on the environment

S/No	Variables	Mean (\bar{x})	Remarks
1.	Trampling lead to destruction of soil structure	3.10	Agree
2.	It accelerates soil deterioration	2.90	Agree
3.	It makes soil cultivation difficult	3.20	Agree
4.	Development of soil surface hard pan results	3.30	Agree
5.	Labour cost increases	2.78	Agree
6.	Overgrazing results	3.12	Agree
7.	Photosynthesis in crop plants is impaired	3.40	Agree
8.	Leads to destruction of the ecosystem	2.80	Agree
9.	Increase mortality rate of seedlings and crop plants	3.55	Agree
10.	Competition for land with other agricultural production	2.40	Disagree
11.	Breed pests e.g. ticks, flies etc	3.41	Agree
12.	Excessive grazing aggravate soil erosion	3.12	Agree
13.	Hinder air and water infiltration into the soil.	3.15	Agree
14.	Pollute environmental air through dust setting and dung.	2.95	Agree
15.	Increase cost of farm operations if the site is to be cleared and cultivated	3.80	Agree
16.	Disrupts interdependence relationship between soil faunas and floras.	2.71	Agree
17.	Heavy grazing pressure depletes the pasture of its valuable components	3.82	Agree
18.	Affect the attainment of high crop yield.	3.61	Agree
19.	Droppage of animal faeces pollute drinking water.	3.10	Agree
20.	Quicken loss of soil organic matter.	3.21	Agree
21.	Lead to loss of soil fertility.	2.98	Agree

N = 250, cut – off point or agree is $x \geq 2.50$ and above. —

Results from table 1 showed that items 1 – 21 with the exception of items 10 had mean scores above the cut-off point of 2.50, indicating that respondents had agreed that nomadic herding greatly affect our environment negatively. Although farmers agreed to all the items minus that of item 10, the response to items 2,5,8,14,16 and 21 was comparatively low indicating that farmers cannot effectively assess these effects as they lack the required knowledge for that. It may also be that all the farmers are not educated thus their inability for the effective assessment of such factors. Adah (2013) in agreement with this observed and stated that Education is a major instrument that stands to fight ignorance. Some of the farmers that are not educated may display less ability to think and provide intelligent response as compared to their counterparts who are well educated. However, the highest responses to items 1, 3, 4, 6, 7, 9, 11, 12, 13, 15, 17, 18, 19 and 20 with mean scores between 3.10 to 3.82 showed that those effects of nomadic herding are the most pronounced based on the perception of the farmers. Items 10 had mean score of 2.40 which is insignificant for recognition as one of the effects of nomadic herding perceived by farmers.

Table 2. Mean response of Agricultural Extension Agents to the effects of nomadic herding on the environment

S/No	Variables	Mean (\bar{x})	Remarks
1.	Trampling lead to destruction of soil structure	3.46	Agree
2.	It accelerates soil deterioration	3.33	Agree
3.	It makes soil cultivation difficult	3.12	Agree
4.	Development of soil surface hard pan results	3.50	Agree
5.	Labour cost increases	3.18	Agree
6.	Overgrazing results	3.20	Agree
7.	Photosynthesis in crop plants is impaired	3.23	Agree
8.	Leads to destruction of the ecosystem	3.16	Agree
9.	Increase mortality rate of seedlings and crop plants	3.40	Agree

10.	Competition for land with other agricultural production	3.22	Agree
11.	Breed pests e.g. ticks, flies etc	3.52	Agree
12.	Excessive grazing aggravate soil erosion	3.72	Agree
13.	Hinder air and water infiltration into the soil.	3.56	Agree
14.	Pollute environmental air through dust setting and dung.	3.46	Agree
15.	Increase cost of farm operations if the site is to be cleared and cultivated	3.10	Agree
16.	Disrupts interdependence relationship between soil faunas and floras.	3.15	Agree
17.	Heavy grazing pressure depletes the pasture of its valuable components	3.44	Agree
18.	Affect the attainment of high crop yield.	3.51	Agree
19.	Droppage of animal faeces pollute drinking water.	3.62	Agree
20.	Quicken loss of soil organic matter.	3.34	Agree
21	Lead to loss of soil fertility.	3.57	Agree

N = 250, cut – off point or agree is $\times 2.50$ and above —

Results from table 2 showed that there was a high response to items 1 – 20. Each of the items had mean score above 3.00. The high mean scores to the items showed that the Agricultural Extension agents perceived each of the items to be very significant. The Agricultural Extension Agents were all educated and this enhances their decision making ability and confidence level too. Item 12 had the highest mean score of 3.72 while item 15 had the lowest mean score of 3.10.

Test of Hypothesis

Ho₁: There is no significant relationship in the perception rate between the farmers and the extension agents on the effects of nomadic herding on the environment.

Table 3. Analysis showing significant relationship between farmers' and Agricultural Extension Agents Perception on the effects of nomadic herding on the environment

Σx	Σy	Σy^2	Σx^2	Σxy	r_{xy}	$r\text{-critical}$
454	750	37500	2916	40500	0.68	0.113

Pearson Product Moment Correlation Coefficient was used to establish the relationship between the responses of farmers and Agricultural Extension Agents. Results in table 3 revealed that the calculated r_{xy} value of (0.68) is greater than the critical value of (0.113) at 0.05 level of significance. Therefore the null hypothesis is rejected. This implies there is a significant relationship between the responses of the farmers and the agricultural extension agents.

Major Findings

The major findings from the study include the followings:

1. Kogi East Senatorial District is faced with the hazards of nomadic herding.
2. The perception of the Agricultural Extension Agents as per hazards done by nomadic herding is much higher when compared to that of the farmers.
3. The mean score perception of the Agricultural Extension Agents to 21 items of the questionnaire were all 3.12 and above while about six (6) of these items i.e. 2, 5, 8, 10, 14, 16 and 21 had mean scores below 3.00 considering the perception of the farmers.
4. From personal observation and interview conducted, complaints and disputes leading to court cases exist between the farmers and herdsmen in the study area.
5. There exist significant relationship in the mean responses between the Agricultural Extension Agents and the farmers on the hazards done to the environment by nomadic herding.

DISCUSSION OF FINDINGS

Kogi East Senatorial District Local Government Areas are currently witnessing hazards of nomadic herding based on the perception of both the farmers and agricultural Extension Agents, see tables 1 and 2. Table 1 and 2 shows some of the havoc done to the environment by nomadic herding as follows; reduction in soil aggregates; accelerating soil deterioration; development of soil surface hardpan; difficulty in soil cultivation; reduction of photosynthesis process in plants; increase in mortality rates in seedlings and grown up plants; pollution of drinking water with their faeces; breeding of pests; and aggravating soil erosion among others. These occurrences have led to 'seizure of available

farmlands development, from potential farmers. Prolonged existence of this development may automatically affects food availability for the growing population. This findings support earlier studies of Woodhead (1971); FMANR (1974); Andrew (1981); Micheal (1983) and Emedo et al. (1995) when they made similar observations that the continuous paddocking of animals on the environmental herbage, affects the future growth of vegetation which may invariably lead to loss of organic matter, increase in soil erosion, hardness of soil surface top, increase in labour cost during the process of tillage and complete desertification of farmland from crop production.

The perception rates of the Agricultural Extension Agents are much higher than those of the farmers. The disparity in their rating may be attributed to the fact that the Agricultural Extension Agents are more educated and understands the concepts more than the ordinary farmers. This agrees with Omede (2012) when he categorically stated that education is a great weapon that fight and help to wipe away ignorance. He further added that one's level of reasoning gets improved upon when exposed to education.

The results of personal observation and interview show that, series of complaints and disputes leading to court cases arises between the farmers and the herdsmen. This situation may be because; most farmers are pushed off from their farmlands without alternative land for use. Consequently, the tendency for these categories of farmers would be to resist the encroachment of the nomadic herdsmen. In support of this, Woodland (1971) stated that court cases are among the odd incidences common between the herdsmen and farmers during the wet season period when crop plants are trampled and destroyed by grazing animals.

Finally, the only hypothesis revealed that there is a significant relationship between the mean responses of farmers and that of the Agricultural Extension Agents on the activities of nomads. This is in agreement with Seidu (2010) when he stated that the activities and destructive effect of the nomads on the environment are very much apparent and visible. He further added that views of individuals cannot in any way differ as the effects are openly witnessed and experienced.

CONCLUSION

The activities of nomads have caused a lot of disequilibrium to the ecosystem as this has led to loss of soil resources, ceasation of farmers' farmlands, destruction and scaring away of other bush animals leading to reduction in the protein content in the diet of man. Similarly, the problem of nomads has now permeated our own immediate environment. To avoid a permanent damage and encourage food production to meet the growing population, a control strategy which will involve man's ability to interact and exploit the environment to his advantage need to be resorted to immediately. The recommendations given in this paper are worth giving trials.

RECOMMENDATIONS

Based on the findings and discussions of this study, the following recommendations are made:

1. Instead of depending on natural herbage, animal herdsmen should make use of sown pastures and cultivated fodders in addition to use of concentrates to feed their animals.
2. Government through Ministry of Agriculture and Natural Resources (MANR) should encourage the establishment of a ranch which will serve the purpose of breeding and fattening farm animals.
3. The government at both state and Federal level should consider the importance of establishing grazing reserve in almost all the local government areas.
4. Available grazing land should be increased through the effective treatment of large areas of woodland to open up for grazing throughout the year.
5. Increase fodder production through the over-sowing of improved forage species e.g. Gamba grass, stylosanthes spp, centrosema on the natural grassland.
6. The available grazing land should be effectively managed by embarking on rotational grazing.
7. The herdsmen should be compelled to receive nomadic education as this will assist in inculcating in them the habit of settlement.
8. Finally, efforts should be intensified by both Local, State and Federal Government to provide the populace the ideal environmental education. This can be done by updating the curriculum used in our schools and colleges.

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