



# Environmental Impact of Pastoral Nomadism on Crop Farming in Ohafia, Abia State, Nigeria

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## Abstract

This study assessed the environmental impact of pastoral Nomadism on crop farming in Ohafia, Abia State, Nigeria. A combination of purposive and multi-stage random sampling techniques were adopted to survey the eight directly affected out of the twenty-six communities in Ohafia Local Government Area. Primary data were sourced using structured questionnaire, a well planned non-participatory observation scheme and an in-depth interview for the non-literate respondents and the Nomads. The origin and migratory pattern of the Nomads were studied. The state of environment before and after the emergence of the nomads was compared. The size of farmlands overtaken by erosion and deforestation, farmers' expenditure to recover/enrich devastated farmlands and extra cost of re-cropping were estimated. The farm yields of affected farms were compared before and after the emergence of the nomads, and again with the yields from non affected farms during the same period. Results showed that the activities of the Nomads led to deforestation, erosion, desertification, hardening of top soil surface and loss of fertility among others. The litter from the livestock of the nomads served as manure in the farmlands but also created unsightly surroundings in addition to polluting community streams, children's play ground, shrines, church premises and village squares (recreation parks). Construction of sedentary or permanent resident for the Nomads and development of fiscal policy that shall provide the Nomads with user rights protecting them from being attacked by villagers are strongly advocated.

**Keywords:** Abia State; Crop Farming; Environment; Nomadism; Ohafia,

## Abbreviations:

FAO: Food and Agricultural Organisation

DFID: Department for International Development

PME: Planning Monitoring and Evaluation

NGN: Nigerian Naira

Hct. Hectare (of farmland)

## INTRODUCTION

The protein intake per caput per day in Nigeria dropped from 6.7gm in 1961 to 5.6gm in 1988 (F.A.O., 1993) and dropped lower in 1999 to less than 2.8gm (F.A.O., 2000). After the Nigerian Civil war, Nomads migrated southwards from Northern Nigeria in order to dispose of their cattle. Cattle that were not immediately disposed of were grazed on available vegetation and watered using communal water bodies. The Nomad settled down more around Ohafia, Okigwe, Awka and Oji River in the South Eastern Nigeria (Delgado, *et. al.*, 1999; Arua, 2000).

Although the origin of Nomadism in Nigeria pre-dates the civil war, the encroachment of the Nomads in the Ohafia (our study area) is closely tied to the end of the civil war (source. Over the years this practice of grazing has turned into a tradition with divergent tentacles. At Ohafia the pastoral Fulbe nomads of Nigeria have been identified (Njoku, 2001;

Awotona and Daramola, 1996). Generally, pastoral Nomadism has been closely linked to transmission of Zoonotic diseases (Coleman, 2002) and environmental issues (Hopen, 1958; Ezeomah 1983), and communal clashes between the host community and the Nomads (Arua, 2001; Njoku, 2001), etc.

The grazing and overgrazing of fields and farm lands by ruminant herds leads to vegetation depletion, tearing (in part) and hardening of farm/non-farm top soils, erosion and flooding, destruction of food and economic crops, loss of biodiversity and a host of other adverse environmental effects. The dung of the cattle poses health care hazards to the herds, the nomads and the host communities through whose farm lands and waters they transverse (DFID, 2006). In addition the dung is believed to desecrate shrines and church premises besides its assault on aesthetic sensibility. Clashes, harassment and even killings between the nomads and the villagers have been observed in Ohafia during the periods of 1995 and 2001 respectively (Arua, 2001).

On account of the implication of the culture, orientation and practices of the Nomads, the interest of policy makers had been aroused in the 1980's and 1990's (Alexander, 1997). Questions were asked about the possibilities of developing an ethic that shall effectively encourage sustainable nomadic intensification and diversification to go hand-in-hand with environmental protection (FAO, 2002). The objective of this study was to assess the environmental impact of pastoral Nomadism in Ohafia, Abia State.

## **METHODOLOGY**

### ***The Study Area***

The study area is Ohafia in Abia State. Ohafia covers over 176 square kilometres in the western part of middle Cross River uplands and marks a part of the eastern limit of Igbo land in that area in Southeast Nigeria. It is a border community consisting of 26 villages; Ohafia has both Igbo and non-Igbo neighbours (Kalu, 2000). The population of Ohafia has been rising over years. In the 1960's her population density was 500per sq/mile, but between the 1980's and 1990's it has risen from 124,000 people, to about 700per sq/km. (Ukaegbu in Anya, 1998; Njoku, 2001). However, the density may be higher than claimed because the hilly areas enforce a much heavier density on the available residential and cultivable lands. Features of rural-urban migration exist, because of the undulating and hilly character of the terrain (Njoku, 1981). Ohafia is bounded approximately by latitude 5 33' to 5 45' north; longitude 7 45' and 55' east (Kalu and Njoku, 1981).

Topographically, Ohafia is an area of undulating moderate hills (Anya, 1990). The climate of Ohafia is undeniably tropical; relatively hot all year round. Rainfall cannot be said to be even. Annual daily maximum and minimum temperature of about 31°C to 23°C respectively occur (PME report, 1997 please update this information). Ohafia possesses vegetation that is predominantly lowland rain forest (Okarima and Nwogu, 1997). The general land use pattern is communal, subsistence with attendant bush fallow system; land is cultivated by shifting slash and burn method with a ratio of two year's cultivation to five or seven years fallow to allow regeneration (Arua, 1981; Njoku, 2001). Although land may be leased at most minimal cost, it is never sold. The staple crop, the farming calendar, organization and unit of labour, the techniques and tools of production have not changed in any significant particulars. Yam (*Discorea* spp.) remains the king of crops, at least from a cultural perspective (Arua, 1981; Njoku, 2001). Tree crops and economic crops are enormous. In conclusion, crop farming in Ohafia shows a well-marked cycle of activities throughout the year commencing from November with clearing of farmlands and cultivation of yam, harvesting starts around August of the preceeding year (Arua, 1981). The Ohafia soils are poor in plant nutrients; the soil is generally porous and prone to erosion. The choice of the study area was informed by the fact that the nomads concentrated their activities in 8 out of 26 villages in (Kalu, 2000). Furthermore, in 2001, at the time of this study, there was a bloody clash between the pastoral nomads and the indigenes of Ohafia whose farm lands were affected either directly or indirectly.

### ***Sampling Procedure***

A combination of purposive and multi-stage random sampling techniques was adopted for this study. Out of the 26 villages in Ohafia, 8 of these villages, which were the only affected villages, were purposively selected.

### ***Selection of Project Villages***

Out of 8 eight villages, 3 were selected; these are Amaekpu, Ebem and Elu Ohafia. Three villages were also selected from the non-affected villages, these are Akanu, Uduma Awoke and Okon; making a total of 6 villages

### ***Selection of Farmers***

Farmers were sampled by the convenience method; being that most farmers were un-cooperative claiming that the Abia State Government failed to pay a promised compensation for their damaged farmlands and crops. However, proper representation of the population and validity of the sample figures were ensured. A total of 72 farmers were sampled; 12 from each village.

### ***Interaction with Nomads***

The Nomads were mostly illiterate. Questions contained in the questionnaire were administered to 20 out of 50 Nomads by oral interviews, because the Nomads were mostly illiterates.

### ***Data Collection and Analysis***

Data for this study was sourced and collected from both primary and secondary sources. The primary data were sourced using structured questionnaires, a well-planned, non-participatory observation scheme and an in-depth interview for the non-literate respondents. 72 (12 from each of the six villages) copies of questionnaires were administered to Ohafia crop farmers but fifty were recovered. Secondary data were sourced from very relevant publications.

Descriptive statistics such as means, percentages and standard deviation was utilised to present the data.

## **RESULTS**

There are only limited works on the environmental impact of pastoral Nomadism on agriculture in Nigeria, with reference to Ohafia in Abia State. However, this study investigated the measurable impacts of operations of the Nomads on the environment and farming industry in Ohafia, Abia State.

### **Preliminary Socioeconomic Description of Ohafia Farmer Respondents**

There are more female (60%) than male (38%) farmers; with 54% married, 20% widowed and 12% divorced and 12% unmarried. About 56% of the respondents are above 50 years old. Illiteracy level is high since only about 25% of the farmers possess post secondary school education. Female respondents make up about 68% of the less than secondary school level respondents. Family size is high averaging 9 persons, with about 63% polygamy among married farmers. A cross match of farm size with marital status reveals that widows own the least amount of farmlands even when they have potential for expansion. The elites, especially men, amass a large amount of land for themselves. Majority (82%) of the farmers practice multi-cropping shifting cultivation or bush fallowing. Although monoculture exists with some patches of crop rotation, there are few traces of continuous-cropping. About 68% of the farmers operate full time whereas 32% are part time farmers

### ***Socio-economic Description of Nomads***

The Nomads were mostly illiterate. About 10% of the Nomads had settled down in Ohafia; married to Ohafia women and were raising children. The Nomads men married Ohafia women but Ohafia men did not marry Nomads women. Average herd size was 40 Cattle. Majority of the Nomads enjoyed protection from the Military base at Ebem, Ohafia and so did not foresee leaving Ohafia.

### **Environmental Implications of Pastoral Nomadism**

Results of oral interview showed that the environmental impact of Nomadism depends on the capacity and types of animal in the nomads' herd; secondly, the length of time the herds stay in a particular village before continuing with their journey, and thirdly, the vicinities (referring to soil type) of the village that forms their migratory route.

About 56 percent of the nomads possess cattle, sheep and goat; 16%, cattle and sheep only; 14% possess cattle only

and 6% possess cattle, sheep, goat and family. The average herd size is about 50 animals, although Nomads reported 40 animals. One adult nomad can own about 2 to 3 herds. As at the time of this study in 2001 there were over 50 nomads living in Ohafia with their families. So, there are well above 2,500 animals roaming freely in these 8 villages of Ohafia.

Different animals cause different types and intensities of damage. A herd of cattle only graze scantily but trample heavily to destroy crops and cause hardpan on ground. A ground with porous topsoil may erode after all. Sheep and goats however, are usually thorough in grazing because they nib off young buds of crops, eat leaves, and uproot young cassava stems. A combination of these three animals in one herd constitutes a thorough devastation in a visited food crop farm.

On duration of stay, 6% of the respondents claimed that these nomads who entered into Ohafia with their family members intend to settle down perpetually in Ohafia. About 12% of these nomads spend unlimited periods of time. 12% spend 0-3 months, 4% spend 4-7 months and 8% spend 8-12 months in Ohafia. During this period the nomads hoof freely across the village depositing defecates along roads, play grounds, drinking streams and sacred premises like Churches and Shrines. Furthermore, about 58% of the respondent farmers claimed that nomads arrived Ohafia from 1970-1985 and about 28% claimed that the nomads arrived Ohafia from 1986 to 2000.

This study showed that 80% of the pastoral nomads do not possess paddocks and so roam through the village farmlands, streams, play ground, shrines, church premises and market places in search of pasture water and shades from the heat of the day and the cold of the night. Majority of the crop farmer in the 8 affected villages recorded either direct or indirect losses due to the activities of the nomads.

About 88% of the farmers reported deforestation, 90% erosion, 86% and desertification 86% pollution of soil and water in Ohafia. About 80% of the crop farmers noticed pollution of play ground, 90% noticed hard pan, 84% noticed stunted growth and 82% noticed loss of soil fertility in their farmlands (Table 1). Furthermore, about 64% and 36% of the respondents first noticed deforestation in (1-5) and (6-10) years respectively. Pollution of soil, water and play grounds in Ohafia dates beyond 10 years considering that 90, 96 and 98 percentages of the respondents respectively claimed so. Development of hard pan, loss of soil fertility and stunted growth of plants was first noticed about 1-5 years before 2001 (research time) considering that 44%, 84% and 80 % of the farmers attest to this (Table 2).

The mean expenditure for enrichment and recovery of soil fertility after devastation by Nomads was NGN13, 350.00 (2,500-32.5) per hectare (Table 3). These funds were utilized to purchase fertilizer to enrich farm lands, purchase and planting of cover crops to check erosion, building of cross bars to check erosion, purchasing and planting trees in the farm lands.

About 18%, of crop farmers lost about 1-5; 26% lost about 6-10; 8% lost about 11-15; 6% lost about 16-20, and 2% lost about 21-25 hectares of farmland to erosion and desertification (Table 4).

About 14% of crop farmers generated NGN 499, 500.00; 6% generated NGN 699,500; 14% generated NGN 899,500 and 2% generated NGN105, 000.00 from farms free from nomadic devastation. But, about 2% 5%, 7% and 22% of farmers generated on the average NGN 79,500; NGN 59,500; NGN 39,500 and NGN 19,500 respectively from farms that suffered nomadic devastation. None of the affected farmers generated up to N90, 000 from sales of farm produce since after the advent of Nomadism. From calculation, the mean farm loss per hectare is 26.87% (Table 5). Mean Revenue generated from farms unaffected by Nomadism = N 844.72;

## DISCUSSIONS

There are more female than male crop farmers in Ohafia majority of which are of ages above 50 years old. Gender biases against women on allocated size of farmlands exist in Ohafia. Illiteracy level and average family sizes are high. Agricultural system is subsistent but fast developing. Greater number of farmers operate full time than part time thus, a disruption in normal farming programme like famine, or nomad devastations results in gross negative socio-economic. Majority (82%) of the farmers practice multi-cropping shifting cultivation or bush fallowing; this latter point agrees with Arua (1981) and Njoku (2001) who claim that in Ohafia land is cultivated by shifting slash and burn method with a ratio of two year's cultivation to five or seven years fallow to allow regeneration .

The Military Barracks at Ebem Ohafia afforded the Nomads needed psychology of security for their animals and family. The nomads in Ohafia have cattle, sheep and goat in their flock and their family. This finding disagrees with the earlier claims of Baker (1970) that these nomads wander with only cattle. They also wander with their families such that it is the young boys who actually hoof the animals whereas the women stay back in their "home" to take care of the other flock. Interesting socio-cultural developments exist at Ebem Ohafia where some of the male nomads are married to Ohafia women but not vice versa. By 2001, the time of this research, no pastoral Nomad possessed a paddock or any form of enclosure for their animals. Their migratory adventure and settlement are not definite as their itinerary, which encompasses farmlands, stream, sacred forest, churches e.t.c, depends largely on availability of nourishment and water

for their animals. Excreta from these herds apart from constituting aesthetic unacceptability, serve as medium for transmission of infectious (animal to animal) and Zoonotic diseases (animal to man).

Environmental impacts of Nomadism include, among others, deforestation, erosion and desertification, pollution of soil, water and play grounds, development of hard pan, loss of fertility, stunted growth of food crops and destruction of cash crops. Responses of farmers to these nomad impacts vary from spending extra money to check erosion and enhance the fertility of depleted farmlands to abandonment of farmlands, which they considered irretrievable. Several disputes and fighting between the villagers and the nomads were recorded in Ohafia, for example in 1995 and in 27th April 2001. And usually, in each case, losses of both animals and human lives are recorded

## RECOMMENDATIONS

Being that about 75 percent of the farmers did not complete secondary school education, adult literacy programmes is strongly recommended. Crop farmers in Ohafia should adopt mechanised mixed farming instead of mono cropping and shifting cultivation. Formation of Cooperatives in order to access soft credits is very essential. Since Nomads contribute about 95% of cattle consumed in Nigeria, Nomads should not be made to leave Ohafia or any other parts of Nigeria that they exist. Instead an integrated scheme of agro-pastoral animals farming both by use of ranches or enhanced mixed farming should be developed and adopted by nomads and crop farmers especially in Ohafia and the entire southern agricultural zones. To manage encroaching deforestation planting of trees within and around their farmlands and the entire community is strongly recommended

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**Table 1:** The Distribution of crop farmers According to their Perception of Changes in their Farms.

| Type(s) of Change                | Frequency |    | Total | Percentages |    | Total |
|----------------------------------|-----------|----|-------|-------------|----|-------|
|                                  | Yes       | No |       | Yes         | No |       |
| Deforestation                    | 44        | 6  | 50    | 88          | 12 | 100   |
| Erosion and Desertification      | 45        | 5  | 50    | 90          | 10 | 100   |
| Pollution of Soil                | 43        | 7  | 50    | 86          | 14 | 100   |
| Pollution of Water               | 43        | 7  | 50    | 86          | 14 | 100   |
| Pollution of Play Ground         | 40        | 10 | 50    | 80          | 20 | 100   |
| Hard pan (difficulty in tillage) | 45        | 5  | 50    | 90          | 10 | 100   |
| Stunted growth of plants         | 42        | 8  | 50    | 84          | 16 | 100   |
| Loss of soil fertility           | 41        | 9  | 50    | 82          | 18 | 100   |

**Table 2.** The Distribution of Farmers according to the time they first noticed changes in their farms

| Type(s) of Change                | Period First Noticed |      |          |       |             |       |          |       |
|----------------------------------|----------------------|------|----------|-------|-------------|-------|----------|-------|
|                                  | Frequency            |      |          |       | Percentages |       |          |       |
|                                  | 1-5yrs               | 6-10 | Above 10 | Total | 1-5yrs      | 6-10  | Above 10 | Total |
| Deforestation                    | 32                   | 18   | 0        | 50    | 64.00       | 36.00 | 0.00     | 100   |
| Erosion and Desertification      | 38                   | 12   | 0        | 50    | 76.00       | 24.00 | 0.00     | 100   |
| Pollution of Soil                | 0                    | 5    | 45       | 50    | 0.00        | 10.00 | 90.00    | 100   |
| Pollution of Water               | 0                    | 2    | 48       | 50    | 0.00        | 4.00  | 96.00    | 100   |
| Pollution of Play Ground         | 0                    | 1    | 49       | 50    | 0.00        | 2.00  | 98.00    | 100   |
| Hard pan (difficulty in tillage) | 22                   | 18   | 10       | 50    | 44.00       | 36.00 | 20.00    | 100   |
| Stunted growth of plants         | 42                   | 7    | 1        | 50    | 84.00       | 14.00 | 2.00     | 100   |
| Loss of soil fertility           | 40                   | 10   | 0        | 50    | 80.00       | 20.00 | 0.00     | 100   |

**Table3.** Mean Expenditure in Enriching/Recovering devastated Farmland and Extra Cost of Re-Cropping.

| Interval expense (1000) | X     | Frequency | FX    | Percentage |
|-------------------------|-------|-----------|-------|------------|
| 0-5                     | 2.5   | 12        | 30    | 24.00      |
| 6-11                    | 8.5   | 11        | 93.5  | 22.00      |
| 12-17                   | 14.5  | 06        | 87    | 12.00      |
| 18-23                   | 20.5  | 04        | 82    | 08.00      |
| 24-29                   | 26.5  | 01        | 26.5  | 02.00      |
| Above 30                | 32.5  | 06        | 195   | 12.00      |
| Non response            | ----- | 10        | 20.00 | -----      |
| Total                   | ----- | 50        | 534   | 100.00     |

Efx = 534, EF = 40; Efx/EF= 534/40 = 13.35, Average extra cost = 13.35 x N1000.00 = N13, 350.00

**Table 4.** Size of Farmlands overtaken by erosion and desertification due to Nomads activities for periods of 1995- 2001 AD.

| Interval\hectares | Frequency | (X) | (FX) | Percentages |
|-------------------|-----------|-----|------|-------------|
| 1-5               | 09        | 3   | 27   | 18.00       |
| 6-10              | 13        | 8   | 104  | 26.00       |
| 11-15             | 04        | 13  | 52   | 08.00       |
| 16-20             | 03        | 18  | 5    | 06.00       |
| 21-25             | 01        | 23  | 23   | 02.00       |
| Non response      | 20        | 0   | 0    | 40.00       |
| TOTAL             | 50        |     | 260  | 100.00      |

Mean (x) = Efx/EF = 260/30 = 8.7 hectares of farmland.

**Table5.** Comparison of Revenue generation from Nomad free and Nomad affected Farms

| Farms unaffected by the Nomads |       |       |        |          | Farm affected by the Nomads |       |        |          |
|--------------------------------|-------|-------|--------|----------|-----------------------------|-------|--------|----------|
| Revenue\hct (NGN)              | Mean  | Freq. | %      | FX       | Revenue\hct. (NGN)          | Freq. | %      | FX       |
| 400-599                        | 499.5 | 07    | 14.00  | 3496.5   | 10-29                       | 22    | 44.00  | 10,989.0 |
| 600-799                        | 699.5 | 09    | 06.00  | 6295.5   | 30-49                       | 07    | 14.00  | 4,896.5  |
| 800-999                        | 899.5 | 08    | 14.00  | 7196.5   | 50-69                       | 05    | 10.00  | 4,497.5  |
| 1000-1100                      | 1050  | 16    | 02.00  | 16800.0  | 70-89                       | 02    | 04.00  | 2,100.0  |
| Non response                   |       | 10    | 64     |          | Non response                | 14    | 28.00  |          |
| Total                          |       | 50    | 100.00 | 33,788.5 | Total                       | 50    | 100.00 | 22,483.0 |

Mean Revenue generated from Farm affected by Nomadism = NGN624.52; Difference in Mean = 844.72-624.52= NGN 220.20  
Percentage mean loss 220.20\844.72 X 100% =26.87%

**NOTE: Revenue is measured in thousands of Naira\Hectare of land.**