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Effects of Urban Encroachment on Rural Agricultural Land: A Case Study of Ibie-Nafe Community of Edo State, Nigeria

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Abstract

Urban expansion constitutes one of the key agents of land-use change with the impact felt at local, regional and global levels; such impact includes spatial growth on agricultural land. This study assesses the effects of urban encroachment on rural agricultural land in the Ibie-Nafe Community Area of Edo State, Nigeria. The methodology adopted for the study is empirical research in which primary and secondary data were used for the study. On the other hand, findings show that the spreading of urban areas on farmlands causes new farmland reclamation and accelerated deforestation in the surroundings. In addition, the displaced farmlands do not ensure food production because of both reclaiming farmlands on infertile lands and diversifying farming activities from grain production to market-oriented ones. The accelerated urbanization and farmland displacement are driven by profit-oriented development strategy and ineffective land use planning. Against this background, there is a need for an adequate understanding of the interplay between trends of urbanization and undermining agricultural land use within rural areas.

Keywords: Encroachment, Agricultural land, Rural, Urban, Land-use, Farmland.

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Ethical: This study follows all ethical practices during writing.

Contents

Contribution of this paper to the literature
This study assesses the effects of urban encroachment on rural agricultural land in the Ibie-Nafe Community Area of Edo State, Nigeria.

1. Introduction

The world is rapidly urbanizing, and it has witnessed a tremendous shift of its population from being predominantly rural to predominantly urban in the last two decades [1]. The world's population is estimated to be 7.01 billion and by the year 2030, more than 60% of this population was being living in urban areas especially in developing countries, consuming close to three-quarters of the world's natural resources, and generating three quarters of its pollution and wastes [2, 3]. This growth will require unprecedented investment in new infrastructure and create serious challenges for political and social institutions.

Urban Encroachment on agricultural lands has become a global phenomenon plaguing all countries of the world, rich or poor [4]. This phenomenon formed a challenge to most countries of the world, especially developing ones, because of the increasing in population at high rates, consequent in depletion of resources, especially agricultural lands around cities. The country with limited natural resources, agriculture is the primary resource in achieving food security; cultivation of agricultural land is the source of living for many families, like other developing countries, dramatically urban expansion in the last decades of the twentieth century increased as a result of natural increase of the population [5]. When the population increases, it leads to increase in the demand of lands for housing and human services. Thus, the agricultural lands started decreasing day by day, and the rapid cultural transition and population growth have transformed the traditional dependency between people and the environment in Nigeria, as a result of urbanization, with the absence of proper planning [6]. Presently, the fast urban growth in Nigeria is affecting approximately 400,000 hectares of vegetative cover every year Adesina [7]. Heimlich and Anderson [8] observed that urban growth encourages encroachment blueprint, which most of the time possess negative effects on the ecology of the region, particularly in vegetative, hydro-geomorphology and food insecurity [9]. Food security according to Adesina [7] exists when every human, whatever the time, possess both economic and physical access to adequate, secured and wholesome food to meet up the standard dietary requirements and choice of food they prefer for a vibrant and vigorous living'. The transformation of agricultural lands to other land uses is a threat to food security, for instance, in one of the Chilean city, about 1,734 hectares of wetlands and 1,417 hectares of agricultural land were transformed into residential areas between the years 1975 to 2000 [10].

Rapid expansion of urban centre in Estako-West mostly in places like Auchi, Ibie Nafe, Aviele and environs pose great challenges such that evokes interests from ecologists, planners, civil engineers, sociologists, administrators and policy makers on how much expansion is taking place, the effects on agricultural land and possible solution. This study focuses on such effects on the encroachment of agricultural land and suggests some mitigation measures.

2. Materials and Methods

2.1. Research Design

Data collection, analyse and interpretation are components of any study. This will assist in achieving best and consistency in the trend of events and points to be investigated. For the purpose of this research work, various techniques and procedures were being used to source relevant data that would revitalize the issue of infrastructure provision in the study area.

2.1.1. Survey Methodology

An in-depth study was being carried out in the study area to determine the rate of urban encroachment on agricultural land in the study area. This was achieved through direct interview and observation and by using structured questionnaire.

2.1.2. Reconnaissance Survey

A technically-based investigation was carried out in the study area to determine the area of coverage and the existing land use, physical condition of the place and its management mechanism. This was being done via observation; interview and a detailed questionnaire which was being administered so as to get the necessary information that would be required concerning the study area.

2.2. Population

Ibienafe is a village located in Estako West Local Government Area in Edo State, Nigeria, having a total land area of 554.222hectares [11]. The community consists of 12,311 persons as shown by the 2006 population census. Having a growth rate of 2.7%, a projection to 2019 showed the present population to be 17,408 persons. The study area is shown in Figure 1a-d, and the encroachment of agricultural land is showed in Figure 2e-h.

2.3. Sample Size

The population of the research covered the residents of the study area. A sampling size is a subset of the population of the study selected for observation and analysis. A sample is a portion or specimen of larger group selected in such a way that attribute exhibited by smaller group are accepted as a representative of the whole group. A total of 100 questionnaires was being administered, using a sample size of 0.6% of the total residents. The questionnaire was administered randomly across Ibie-nafe Community. The satellite imagery in Figure 1d indicates the data comparing the urban development and encroachment of agricultural in the study area.

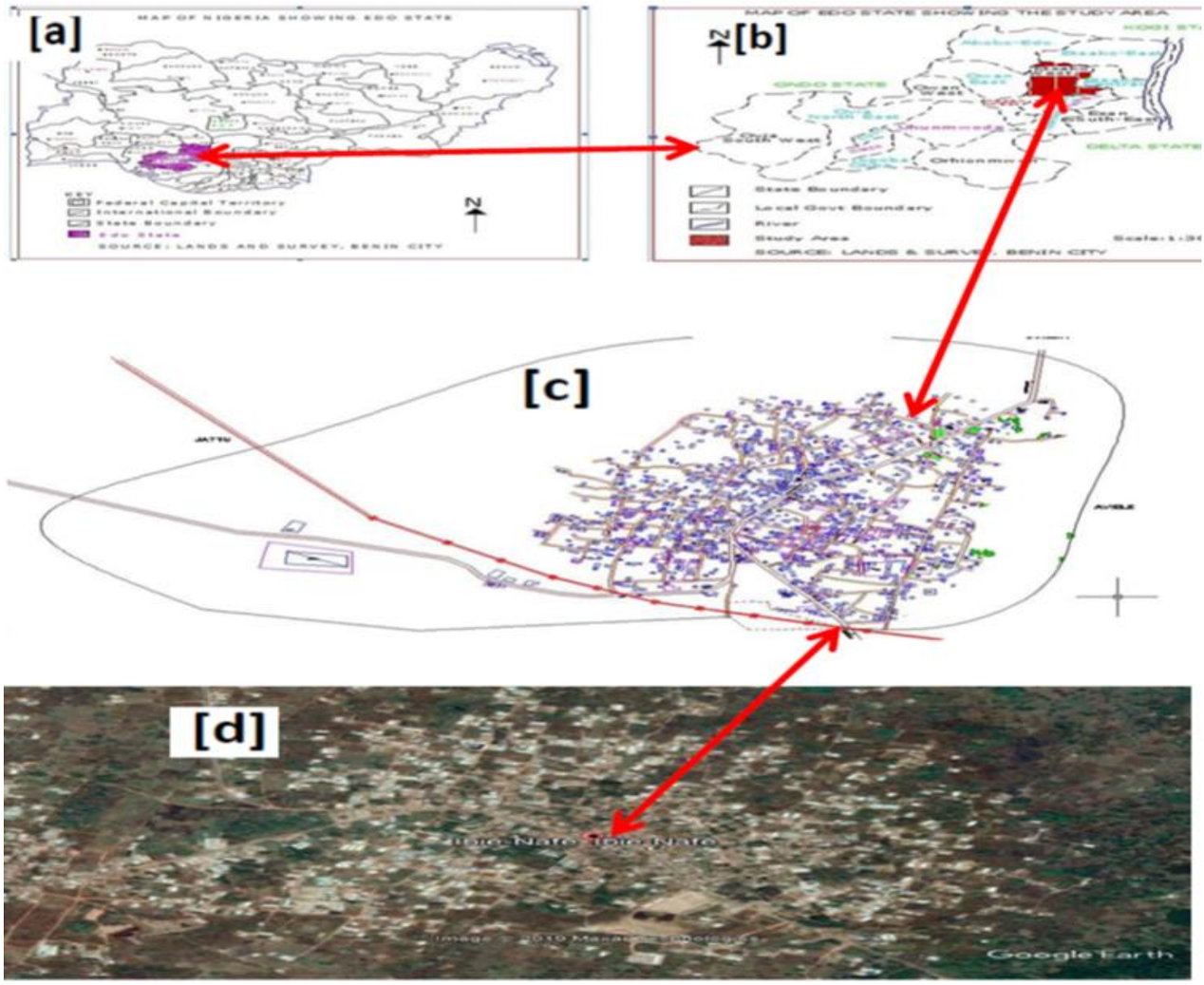

Figure-1. Map of Nigeria showing Edo State (a), Map of Edo State showing Estako-West (b), Baseline map of Ibie-Nafe community (c); and satellite imagery showing the existing built up area of Ibie-Nafe community of Edo-State (d).
Source: Ministry of Land & Survey, Benin City, 2017.

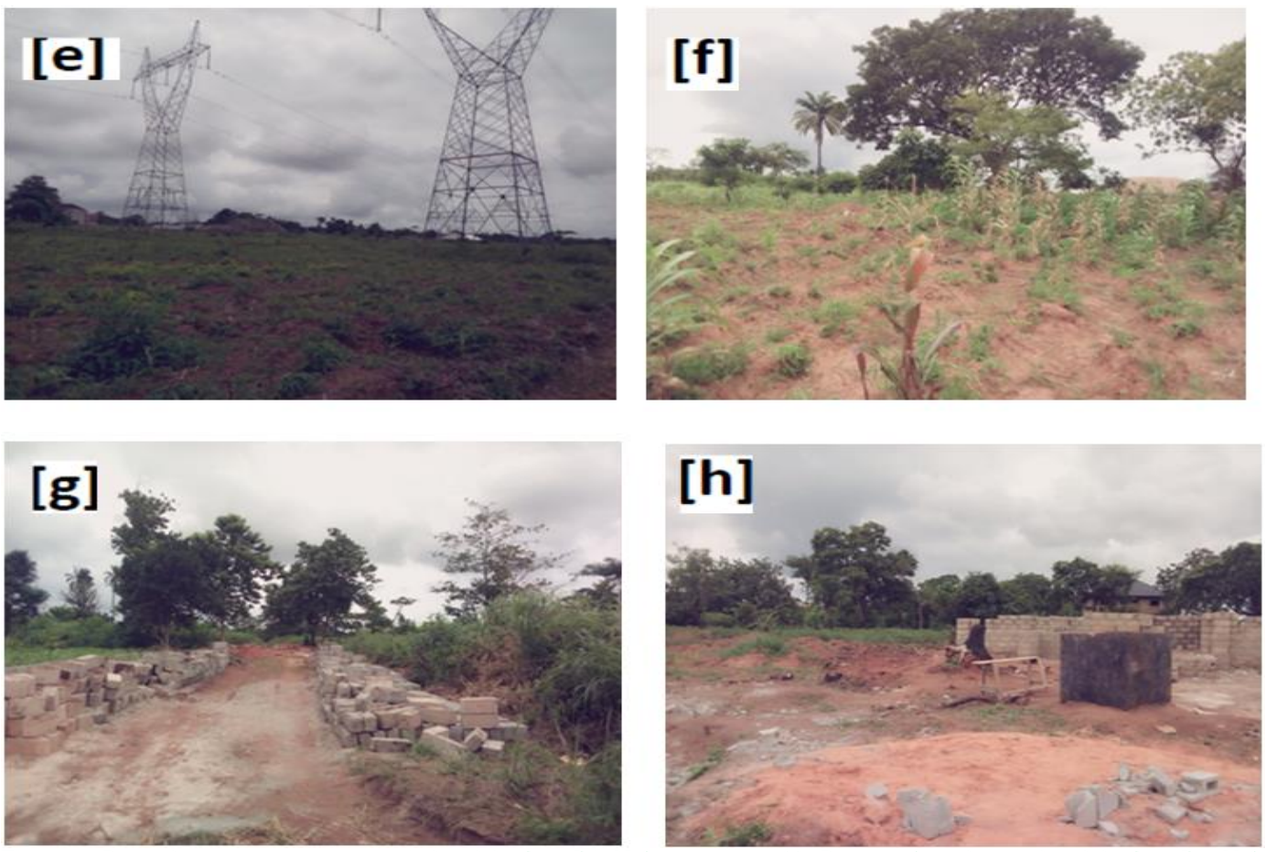

Figure-2. Power line transmission on agricultural land at Ibie-Nafe community (e), Portion of rural agricultural land at Ibie-Nafe community (f), Building materials on site for construction on agricultural land at Ibie-Nafe (g), and Building construction ongoing on agricultural land at Ibie-Nafe.
Source: Ministry of Land & Survey, Benin City, 2017.

2.4. Data Analysis

The response rate for each item in the questionnaire and site observation schedule, and the overall percentage of return from the sample size was determined. The data obtained was being analyzed using Statistical Program for Social Sciences (SPSS). The analyzed data will finally be presented using descriptive methods for easy interpretation and enable comparisons and inference to be drawn.

3. Results

3.1. Demographic Responses

The output of the administered questionnaire showed that 96 out of 100 retrieved questionnaires were analyzable. The result is sequentially presented according to the order in which they were organized based on the questionnaire administered. In Table 1 and Figure 3a show the total number of male respondents totaling 62 which represents 64.6% of interviewed people, whereas a total number of 34 female respondents which indicates 35.4% was also interviewed. Therefore, it is deduced that more men responded than women.

Table-1. Sex of respondents.

Sex	Respondents	Percentage
Male	62	64.6
Female	34	35.4
Total	96	100

Source: Field survey, 2019.

Table-2. Ages of respondents

Age range	No of respondents	Percentage (%)
18-28	8	8.3
29-28	18	18.3
39-48	19	19.3
49-58	32	33.3
59-above	19	19.8
Total	96	100.0

Source: Field survey, 2019.

Out of the total number of 8 respondents which represent 8.3% of the population are between 18-28years. While 18 respondents (18.8%) of the population are between 29-38years. 19 respondents (19.8%) of the population are between 39-48years. 32 respondents (33.3%) of the population, are between 49-58 and 19 respondents (19.8%) of the population are 59 years and above. Table 3 shows the marital status of the respondents used for this study. 22 respondents, which represent 22.9% of the population, are Single, 53 respondents (55.2%) of the population, are married, 9 (9.4%) of the population are divorce, and 12 respondents (12.5%) of the population are widowed Figure 2b.

Table-3. Marital status of respondents.

Status	Number of respondents	Percentage
Single	22	22.9
Married	53	55.2
Divorce	9	9.4
Widowed	12	12.5
Total	96	100%

Source: Field survey, 2019.

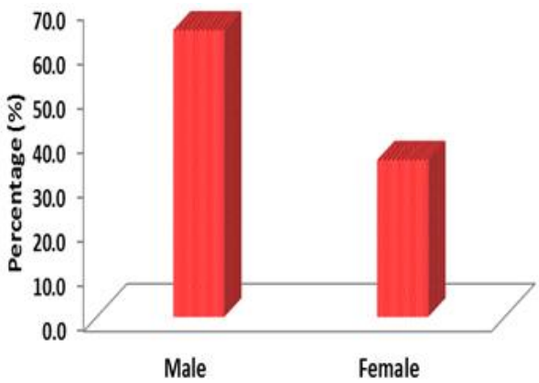

Figure-3a. Sex of the respondents.

Source: Output analysis, 2019.

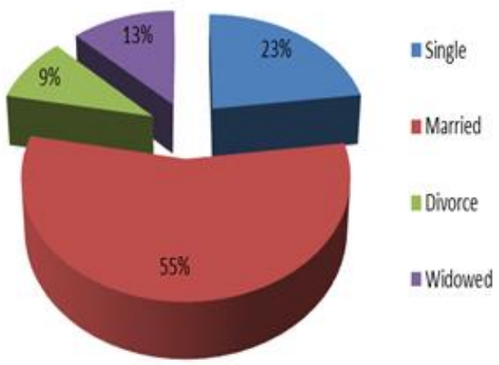

Figure-3b. respondents martial status.

Source: Output analysis, 2019 .

The result in Table 4 shows the respondent's position in the household used for this study. Forty seven (47) respondents (49%) of the population are Head, 23 respondents (23.9%) of the population are spouse, 12 respondents (12.5%) of the population are relative, 10 respondents (10.4%) of the population represents child and 4 respondents (4.2%) of the population are categories under others specify. Conversely, 9 respondents (9.4%) of the population are civil servants, 11 represent (11.5%) of the population are self-employed, 14 respondents (14.6%) of the population are unemployed, 19 respondents (19.7%) of the population are traders, 7 respondents (7.3%) of the population are retired, 24 respondents (25%) of the population are farmers, 5 respondents (5.2%) of the population are artisan and 7 respondents (7.3%) of the population are students.

Table-4. Respondents position in the Household.

Status	Number of respondents	Percentage
Head	47	49
Spouse	23	23.9
Relative	12	12.5
Child	10	10.4
Others specify	4	4.2
Total	96	100%

Source: Field survey, 2019.

Table-5. Occupation of respondents.

Status	Number of respondents	Percentage
Civil Service	9	9.4
Self Employed	11	11.5
Unemployed	14	14.6
Trading	19	19.7
Retired	7	7.3
Farming	24	25
Artisan	5	5.2
Student	7	7.3
Total	96	100%

Source: Field survey, 2019.

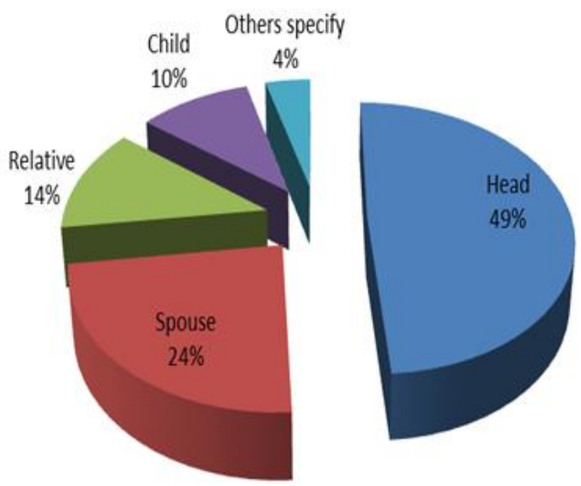

Figure-4a. Respondents position in the household.
Source: Output analysis, 2019.

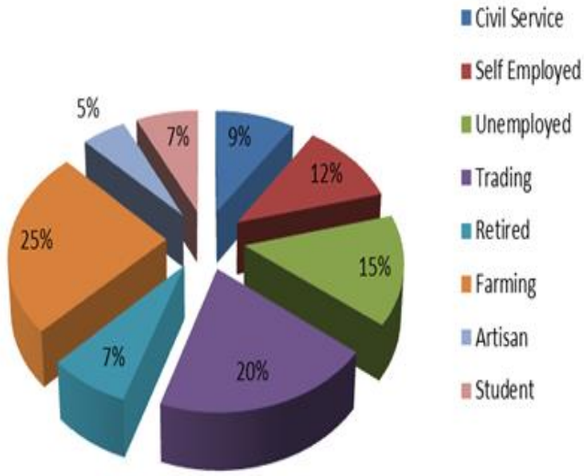

Figure-4b. Occupation of respondents.
Source: Output analysis, 2019.

3.2. Causes of Encroachment of Agricultural Land

The causes of agricultural land encroachment in the study were identified. The result in Table 6 showed that 57 respondents (59.4%) indicated that migration is the major source of encroachment, while 21 (21.8%) and 18 (18.8%) of the respondents showed that natural birthrate and urbanization could cause agricultural land encroachment. The result in Table 7 shows that current agricultural land use dynamics has the highest residential use as indicated by the respondent. A total number of 8 respondents (8.3%) represent the land use for farming only, while 42 respondents (44%) represent residential land use. Also, residential and mixed land use represent 29% of 28 respondents, while 18 respondents (18.7%) indicated other land use activities.

Table-6. Causes of encroachment on agricultural land.

Causes of encroachment on agricultural land	Number of respondents	Percentage (%)
Migration	57	59.4
Natural Birth rate	21	21.8
Urbanization	18	18.8
Total	96	100

Source: Field survey, 2019.

Table-7. Current agricultural land use dynamics.

Current agricultural land use dynamics	Number of respondents	Percentage
Farming Only	8	8.3
Residential only	42	44
Residential and Mixed use	28	29
Others Specify	18	18.7
Total	96	100%

Source: Field survey, 2019.

3.3. Effects of Encroachment on Food Security and Land Acquisition

The result in Table 8 shows the responses to the effects of encroachment on food security and land acquisition. A total number of 57 respondents which represent 59.3% of the population agreed that encroachment could cause food insecurity, whereas 18 (18.8%) of the population were of different opinion. Finally, 21 respondents (21.9%) were indifferent on the possible negative effects of encroachment on food security. However, the results in Table 9 show the responses of the dwellers to the effect of encroachment on land acquisition. A total number of 63

respondents from the 96 of the population indicated that encroachment has effect on land acquisition, whereas 12 respondents (12.5%) of the population disagree on land acquisition and encroachment, and 21 (21.9%) of the population were indifferent.

Table-8. Effects of encroachment on food security.

Effect of encroachment on food security	No of respondents	Percentage (%)
Yes	57	59.3
No	18	18.8
May be	21	21.9
Total	96	100.0

Source: Field study, 2019.

Table-9. Effects of encroachment on land acquisition.

Effect of encroachment on land acquisition	No of respondents	Percentage (%)
Yes	63	65.6
No	12	12.5
May be	21	21.9
Total	96	100.0

Source: Field study, 2019.

4. Discussion

Ibie-Nafe Community of Etsako West Area, of Edo State, is experiencing many socio-economic and political changes that are impacting negatively on the ecological landscape. In the area of agricultural sector as assessed in this study, the following observations are noteworthy. The rate of urbanization is taking its toll on IbieNafe Community of Etsako West Area, of Edo State faster than envisaged by the Planning Authority and even the administrators. The urbanization growth rate of the area is increasing significantly from 2% annually between 1991 to 2.7% annually between 2018 and 2019. Developmental activities are encroaching into the agricultural lands at an alarming rate annually. If of this growth rate continues, it implies that by the year 2030, agricultural land (arable land, farmable land and forest) would have further been lost to urban encroachment. Erections of power line were also identified as a major agent of change in the area due to the large Industrialization activities within the area, which has led to loss Rural Agricultural in Ibie-Nafe Community.

5. Conclusion

It is evident from the above analysis that the population growth has changed the land use pattern of the city. Agricultural land is being gradually converted into built-up land like industrial, residential, commercial and other urban uses without any systematic development plan. Similarly, the household area has been converted into agricultural and built up area. These problems require immediate attention of the planners and administrators. The encroachment of the community leaves marked impact on the land use pattern, which has shown tilt towards built-up areas, which is growing in an unplanned way along the main roads. The rate, at which agricultural land is being destroyed, needs serious thinking on part of planners and policy makers. The population growth of the community and encroachment has changed internal morphology of the community.

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