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ARTICLE

Assessment of Stakeholders' Perceptions of Landuse/Landcover Change Drivers in Abuja, Nigeria

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ABSTRACT

Landuse/Landcover (LULC) changes are recognised as some of the major causes of environmental problems like land degradation and climate change. To achieve sustainability, we need to properly understand such changes in order to have adequate information that will enable us to design and implement measures to mitigate their negative impacts. Doing this particularly requires a proper understanding of how stakeholders perceive the changes in general and their drivers in particular. Unfortunately, not much is known in many areas about the perspective of landuse stakeholders on drivers of LULC changes. This paper reports the results of a study conducted to examine the perceptions of different landuse stakeholders on drivers of LULC changes in Abuja Federal Capital Territory, Nigeria. A questionnaire survey was utilised, involving 514 households across four settlements, 2 rural (Karshi and Orozo) and 2 urban (Nyanya and Karu) towns in the territory, which were complemented with Focus Group Discussions conducted. The results obtained showed that urban dwellers are largely aware of drivers of changes in socio-economic drivers (physical development on lands, more commercial complex development and more institutional development). Rural dwellers are largely aware of environmental drivers of LULC changes (bush burning, livestock overgrazing, collections of wood and medicinal plants, and agricultural expansion). It was concluded that there is a need to bring about a harmonisation of the perceptions of LULC change drivers by the rural and urban dwellers so as to bring about a common front understanding and response to LULC changes in the study area.

1. Introduction

Landuse and land cover are sometimes used interchangeably but quite refer to different things. Land use involves how the biophysical attributes of the land are manipulated and the intent underlying such manipulation for which the land is used, whereas land cover implies the biophysical state of the earth's surface and immediate subsurface including biota, soil, topography, surface

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and groundwater, human structures etc. [1]. Land use change implies the conversion of land use due to human intervention in various purposes such as agriculture, settlement, transportation, etc. [2]. While land cover change on the other hand, refers to modification of the existing land cover or complete conversion of a biophysical cover of the land to a new land cover type [3].

Human activities (growing food, cutting off trees, building cities, etc.) almost at all times involve the use of land which exerts tremendous effects on land cover (the physical characteristics of the land surface, including grain crops, trees, or concrete). Clearing of new lands, for whatever purpose has long been common in areas with rapidly growing populations [4,5]. It has variously been noted that land resources have been altered by rapid land use and cover changes accelerated by changeable socio-economic factors including high population growth, rapid urbanization, agricultural intensification and government policies [5]. Human pressure upon land resources and interactions between varying climatic characteristics facilitate changes in land use and cover [6].

Land use and land cover (LULC) change, as one of the main driving forces of global environmental change, is central to the sustainable development debate. Urban growth, particularly the expansion of residential and commercial land to rural areas at the periphery of metropolitan areas, have long been considered a sign of regional economic vitality but a very powerful agent of LULC change. Urban growth is known to exert enormously pressure on LU/LC through processes such as the removal of vegetation cover, replacement of existing vegetation types, reforestation and creation of hardened/paved/concrete surfaces. Such processes can cause some changes to the LU/LC with consequences to human survival. When towns develop, not only are lands taken for settlement development to accommodate more housing demands of urban dwellers, satellite towns also develop to meet with housing needs of those that serve the towns but are less capable of competing for houses in them. Thus, with the town and satellite down development, massive transformations in LU/LC are introduced which could no doubt have some serious consequences for global environmental change. To continue living in such changes, stakeholders in cities affected by the changes must as of necessity find means of adapting to them.

With advances in techniques for monitoring such changes (especially remote sensing and GIS technologies), a very large amount of research information is now available on nature, extent and consequences of urban development on LU/LC for many areas. A review of this has been presented elsewhere [3]. Most studies focused mainly on LULC changes, their drivers and their societal and biophysical impacts. To address the likely negative consequences that LULC changes may cause, it is quite appropriate to develop an understanding of how different stakeholders perceive them. Research on LULC change assessment hardly considers the views of stakeholders on especially the drivers of the changes. In most cases where such views were sought, farmers were the main ones consulted as they are typically considered the most notable actors on land and hence can be relied upon in gathering information on stakeholders' perspectives [3]. Unfortunately, other stakeholders like non-farm workers, as well as workers in public institutions and the private sector are largely neglected.

In the present study, a contribution is made to this regard by examining the perspectives of some key stakeholders on the drivers of LULC changes in Abuja Municipal Area Council, one of the fastest growing urban and regional areas in the world. The extent of such changes have been well documented elsewhere [3]. The aim of the study therefore is to analyze the perspectives of different landuse stakeholders on the drivers of LULC changes in Abuja Municipal Area Council of Abuja Federal Capital Territory.

2. Study Area

Abuja Federal Capital Territory (FCT) is located between latitudes 8°25"N and 9°25"N and longitudes 6°45"E and 7°45"E, covering a land area of about 8000 square kilometers. It was designated as the capital seat of Nigeria in 1976, with the country's government formally moved there in 1991. The master plan for the territory provides for a 250 km^2 capital city (FCC) to serve as the seat of the Federal Government of Nigeria, but with several satellite towns to support the teeming population the territory. Abuja FCT is divided into 6 political units, called Area Councils, which include Abaji, Bwari, Gwagwalada, Kwali, Kuje and Municipal Area Councils. The FCC is located within the Municipal Area Council, AMAC and this area council were deliberately chosen to serve as the testing ground for the kind of investigation intended in this study as most of the major public and private establishments in the FCT are located in the AMAC. This has particularly caused massive LULC changes in the area council. The nature of LULC changes that have resulted from these growth processes have been well documented [3] but no research information is available on the perspectives of different stakeholders on the drivers of such changes.

AMAC has a total of twelve wards, namely City Centre, Garki, Gui, Gwagwa, Gwarimpa, Jiwa, Karshi,

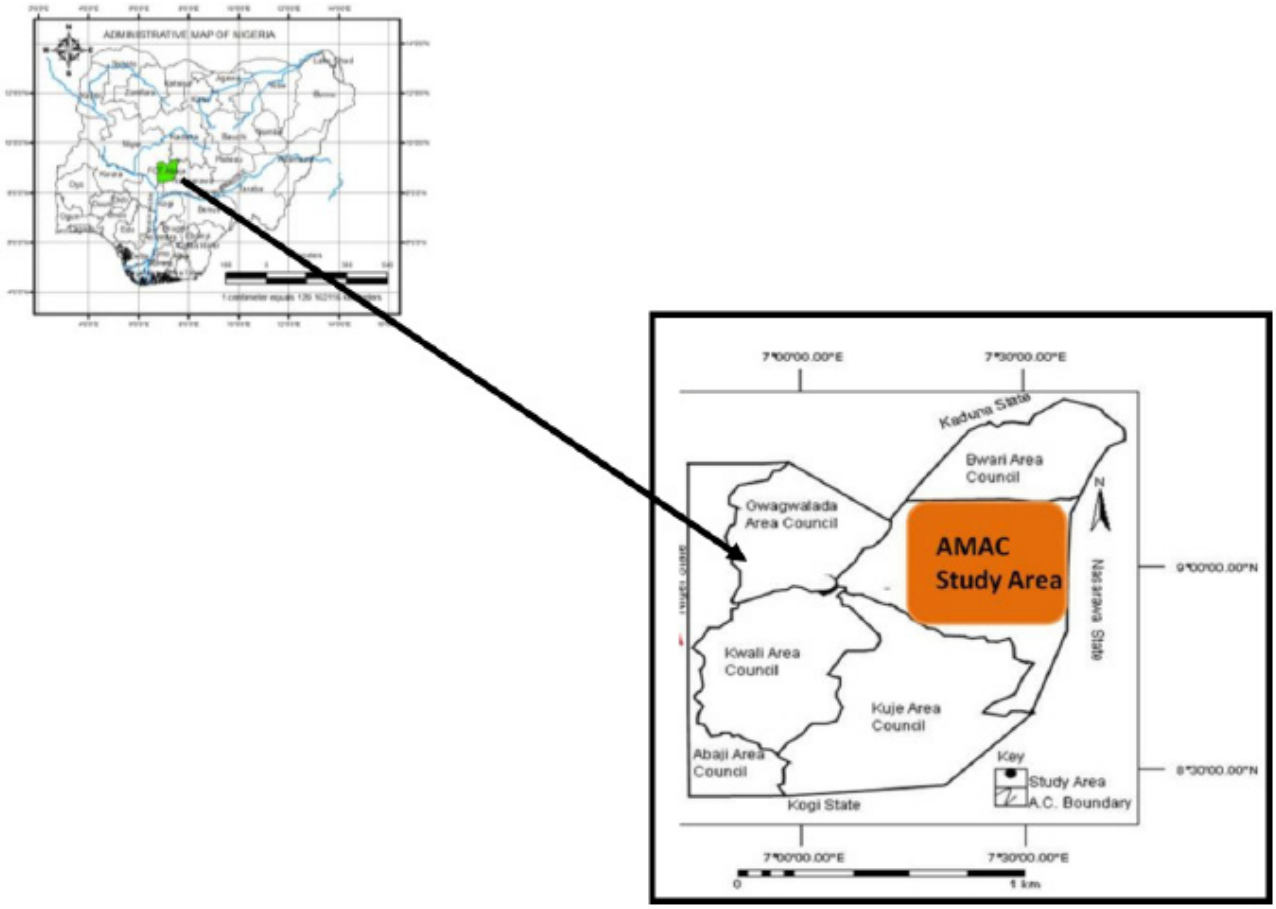

Figure 1. Location of Abuja Municipal Area Council (AMAC) in Abuja FCT, Nigeria

Kabusa, Karu, Nyanya, Orozo and Wuse, out of which four (Karshi, Karu, Nyanya and Orozo) which were identified as the most densely populated and the ones in which is the primary occupation of the majority of the dwellers have something to do directly with landuse/land cover were selected for this study.

3. Methodology

Data about the people's perception of the causes of LULC change in the study area were collected through the use of a questionnaire survey involving 514 selected households from the four selected wards, field observations, as well as focus group discussions with people that have been living in the study area for at least the past 30 years from the date of the study (2016). The 514 sample size was calculated from the data on household size of the four wards obtained from the Primary Health Care Department of AMAC. Distribution of the 514 households across the wards is shown in Table 1. The questionnaire utilised was designed to contain both closed and open-ended questions to enable the respondents to have the opportunity of expressing themselves very well on issues related to drivers of LULC changes. After completing the questionnaire the survey, the contents of the completed questionnaires were coded, summarized and exported into SPSS spreadsheet for statistical analysis to derive mean values and percentages of all the responses received through the questionnaires administered. Four sessions of Focus Group Discussions (FGDs) were held, one per each ward, with selected representatives of the various stakeholders. The motive of the FGDs was to provide a means of cross checking the individual responses received through the questionnaire survey.

Table 1. Distribution of Respondent by ward

Ward	Household Size	Calculated Sample
Karshi	10787	85
Nyanya	11805	117
Karu	28517	249
Orozo	2954	63

4. Results and Discussion

In this study, the causes/drivers of LULC change were identified into two categories as socio-economic or environmental, as this classification has been well discussed in the literature [6]. The responses received from the stakeholders on the influence of each of the categories are presented in Tables 2 and 3.

4.1 Socio-Economic Drivers of LULC Change

A close look at Table 2 reveals that there are some levels of variations between the stakeholders in two categories of settlements in the study area on the role of socio-economic drivers in causing LULC change. Demand for higher Income, population pressure increases and need for more housing developments were listed by the

Table 2. Responses Received on Socio-Economic Drivers of LULC Change

No. and % of Responses Received for the Various Wards								
	Karu		Nyanya		Karshi		Orozo	
	No.	%	No.	%	No.	%	No.	%
Demand for higher Income	93	37.4	103	88	63	74.1	53	84.1
Increased access to modern technology	12	4.82	19	16.2	6	7.06	3	4.76
More opportunities for Markets	23	9.24	17	14.5	16	18.8	9	14.3
Increase in access to land	78	31.3	98	86.2	23	27.1	19	30.2
Increase in access to labour	213	85.5	86	73.5	23	27.1	13	20.6
Increase in access to information	15	6.02	12	10.3	16	18.8	5	7.94
Absence of subsidies and credits	8	3.21	15	12.8	5	5.88	3	4.76
Government land policy for more development	206	82.7	95	81.2	32	37.7	21	33.3
Population pressure increase	197	79.1	102	87.2	72	84.7	61	96.8
More housing development	205	82.3	98	83.8	72	84.7	58	92.1
More commercial complex development	194	77.9	101	86.3	6	7.06	3	4.76
More institutional development	186	74.7	89	76.1	39	45.9	26	41.3
Increase in investments	89	35.7	18	29	17	20	24	38.1
Social unrest	8	3.21	15	12.8	5	5.88	3	4.76
Lack of alternative livelihood	21	8.43	46	39.3	68	80	61	96.8
Lack of information on best practices	9	3.61	13	11.1	7	8.24	3	4.76
Shortage of off-farm income-generating activities	11	4.42	27	23.1	75	88.2	58	92.1
Large dependence on natural resources	79	31.7	34	29.1	71	83.5	54	85.7
Lack of land ownership	31	12.5	19	16.2	6	7.06	3	4.76
Beliefs and values leading to more land usage	8	3.21	15	12.8	73	85.9	54	85.7
International trade	1	0.4	0	0	2	2.35	0	0
More Industrialisation	23	9. 24	13	11.1	4	4.71	0	0

Table 3. Responses Received on Environmental Drivers of LULC Change

No. and % of Responses Received for the Various Wards								
	Karu		Nyanya		Karshi		Orozo	
	No.	%	No.	%	No.	%	No.	%
Reduced rainfall	37	31.6	34	13.7	21	24.7	12	19.1
Increase in heat	14	12.2	19	7.63	6	7.06	3	4.76
Increase in incidence of Soil erosion	23	19.7	17	6.83	16	18.8	9	14.3
Agricultural expansion	43	36.8	21	8.43	65	76.5	52	82.5
Overgrazing	15	12.8	5	2.01	9	10.6	46	73
More Wood collection	45	38.5	64	25.7	69	81.2	57	90.5
More Medicinal plants collection	34	29.1	46	18.5	45	52.9	52	82.5
More Wild foods collection	42	35.9	28	11.2	67	78.8	48	76.2
Reduced river flow	23	19.7	17	6.83	16	18.8	9	14.3
Topographic condition	15	12.8	5	2.01	9	10.6	4	6.35
Pesticide and herbicides use	15	12.8	5	2.01	9	10.6	4	6.35
Bush burning	8	6.84	15	6.02	56	65.9	58	92.1
Livestock grazing	15	12.8	12	4.82	61	71.8	43	68.3
More logging activities	8	6.84	5	2.01	4	4.71	5	7.94
Windstorms	8	6.84	6	2.41	7	8.24	7	11.1
Flooding	23	19.7	19	7.63	6	7.06	3	4.76

majority (more than 80%) of the stakeholders across the four locations as the main drivers of LULC change. Those in urbanised settlements mentioned the government's emphasis in favour of more physical development on lands, more commercial complex development and more institutional development as the major drivers of LULC change. In Ethiopia, Meshesha *et al.* [7] have also observed that government's policy of deliberately promoting physical development has contributed largely towards promoting LULC change.

Those in predominantly rural locations indicated beliefs and values of the people leading to more land usage, shortage of off-farm income-generating activities and a lack of alternative livelihood as the major causative drivers of LULC change in the area.

Gbagyi people (one of the major tribes in central Nigeria) is known to hold the belief that ownership of land from where one can gather large quantities of fuelwood will not only increase one's chance of getting rich but will make one absolute control over the spirits that dwell in the forests [8]. With time however, as more lands were taken up for physical development, forest lands are lost leading to a loss of livelihoods. Also taking up of more cultivated lands will imply loss of off-farm livelihood activities especially those related to off-season processing and sale of farm produce. With that, the stakeholders are left with no option but to seek for other alternative livelihood sources which invariably will directly or indirectly lead to more pressure of LULC as the lands are the only option for survival of the rural dwellers. The fact that agriculture and deforestation contribute significantly to LULC change in particular and environmental degradation in general in sub-Saharan Africa has been well documented [9].

During the FGD sessions, it was established that due to loss of livelihoods, many of the rural stakeholders disposed of their lands as survival strategies while those with large holdings from where they used to obtain tree-based wild foods and fodder cleared and prepared them for cultivation, rental by others interested in crop production or sell them to those interested in acquiring lands for physical development.

Enedah *et al.* [10] have shown that though Abuja FCT was created in 1976, it was not until the physical development of both the city of Abuja and its region started in earnest with the provision of the large number of socio-economic infrastructures and developmental institutions through the activities of both the public and private sectors. With this followed a large influx of a large number of Nigerians of diverse ethnic origins into the FCT as employees in the public and private sectors, and as entrepreneurs in the informal sector [8]. As is typical with urbanisation process in sub-Saharan Africa [11,12], the provision of infrastructure in Abuja has been at an unprecedented pace in the country and to date nowhere else in the country has such development been replicated. This created the problem of urban primacy in the country and since the FCT is located at the centre of the country, the problem gave rise to a large influx of Nigerians from all parts of the country leading to massive rise in the human population [3]. To accommodate the ever expanding population, the government has been encouraging massive provision of infrastructure using both public and private funding sources. It is thus not surprising that the stakeholders irrespective of their location almost unanimously identified population pressure increase, demand for more income and housing (which are all products of provision of infrastructure) as among the major drivers of LULC change in the study area. However, as the infrastructure provider has not been evenly provided between rural and urban locations within the territory, it is to be expected that disparity will exist between rural and urban stakeholders in the perception of the extent to which such factors contribute to LULC change. In particular, the stakeholders in the predominantly rural locations comparatively have a lower perception of the role of infrastructure provision in causing LULC change than other stakeholders.

In Nigeria, ownership and use of all lands are defined by Landuse Decree of 1976, which vests power on the Government. Nigerians are only given the right of ownership through the issue of the right of occupancy for a period not exceeding 99 years. Thus, even though allocated lands are not 'permanently' owned by allottees, the fairly lengthy period of occupancy typically given (99 years) more or less make them have a feeling of permanency of ownership. It is sometimes argued that not vesting permanent and complete ownership of lands on the people will discourage them from conserving such lands [13]. In Ethiopia, studies have shown that the possession of all rural and urban lands by the state led to a lack of belongingness to natural resources by the individual farmers, which in turn triggered huge deforestation [14,15]. During discussions with key informants among the stakeholders, it was established that the people generally hold the belief that lands belonging to them whether allocated, purchased or borrowed/rented must be protected for the owner to ensure deriving benefits continuously from them. In sub-Saharan Africa, the fact that rural people' near total dependence on natural resources contribute much to LULC changes have been well recognised [15].

A majority (more than 60%) of the stakeholders across

the four study locations indicated that increased access to modern technology, more opportunities for markets, absence of subsidies and credits, increase in access to information, increase in investments, social unrest, lack of information on best practices, lack of land ownership, International trade and more industrialisation are not major socio-economic causative factors of LULC change in the area. During discussions with the stakeholders, it was however established that the coming of private sector in housing development processes in the study area have brought about a massive transformation of the urban landscape, especially in the two predominantly urbanised settlements of Karu and Nyanya. Also, it was found out that crisis resulting from social unrest in especially central and northeastern parts of the country over the last 5 to 10 years have contributed to a massive influx of people into the FCT. Thus, it was a bit erroneous that the majority of the respondents did not indicate an increase in investment and social unrest as major factors contributing to LULC change in the area.

In general, the stakeholders' perception of a population pressure and lack of alternative livelihoods as among the major socio-economic drivers of LULC change were in line with the findings of studies conducted in different parts of sub-Saharan Africa [7,13,16]. As the population grows, competition for available options increases leading to reduced opportunities for livelihood and consequently, alternative livelihoods become scarce. People thus have few options to diversity to other livelihoods options besides the limited ones available (especially exploitation of forest resources and cultivation of crops).

4.2 Environmental Drivers of LULC Change

The main environmental drivers of LULC change on which the perception of the stakeholders was sought are presented in Table 3. It could be seen from the table that majority (over 60%) of the stakeholders in the two predominantly urban settlements did not indicate environmental drivers as the major ones responsible for LULC change in the study area. In the predominantly rural settlements however indicated bush burning, livestock grazing/overgrazing, more wood collection, more medicinal plants collection and agricultural expansion as the major drivers.

Literature on environmental causative factors of LULC change in many areas of the world [5,6,14,17-26], has variously described climate change, agricultural expansion, bush burning, collection of timber and non-timber products as the major environmental drivers. It is obvious from the results obtained in this study that it is mainly the stakeholders in rural locations that have some good level of perception of the role of such environmental factors in causing LULC change perhaps they maintain comparatively stronger interactions with the environment than their urban dwellers' counterparts.

5. Conclusions

The results obtained showed clearly that there are clear differences between rural and urban stakeholders in the perceptions of some of the causes of LULC in the study area. While urban dwellers are largely aware of causes of changes in human aspects (physical development on lands, more commercial complex development and more institutional development) of LULC, and in fact majority (over 60%) of them did not indicate environmental drivers as the major ones responsible for LULC change in the study area. Their rural counterparts on the other hand are largely aware of the causes of changes in the physical aspects (beliefs and values of the people leading to more land usage, shortage of off-farm income-generating activities and lack of alternative livelihood, leading into bush burning, livestock overgrazing, more collections of wood and medicinal plants, and agricultural expansion) of LULC change. For programs aimed at responding effectively to negative effects of LULC change to be designed and implemented in the study area, there is the need to be about effective harmonisation of the level of perceptions and understanding of the change drivers of both the rural and urban dwellers so as to ensure that they develop a common underrating of the problem and how best to tackle it. In this regard, intensive use of environmental education and engagement of stakeholders in policy design and implementation towards responding effectively to LULC changes, are very much needed.

Declaration of Conflict of Interest

The authors declare that they have no individual relationships that could have performed to affected the work reported in this study and have no known conflict of financial interests.

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