

Urbanization And Environmental Condition In Greater Karu Urban Area, Nasarawa State, Nigeria

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Abstract: Settlements around the Federal Capital Territory (FCT), Abuja are urbanizing rapidly due to large influx of population from all parts of Nigeria and elsewhere. Greater Karu Urban Area (GKUA), a corridor of development to the FCT, has fast developed into a cosmopolitan area in less than forty years of the existence of the Federal Capital Territory. This research examined the effects of urbanization on environmental condition of settlements in GKUA. Questionnaire was employed to obtain attribute data from respondents on environmental sanitation while digital photographs taken captured the state of the environment during the survey. A survey of five settlements, was undertaken and high density residential areas with severe environmental issues were identified and purposefully selected for the study. Out of three hundred and five (305) questionnaires administered, 241 were returned completed and used for the study. Results show a rapid expansion and development of the settlements from 2.78% of built-up area in 1986 to 8.29% in 2009. The study also shows a proliferation of slums in the 5 young settlements characterized by insufficient basic infrastructure and services. Approximately 2/3rd of the respondents are living in poverty and about 44% in poor housing and environmental condition. The interplay of these factors pose a threat for future security of the residents in these settlements if planning interventions are not strategically put in place to check the development of slums.

Key Words: Urbanization, Environmental Condition, Greater Karu Urban Area (GKUA).

I. Introduction

Greater Karu Urban Area (GKUA), a corridor of development to the Federal Capital Territory (FCT), has fast developed into a cosmopolitan area in less than forty years of the existence of the Federal Capital Territory. GKUA which currently contains more than 2 million people, from 201,207 in 2006 and 127,022 in 1991 is a very young and recent planning area by Nigerian standard. Established and gazetted in March 2001 by the Nasarawa State Government as essential 'dormitory' settlements to FCT, GKUA had the mandate to provide accommodation for the increasing number of people, workers and employees in the FCT and elsewhere among other objectives.

Before the creation of the FCT in 1976, settlements in this area were dominated by small, sparse populated settlements with about 85% of the settlements having between 50-500 people, (Gaza, 1990 and Rikko, 2000). The creation of the FCT necessitated the relocation of settlements that were then within the federal capital territory. As a result, inhabitants of New Karu and New Nyanya were relocated from old Karu and old Nyanya through a resettlement scheme by the Committee for Resettlement Development Programme (CRDP) in 1981. The two settlements were planned basically for residential purpose with minimal facilities and services for the resettled population. Settlements such as Mararaba, Masaka, Kuchikau, Uke, Kodepe (Auta ba Laifi) and their hinterlands in the present planning area developed from smaller, nucleated village settlements. Studies have established that there was no major urban development in the area prior to the establishment of the Federal Capital, (Mabogunje and Abumere 1981; Jinadu, 2004; Rikko, 2000 and Rikko, et al., 2013). Several studies have also agreed that the establishment and relocation of the Federal Capital from Lagos to Abuja and the subsequent movement of establishments and parastatals in 1991 revolutionized the entire landscape and influenced rapid influx of population and urbanization leading to significant growth and expansion of the settlements which were in themselves unplanned and with very meagre resources (Yari et al, 2002; Vilo, 2012; Rikko and Laka, 2013).

A demographic survey conducted by the FCT and National Population Commission in 1993 confirms that the population of FCT was in the region of 409,000 before 1991, but rose significantly to about 700, 000 after the movement of Ministries, parastatals, departments and agencies to the capital city (National Population Commission, 1991). This resulted in overstretching the few existing facilities and influenced an increase in demand for housing, infrastructure and services which were insufficient and costly. Dung Gwom, (2013) asserts that Abuja was designed for the rich and powerful and nothing for the poor and disadvantaged. This was reflected in the pattern of housing allocation which mostly favoured senior civil servants and the high class in the society. More so, the cost of land and rent for residential accommodation has since been beyond the affordability of low and medium income workers. The situation is not different even today where the cost of land and rent are in hundreds of millions. These factors have continued to 'push' majority of workers to

neighbouring settlements in GKUA where the cost of living, housing and plots of land are not only available but are also relatively affordable.

GKUA provides residential accommodation to more than 60% of low and medium income workers in construction companies, labourers and service providers in the FCT and elsewhere (Zubairu and Yari, 2002, UN-HABITAT, 2012).

The designation of New Karu as the Local Government Headquarters of Karu Local Government Area in 1996, the establishment of institutions, industries, hospitality facilities, increase in economic and employment opportunities and access to land also influenced rapid urbanization and growth. As a result, GKUA has become a large cosmopolitan area and a melting point for all. These have accelerated rapid uncontrolled growth and development; creating inhuman and insecure urban landscapes (slums) at the gateway of the new capital city, Abuja with implications that are already overwhelming the local capacity to cope.

The objective of this paper is to examine the effects of rapid urbanization on environmental condition in the high density neighbourhoods of settlements in Greater Karu Urban Area (GKUA) and to draw attention to the potential security challenges that may arise from such landscapes if the trend is not properly addressed through planning and ensure a more sustainable development of settlements that conducive with friendly environments.

II. Urbanization In Developing Countries

There is an astonishing trend of population shifts from rural to urban in the last several decades bringing about very fast pace of urbanization in developing countries. The growth of towns and cities has generally been attributed to migration from rural areas and natural population growth. Urbanization is defining the manner in which population change from rural to urban. Thus, global population is projected to reach 10 billion by 2050, (IHDP, 2005) while world urban population is expected to increase to 57% by 2050 from 47% in 2000 (African Development Bank, 2012). More than 90% of this future population is expected to live in cities of developing countries (IHDP, 2005 and Alabi, 2009, ADB Report, 2012) where increasing proportion of urban population are already living an impoverished life in slums. Some projections have even indicated that between 2010 and 2025, some African cities will account for 85% of the population. Africa's urban population that stood at 36% in 2010 is projected to rise to 50% and 60% by 2030 and 2050 respectively (ADB Report, 2012).

While urbanization process in developed countries was the result of rapid industrialization, urbanization in most developing nations is a consequence of the "push" from the rural areas and the "pull" to the town (Aluko, 2010). Thus, greater number of people is moving to small number of rapidly expanding cities for the first time. This new "urban Millennium" or "tipping point" according to UN report (2007) is changing the fabric of life in both urban and rural areas in massive and unforeseen ways. In fact, the pace and scale of urbanization in developing countries is changing demographic landscapes with increasing pressures on available basic infrastructure and services. This has resulted in the creation of large urban slums, where more than one third of urban population is already living with complex and multifaceted challenges of poverty, sub-standard housing conditions, insecurity and poor environmental condition and without access to most basic services.

Rapid urbanization and urban growth are occurring at an accelerated and alarming rate in Nigeria due to the unprecedented influx of population into the urban centres. Urban population was observed to increase fivefold between 1952 and 1982 in most urban centres (Jinadu, 2004). Reports show that 50% of the population in Nigeria already lived in urban areas by 2010, and is predicted to host more than 60% by 2025 (World Gazetteer, 2005). Urban growth also rose from 5 percent in 1991 percent to 5.8 percent in 2004 (Federal Republic of Nigeria, 2004) almost the highest in the world. The phenomenon of urbanization in Nigeria has been seen as unique in scale, pervasiveness, and in historical antecedents. Nigerian urbanization has been a function of agglomeration of economic activities consequently, the spatial concentration of investments in urban centres and the rapid development of oil resources since 1970's have been seen as major factors that generated urbanization and its other economies and enhanced rapid growth and development of our urban centres. These old centres such as Lagos, Ibadan, Kano, Port Harcourt, and many young ones have continued to grow uncontrollably in uncertain patterns, with constraining pressure on public infrastructural facilities and services which are always in short supply.

Though urbanization is a natural part of development and in fact very desirable, the formidable challenges pose severe consequences on the environment. This is more so that the rate of urbanization has far exceeded the local institutional capacity and willingness to provide basic amenities such as water, electricity, and sanitation. In spite of the Millennium Development Goals 7th objectives to reduce by halve the proportion of the population without sustainable access to safe water and basic sanitation by 2015 and significantly improve the lives of 100 million slum dwellers by 2020, the review of the performance of MDG for Nigeria in 2013 for instance shows that access to water and sanitation has not improved significantly and that environmental challenges, such as erosion, coastal flooding and climatic change are rather increasing (example is the

devastating flood that engulfed almost the entire country in 2012) (MDG International Issues, 2013). Thus, more and more people living in the city are increasingly becoming impoverished and in inhuman conditions.

The Effects of Population growth on the Environment

Environmental problems are complex and their interactions are hard to define, unfortunately they are the list attended to in several countries. The most emerging environmental issues are climate change, freshwater scarcity, deforestation, fresh water pollution, grazing land, rapid population growth. However, rapid population growth has been established to be the major cause of environmental problems. Current world population which demographers assert is on average very young and has many years of reproductive life ahead suggests future population explosion which projections conclude more than 90 percent will be in developing countries. Already, there is a growing demand for food, water, housing, heat, energy, clothing and consumer goods which is also projected to increase in the future while arable land decreases with human activities (ENCARTA, 2001)

III. The Study Area

Greater Karu Urban Area is a 'Planning Area' established in 2001 by the Nasarawa State Government as a development corridor to the FCT due to its proximity to the FCT. The area lies between latitudes 8° 5"N and 9° 25"E and longitudes 7° 54"E and 10° 42"N east of the Greenwich Meridian. Located within the administrative area of Karu Local Government Area, it shares common boundaries with Old Nyanya and Old Karu in FCT, Abuja to the South west, Keffi Local Government Area of Nasarawa State to the south, and Jaba Local Government Area of Kaduna state to the north, (see, figures 1 and 2). It occupies an area of about 800sqkm (KAPDA Report, 2001). It covers approximately 20 kilometres from north to south and approximately 40 kilometres from the FCT boundary in Old Nyanya to Angwan Zakara along Abuja-Keffi high way. The major urban settlements in the planning area comprise of Mararaba, New Karu, New Nyanya, Masaka and Uke, while the rural areas that have also been overtaken by new urban development and engulfed by the larger ones include: Koroduma, One Man Village, Ado, Ado Kasa, Zhenwu, Luvu, Gurku, Kuchikau and Auta ba Laifi (Kodepe) among others.

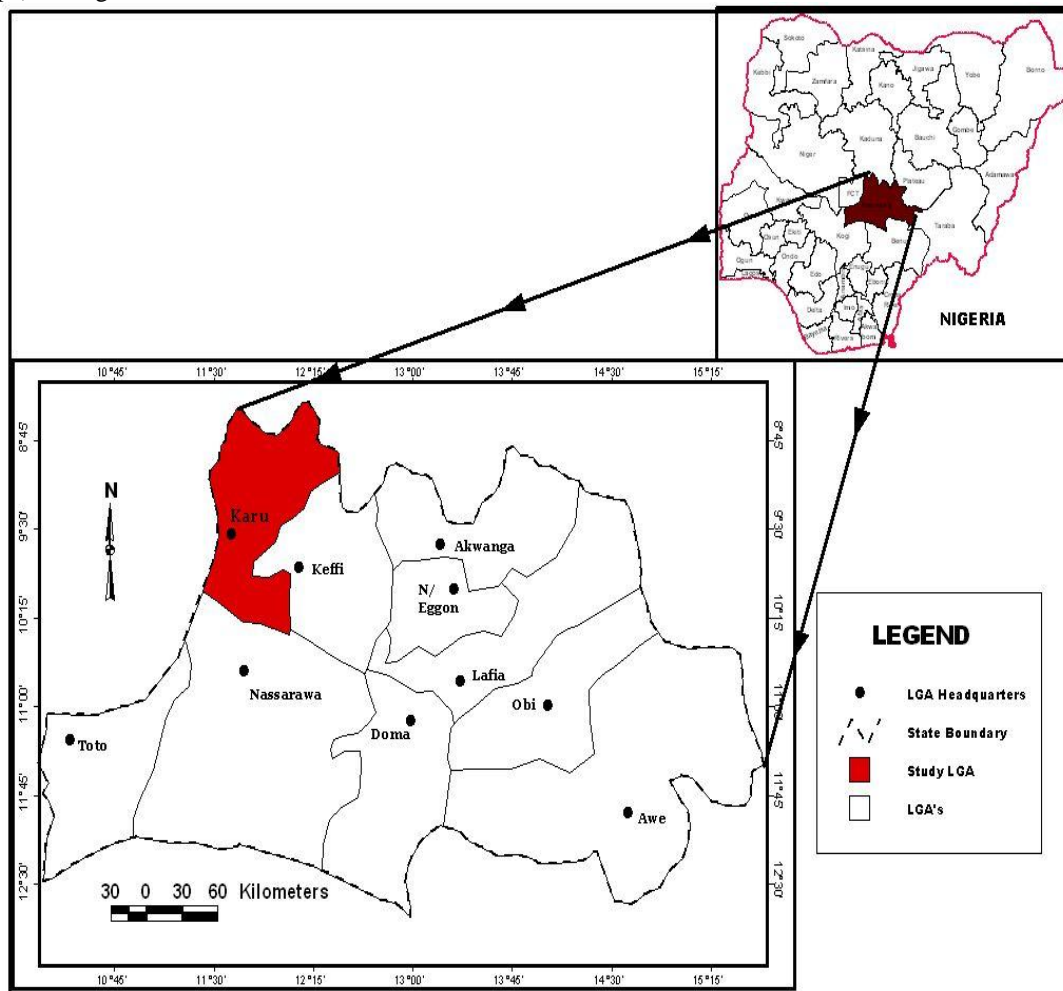


Fig 1: Nasarawa State showing Karu Local Government Area.

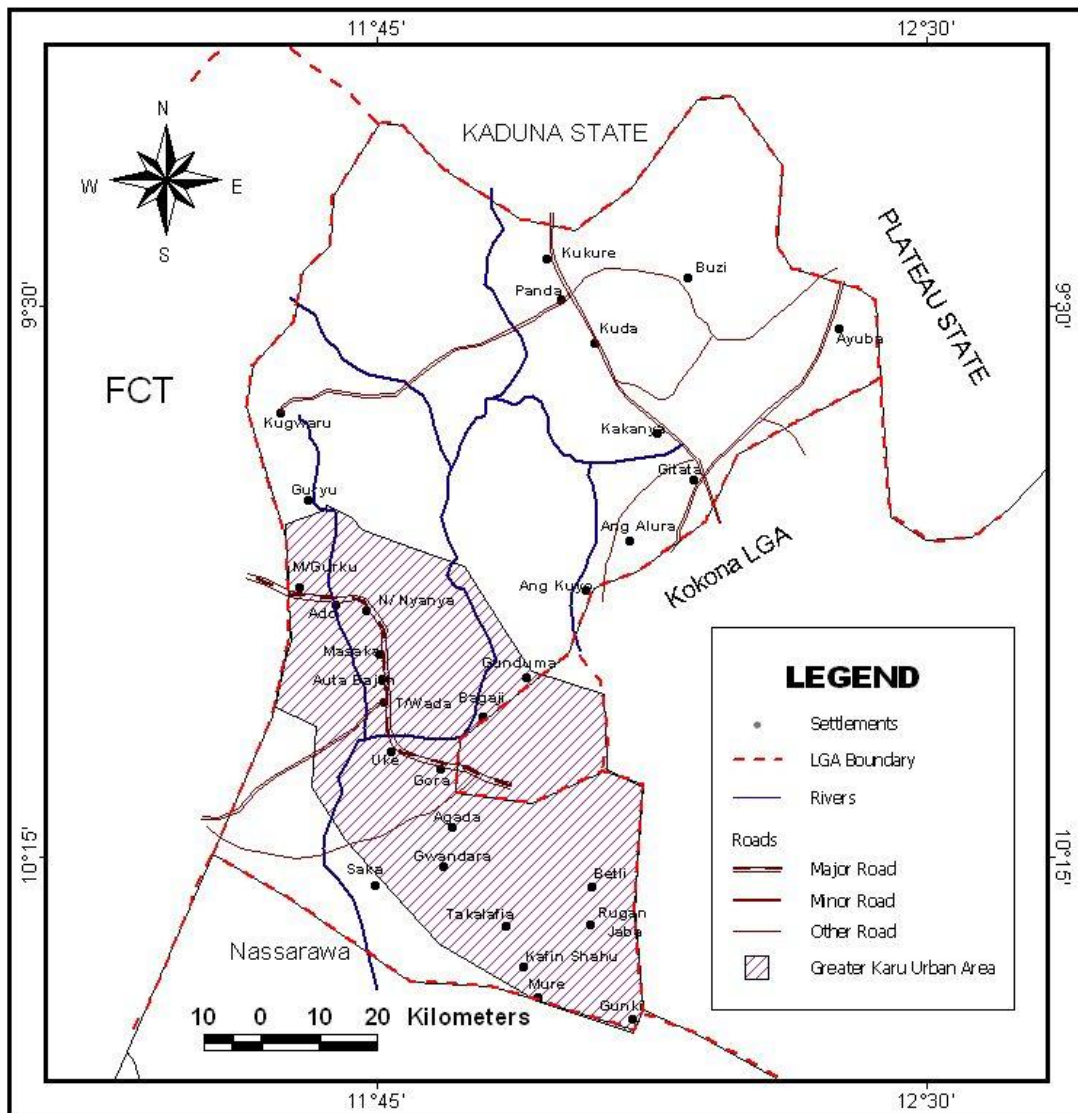


Fig 2: Karu LGA showing GKUA.

IV. Methodology

The study was achieved through a review of literature on urbanization and the environment, environmental condition, Nigerian urbanization, factors driving urbanization in Nigeria and their consequences were identified. Information on the nature of the settlements and residential housing neighbourhoods was obtained from a satellite image of Google Earth image of 2012 and confirmed by a field survey in 2013 where 55 neighbourhoods exhibiting slum characteristics already existed in the five young settlements of Mararaba, New Karu, New Nyanya Gwandara, Masaka and Kuchikau with the highest number of 24 neighbourhoods in Mararaba and Kuchikau with the least of 3. From 55 neighbourhoods, six (6) were randomly selected with two (2) neighbourhoods from Mararaba and one (1) each from the other settlements. With an average number of 509 housing units counted per neighbourhood and a total of 3054 housing units for 6 neighbourhoods, a 10% sample of housing units (306) was selected for the study. 306 copies of questionnaire were then administered to respondents living in the sampled neighbourhoods. Due to the density of the housing population counted per neighbourhood, the study categorized them as high density areas.

Despite the scattered and unplanned nature of housing development and the unavailable (nonexistent) street maps and addresses, the image facilitated the adoption of systematic and simple random sampling of the housing units for questionnaire administration. Out of three hundred and six (306) questionnaires administered, two hundred and forty one (241) were returned completed and used for the study (Table 1).

Table 1: The Study Settlements and Sampled Neighbourhoods

Settlement	No of Neighbourhoods	No. of questionnaires Administered	No. of Questionnaires Returned	Percentage
Mararaba	2	102	67	27.8
Karu	1	51	51	21.2
Nyanya Gwandara	1	51	50	20.7
Masaka	1	51	34	14.1
Kuchikau	1	51	39	16.2
Total	6	306	241	100

Source: Field Survey, September, 2013

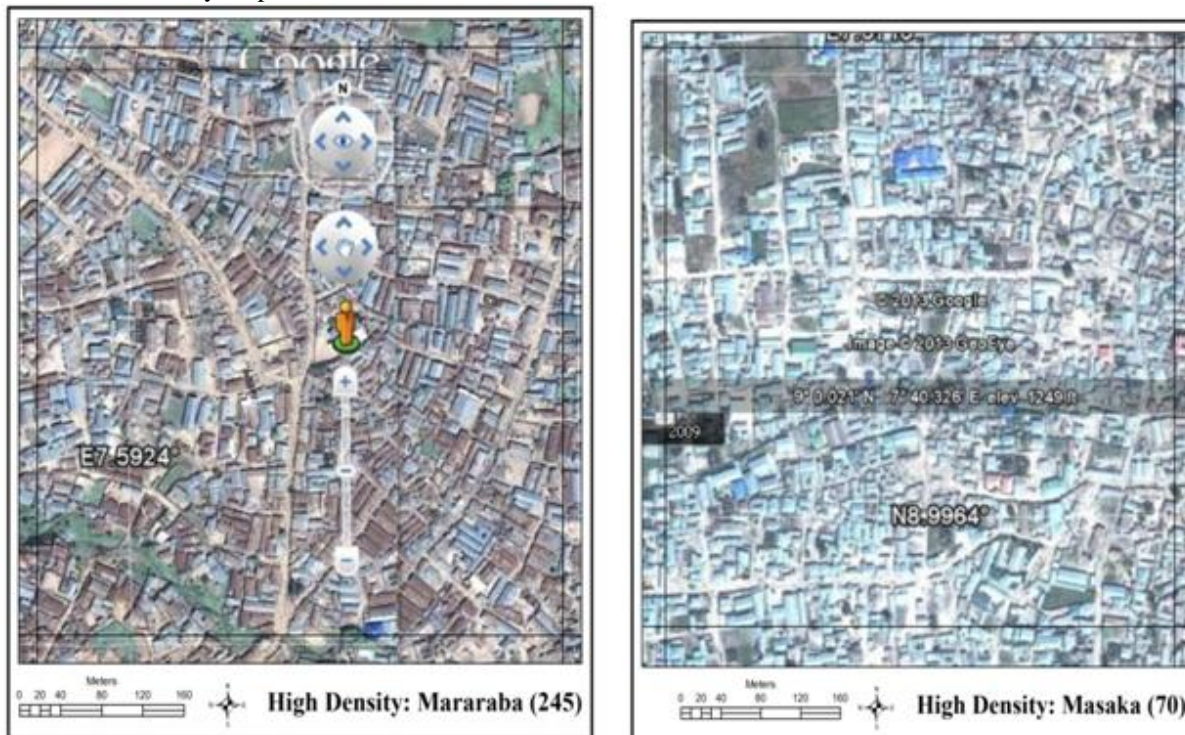


Fig. 3 Selected Neighbourhoods in Mararaba and Masaka

V. Discussions Of Results

5.1 Environmental Effects of Urbanization on the Settlements

The rapidly growing population and urbanization have influenced the rapid physical and environmental problems in all the settlements. These are in turn transforming the relatively young area into a large mega-slum with their attendant challenges in physical planning, housing and environmental condition.

5.1.1 Physical Planning

Attempts made by the government of Nasarawa State and international bodies to guide the development of land uses through planning have not achieved much positive success. Some of the efforts included plans prepared by:

- UN-HABITAT Karu Development Strategy prepared by Yari et al, (2002) for UN-HABITAT
- World Bank assisted Urban Upgrading Project between 2003-2012
- UN-HABITAT strategic plan for slum upgrading programme among others.

The non implementation of the strategic plans, current land acquisition practices, poor attitude of land owners and developers as well as urban managers have influenced and promoted to a large extent the uncoordinated and uncontrolled construction of buildings, haphazard expansion and growth of settlements without planning and provision of necessary infrastructure. The rapid rate of illegal development of land uses has already overwhelmed the capacity of the few professional planners and the planning authorities to cope with implementation of any planning measures. As a result, several neighbourhoods have already developed into slums as a result of the large population living in these areas and the pressure mounted on the few existing facilities which are inadequate and already in poor and deplorable state. With approximately 2/3rd of the respondents earning incomes between N18, 000 to N50, 000 monthly, 18% less than N10, 000 and only about 5% earning above N50, 000 monthly, suggests that majority of the residents are poor and live below the poverty

line of less than \$1 per day. This is reflected in the type of housing environments they live in as income is a major determinant of housing affordability. Close to half of the respondents (44%) live in poor housing and environments that are not conducive for human habitation (Plate 1), about 17% live in a fair housing environment while only about 11% indicated that they live in good housing environment. The study found that as high as 36% of the respondents live in rented accommodation with an occupancy ratio as high as 3.2 persons per habitable room. In make shifts tents such as seen in plate 1, living conditions are worse with more people squatting and without any sanitary facilities. These account for close to 12 while 30% of the respondents live in their own houses of 2 or 3 bedroom bungalows, 10% live in family compounds and about 8% live in quarters belonging to private companies/organisations.



Plate 1: Poor Housing and Environmental Condition in Mararaba

5.1.2 Water Supply and Sanitation

Water and sanitation issues are keys to the health and development of communities in GKUA. Regardless of the groundwater potential reflected in the number of boreholes and hand-dug wells in addition to the large earth dam in Nyanya Gwandara abandoned over the years, water supply is a major challenge in all the settlements. Six main sources of water were identified as contained on Table 3.

Table 3: Sources of Water in GKUA

Sources of Water	Mararaba	%	New Karu	%	Nyanya Gwandara	%	Masaka	%	Kuchi kau	%	Total	%
Hand-dug-Well	37	7.9	38	8.1	32	6.8	24	5.1	28	5.9	159	33.8
Private Borehole	41	8.7	36	7.6	28	5.9	40	8.4	29	6.2	174	36.9
Itinery Vendors (purchase)	46	9.8	34	7.2	31	6.6	38	8.1	22	4.7	171	36.3
Dam					7	1.5					7	1.5
Stream/River	9	1.9	2	0.4	4	0.8	3	0.6			16	3.4
Others											4	0.8
Total											471	100

Source: Field Survey, 2013

Note: Values are not mutually exclusive

Despite the large population and the rapid rate of development of housing and economic activities requiring the use of water in the area, there is no pipe borne water in any of the settlements. As a result, residents provide water through private self-efforts. Due to inadequacies in supply experienced particularly during the dry season, residents depend on more than one source for water supply. More than two-third of the residents indicated that private borehole is the major source of water both for domestic and commercial purpose. More than 36% indicated that it is the main source of water for itinery vendors. Hand-dug well contributes close to 34% while less than 1% depends on rain water during the rainy season. The cost of access to water for

domestic use is enormous. Centre on Housing Rights and Evictions (COHRE), (2008) report that people living in slums tend to pay more for water and other services than the more affluent neighbourhoods. They study found that more than one-third of the residents spend close to N150/day/average family of 6 while larger families spend close to N200 for domestic purpose (between N4,000-N6,000 monthly). Residents purchase sachet or bottled water for consumption due to the uncertainty of the quality of water, containers used for transport and personal hygiene of the vendors while the poor consume from available sources. This affirms the findings of Onabolu et al, (2011) who reported that 37% of the population in sub-Sahara Africa still relies on unimproved sources of water. Lack of safe drinking water supply as well as poor sanitation ranging from mortality, morbidity and poverty have been reported in literature as consequences (Akpabio, 2012; Nwankwoala, 2011 and WHO, 2010)

The absence of public sanitation and sewage treatment facilities in GKUA creates room for households to employ various means to meet their needs. Some of the methods identified by this study included: the use of open spaces/bushes/farmlands for defecation, pit latrines and water based disposal systems for human waste disposal as confirmed by Akpabio, (2012). More than one-third of the respondents indicated that they share the use of pit latrines, close 25 % use water closet (shared) and 16% exclusive while more than 8% signified that they do not have any toilet facility and therefore use available open spaces for defecation. The study also found that close to 80% of the neighbourhoods do not have drainage networks. From the less than 20% of the respondents that indicated availability of drainages, more than 71% were in poor condition, 15% were fair while only 9% were in good condition and 5% were very good. Drainage system in the area has been based mostly on the natural pattern as determined by the slope (Yari et al. 2002), as a result, liquid waste and runoff water are channelled into nearby water bodies through the roads and streets. Mararaba, Nyanya Gwandara and Masaka experience worse conditions of floods during the rains as a result of blockages of the available drainages by refuse/waste. These are usually washed into the water bodies by runoff water thereby further polluting and contaminating the water quality for consumers downstream.

5.1.3 Solid Waste Management

Although this study does not provide information on the volume of solid waste generated in the area, the prevalence of the heaps of solid waste/refuse dump sites that proliferate the neighbourhoods suggest that collection has overwhelmed the capacity of the local authorities to efficiently cope with the evacuation and management. Particularly in more densely built-up areas of Mararaba, Masaka and Karu and commercial areas, large volumes of accumulated wastes/refuse in some locations suggests that collection does not exist (Plates 3a and b). It may seem that the average generation rate of 0.4 kg/capita/day for Nigerian urban areas will be surpassed in GKUA. This confirms the findings of Ogu, (2000) who reported that in West Africa; only 10% of solid waste collected is concentrated leaving some parts of the city un-served. Table 4 presents various wastes/refuse disposal and management practices in GKUA since 2002 till date as updated by this study. This suggests that the disposal methods have not been improved upon despite the increase in the volume generated. Some residents attribute inefficient management of waste to large population, higher consumption rates, rapid expansion of the settlements, poor road network, inadequate collection vehicles, delay and poor collection system and inadequate manpower.

Poor waste management affect environmental quality, encourage the release of hazardous and toxic chemicals, spread of viruses and bacteria which affect human health and spread air borne diseases. Waste dump sites are usually breeding grounds for rodents and pests such as, rats, cockroaches, mice, snakes, and mosquitoes. Poor quality environments affect the water quality, value of property, visual aesthetics property and the city. More worrisome is the fact that most of the uncollected wastes often cover the roads and make them impassable and are sometimes washed into the water bodies during rainy season (Plate 3a and b), thus, polluting ground and surface water through leaching and seepage. This is very harmful particularly for villages downstream that rely almost 100% on water from these rivers/streams for domestic use and consumption as noted earlier.

Table 4: Summary of Solid waste Management Systems in GKUA

	Generation and composition	Collection and disposal practices
1	HOUSEHOLD-Domestic Wastes: ash, paper, plastics, glass, vegetable matter, sachet water and polythenes	Transport to bushes , burning, disposed at refuse dumps, indiscriminate disposal in drains, water bodies, undeveloped plots, uncompleted and between buildings, open spaces and along access roads
2	COMMERCIAL AREAS: including Markets and Abattoir: paper, ash, wood, and metal scraps, vegetables matter	Storage around premises, burning, indiscriminate disposal on access roads, high way and water bodies
3	LIGHT INDUSTRIAL ACTIVITY: wood and metal scrap	Stored or discarded around premises
4	INSTITUTIONS: paper and plastics	Storage around premises, burning
5	HOSPITALS: hospital wastes	Burning and burying within premises

Source: Karu Cities Alliance Initiative, 2002 and updated



Plate 3: Waste disposal (a) along an access road in Karu (b) beside a secondary school in Masaka

5.1.4 Traffic Congestion and Pollution

The explosive growth in the number and volume of vehicular use is one of the major environmental challenges in the area. The Keffi-Abuja High Way is the main arterial route and serves as a major regional high way linking the FCT with the eastern part of the country. It is a major factor in driving the growth and development of GKUA. Though constructed to serve as a thorough fare, several commercial activities and other uses have encroached on both sides. As a result, it attracts heavy flow of traffic at the peak hours of the morning between 5am to 9am and in the evening between 3pm and 9pm reflecting patterns of journey to work to and from FCT (Table 4).

The volume of traffic on the road is beyond the capacity of the road as reflected by the acute delays in traffic during the peak hours, chaos and frequent vehicle accidents. A traffic survey conducted on Wednesday 19th March 2014 at Mararaba boundary with FCT between 7am and 8pm give the total volume of traffic entering into Abuja as 31, 042 classified into Cars-28,390; Buses-1,968 and Trucks-684. The implications are reflected on increases in the use of fossil fuel thereby increasing green house gas emissions, human health, air, water and environmental pollution, respiratory diseases such as asthma, bronchitis, and even death. Studies have shown that disease rate rises when the air pollution level increases (HABITAT, 1996). Furthermore, heavy traffic congestions increase stress and stirs up stress related illnesses in motorists, delays and loss of work hours, loss of family relationship and wear and tear of vehicles among others.

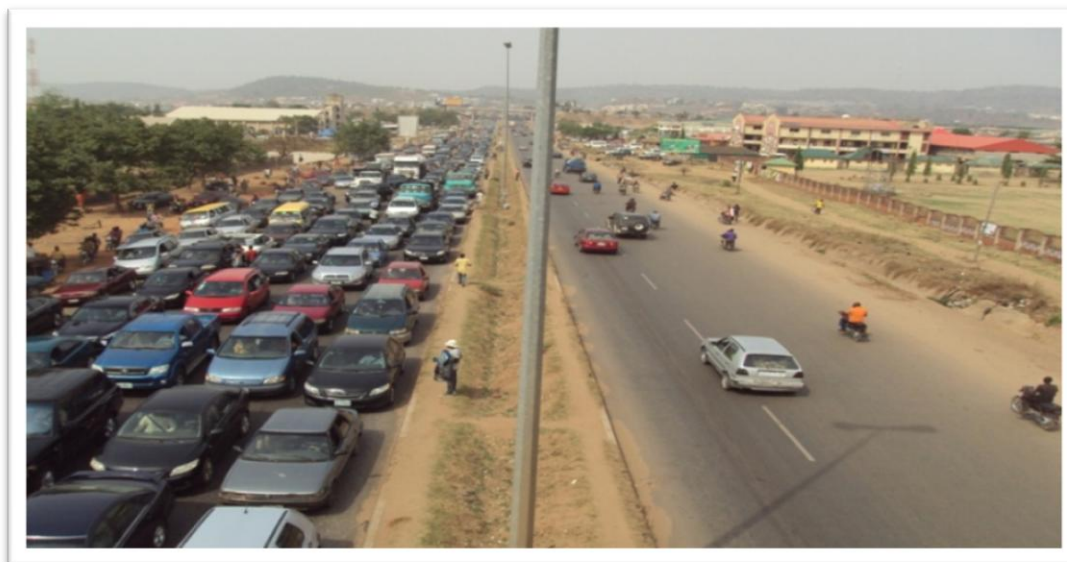


Plate 4: Traffic Hold up in Mararaba between 4pm-5pm

5.2. Urbanization, Environmental Condition and Security

Urbanization has always been portrayed as a social ill by researchers. This is basically because it is associated with the proliferation of urban slums. According to Sanchez-Leon, (1992) slums are hide outs for drop outs, criminals and hoodlums where a large part of the population, particularly children and young people live in poverty, chaos, urban violence, high unemployed youths who live along side criminals, drug addicts and who may at any time fall into similar treats. These conditions are prevalent in the slum areas of Nigeria in addition to poor housing conditions, poor access to water and sanitation, inadequate social amenities and infrastructure, livelihood system as established by this research. Early writers like Hosbawn, (1967) asserted that slum dwellers in Latin America had the potentials to revolt, riot, or even overthrow government. In Nigeria where urban violence has occurred recently and Jos in particular, the youths have been used in large number to destroy and burn properties. Dung Gwom and Rikko, (2009) in their paper on “urban Violence and Emerging Land and Housing Market in Jos, revealed that Youths in Jos were used to burn tyres, causing mayhem, destruction of lives and property in the several crises in the city. The paper also showed that all the areas affected by the violence were the slum areas of the city where majority of these youths live as asserted by Hosbawn. Though GKUA has not experienced any physical violence yet, the 55 existing slums areas identified by this study already in less than 40 years of the existence of GKUA creates room for fear for the future. Such areas are already considered breeding grounds for people of violent traits and potential trouble spots, prone to violence.

VI. Conclusions

Rapid and uncontrolled urbanization and growth of settlements in GKUA are occurring at a very fast and un-sustained manner without a commensurate growth in the rate of provision of infrastructural amenities and social services. The result is reflected in the rapid deterioration of the environment into slums and squalors with their attendant challenges. Thus, the nation’s new capital Abuja is developing side by side rundown neighbourhoods and slums in GKUA.

VII. Recommendations

1. There is an immediate need for a vigorous upgrading of the slum areas to improve the living condition in such areas which are very prone to violence. This can be achieved through Public Private Partnership and community participation.
2. A comprehensive plan for the entire Planning Area is required to guide and manage the growth and development GKUA. In addition to the need for new management approaches/strategies.
3. Provision of urban infrastructure in all the settlements in GKUA is very important. This can be achieved through the participation of all the stake holders; Nasarawa State government, FCDA, Local Government, NGOs, FBOs, private and public sectors
4. Legislate a bi-weekly environmental sanitation programme for the whole Local Government Area in order to improve environmental sanitary condition.
5. Some joined-up structure/organization in the like of the Lagos Mega-City Commission should be established to hold in the FCDA and adjoining states of Nasarawa, Kogi, Niger (and possibly Plateau and Kaduna) to address supra-FCT issues and problems such as population influx, service needs, environmental quality and insecurity.

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