



VOLUME 11 ISSUE 1

The International Journal of the

Constructed Environment

Urban Sprawl and the Challenges of Physical Development Planning in the North-Central Part of Nigeria

ASIMIYU MOHAMMED JUNAI, MAIMUNA ORIRE ABDULRAHEEM, AND BAMIRI MICHAEL ADELEYE

EDITOR

Cidália Ferreira Silva, University of Minho, Portugal

ACTING DIRECTOR OF PUBLISHING

Jeremy Boehme, Common Ground Research Networks, USA

EDITORIAL ASSISTANT

Megan Donnan, Common Ground Research Networks, USA

ADVISORY BOARD

The Constructed Environment Research Network recognizes the contribution of many in the evolution of the Research Network. The principal role of the Advisory Board has been, and is, to drive the overall intellectual direction of the Research Network. A full list of members can be found at <https://constructedenvironment.com/about/advisory-board>.

PEER REVIEW

Articles published in *The International Journal of the Constructed Environment* are peer reviewed using a two-way anonymous peer review model. Reviewers are active participants of the Constructed Environment Research Network or a thematically related Research Network. The publisher, editors, reviewers, and authors all agree upon the following standards of expected ethical behavior, which are based on the Committee on Publication Ethics (COPE) Core Practices. More information can be found at: <https://constructedenvironment.com/model>.

ARTICLE SUBMISSION

The International Journal of the Constructed Environment publishes quarterly (March, June, September, December). To find out more about the submission process, please visit <https://constructedenvironment.com/journals/call-for-articles>.

ABSTRACTING AND INDEXING

For a full list of databases in which this journal is indexed, please visit <https://constructedenvironment.com/journals>.

RESEARCH NETWORK MEMBERSHIP

Authors in *The International Journal of the Constructed Environment* are members of the Constructed Environment Research Network or a thematically related Research Network. Members receive access to journal content. To find out more, visit <https://constructedenvironment.com/about/become-a-member>.

SUBSCRIPTIONS

The International Journal of the Constructed Environment is available in electronic and print formats. Subscribe to gain access to content from the current year and the entire backlist. Contact us at cgscholar.com/cg_support.

ORDERING

Single articles and issues are available from the journal bookstore at <https://cgscholar.com/bookstore>.

HYBRID OPEN ACCESS

The International Journal of the Constructed Environment is Hybrid Open Access, meaning authors can choose to make their articles open access. This allows their work to reach an even wider audience, broadening the dissemination of their research. To find out more, please visit <https://constructedenvironment.com/journals/hybrid-open-access>.

DISCLAIMER

The authors, editors, and publisher will not accept any legal responsibility for any errors or omissions that may have been made in this publication. The publisher makes no warranty, express or implied, with respect to the material contained herein.

THE INTERNATIONAL JOURNAL OF THE CONSTRUCTED ENVIRONMENT

<https://constructedenvironment.com>

ISSN: 2154-8587 (Print)

ISSN: 2154-8595 (Online)

<https://doi.org/10.18848/2154-8587/CGP> (Journal)

First published by Common Ground Research Networks in 2020
University of Illinois Research Park
2001 South First Street, Suite 202
Champaign, IL 61820 USA
Ph: +1-217-328-0405
<https://cgnetworks.org>

The International Journal of the Constructed Environment is a peer-reviewed, scholarly journal.

COPYRIGHT

© 2020 (individual papers), the author(s)

© 2020 (selection and editorial matter),

Common Ground Research Networks

All rights reserved. Apart from fair dealing for the purposes of study, research, criticism, or review, as permitted under the applicable copyright legislation, no part of this work may be reproduced by any process without written permission from the publisher. For permissions and other inquiries, please contact cgscholar.com/cg_support.



Common Ground Research Networks, a member of Crossref

Urban Sprawl and the Challenges of Physical Development Planning in the North-Central Part of Nigeria

Asimiyu Mohammed Junaid,¹ Federal University of Technology Minna, Nigeria
Maimuna Orire Abdulraheem, University of Ilorin, Nigeria
Bamiji Michael Adeleye, Federal University of Technology Minna, Nigeria

Abstract: The world is witnessing a rapid rate of urbanization and Nigeria is one of the rapidly urbanizing nations of Africa. This study examined the problem of urban sprawl in Nigeria with particular reference to the Yanyan–Mararaba–Masaka road corridor along the Abuja–Keffi highway in the North Central part of Nigeria. The research monitored urban sprawl in the area using the Enhanced Thematic Mapper (ETM+) images of 2002, 2007, 2012 and 2017. The study revealed a high rate of physical development in the area with an annual growth rate of 15.3 percent within the 2007–2012 period. The built-up area increased from 31.07 km² to 54.50 km² representing 76.38 percent magnitude of growth in five years. The nature of sprawl development in the area featured both dense/compact developments in the growth corridor along the Abuja–Keffi road as well as dispersed, leap frogging developments in the far hinterland of the road. The negative effects of the sprawl development include flood plain occupation, poor waste management, poor environmental conditions, and slum development. Amongst others, the study recommended proactive urban planning, urban renewal, and the establishment of an autonomous joint physical planning taskforce to manage the sprawl so as to achieve orderly and inclusive urban growth in the area.

Keywords: Nigeria, Planning, Sprawl, Urban and Urbanization

Introduction

The world is witnessing a rapid rate of urbanization as 54 percent of the world's people lived in cities in 2014 and this proportion is expected to increase to 66 percent by 2050 (United Nations 2014). Nigeria is one of the rapidly urbanizing nations of Africa with a percentage of urban population higher than the sub-Saharan African average of 37 percent. In 1921, the population of Nigeria was only 18.72 million. This rose to 30.4 million in 1952, 55.67 million in 1963, and 80.5 million in 1991 (Onibokun and Faniran 1995, 5). According to the World Bank, around 85 million Nigerians, approximately half of the total population, were living in urban settlements in 2016 and the number of people living in towns and cities is expected to reach 295 million by 2050 (2016).

The rapid rate of urbanization has contributed to the tremendous growth of human settlements across the globe. Urban sprawl is becoming a major feature in most developing countries (Nnaemeka-Okeke 2016). Nigeria is experiencing an accelerated shift of population from the rural to urban settlements and several towns and cities are growing rapidly across the nation. The rapid urban expansion, driven by population growth, has led to the emergence and increase in the number of large and medium sized settlements in Nigeria. Currently, there are four population clusters with massive urban spatial development that define the Nigerian urban system (Bloch et al. 2015). These are the Northern, South-Western, South-Eastern, and the Central spatial conurbations. These four major population clusters host a number of urban settlements in Nigeria, and today, the Nigerian urban system is composed of one megacity (Lagos), seven metropolitan areas with a population over 1 million, fifteen large cities with

¹ Corresponding Author: Asimiyu Mohammed Junaid, Department of Urban and Regional Planning, Federal University of Technology Minna, Niger State, P.M.B. 65, Nigeria. Email: jinaduola@futminna.edu.ng

populations between 500,000 and 1 million, nineteen medium-sized cities with populations between 300,000 and 500,000, and a network of hundreds of smaller towns (World Bank 2016).

The phenomenon of rapid urbanization has brought about urban sprawl in many parts of the world. The rapid expansion has led to urban and suburban sprawl in many countries (Avis 2019). In North-Central Nigeria, the emerging spatial conurbation in the Yanyan–Mararaba–Masaka axis along the Abuja–Keffi highway is witnessing a high rate of urban growth leading to sprawl development. Rapid rate of urbanization and uncontrolled population growth in the Greater Karu Urban Area (GKUA) adjacent the Federal Capital Territory (FCT) of Nigeria has witnessed accelerated land consumption and haphazard urban development in the recent years (Rikko and Laka 2013). This study is focused on the problems of urban sprawl in North-Central Nigeria. The objective is to examine the rate of sprawl development and the challenges of physical development planning with a view to proffering ameliorative measures.

Urban Sprawl: Concept, Causes, and Effects

The definition and conception of urban settlement vary across disciplines and international boundaries. Generally, urban settlements are defined as “demographically large, densely populated built-up areas” (Bloch et al. 2015, 5). However, there are no universal standards for defining an urban area as different countries use a variety of criteria to determine urban settlement. In most cases, the criteria for defining urban settlement include administrative status, density of physical development, and population size. In many countries of the world, urban settlement is defined by population size and in Nigeria, settlements with a population of 20,000 and above are classified as urban.

The phenomenon of urban sprawl is conceptualized as rapid growth and spreading of physical developments in urban settlements. Sprawl is the occupation and spread of land uses, most especially residential uses, on undeveloped, peripheral land of towns and cities. Urban sprawl usually occurs out-side of the center of services and available jobs and one of its principal indicators is the creation of large urban gaps which brings about the decentralization of public lands (Polidoro, Augusto de Lollo, and Fernandes Barros 2012). Sprawl is synonymous with unplanned, incremental development characterized by low density mix of land uses at the peripheral areas of urban settlements (Ujoh, Kwabe, and Ifatimehin 2010). The issue of rapid growth is a key feature of urban sprawl. Hence, Etim defined urban sprawl as the rapid expansion of urban development such as houses, shopping centers, industries, and offices away from the central urban areas into low-density, undeveloped land near a city, and usually car-dependent communities in a process called suburbanization (2018). Sprawl describes a scenario in which the rural hinterlands of settlements are colonized by new developments. Thus, it is a condition whereby, large structures (large number of houses, schools, companies, industries, stores. etc.) are established in an area around the city that initially had none or few people living in it (Etim 2018).

Several causes of urban sprawl have been advanced in the literature. First, the forces of sprawl are generated by rapid urbanization and population increases in cities. As more and more people aggregate in urban centers, the desire and demand for housing and basic infrastructure propel physical development. Beyond this social factor of urban sprawl, economic indices such as increased affluence, attractive land and housing prices, and the desire for larger homes with more amenities (Rafferty n.d) have been identified to play significant roles in sprawl development at the level of the individual. Other factors of urban sprawl, which are well documented in the literature, include growth in economic activities, availability of cheap land and houses at the city periphery, weak urban planning and development control, improved infrastructure such as extension of road and electricity to the city periphery, amongst others (Etim 2018; Rafferty n.d; and Avis 2019).

The phenomenon of urban sprawl is associated with a number of positive and negative outcomes. One of the positive effects of sprawl is economic boom as residential houses,

infrastructure, and businesses are established. These activities generate income for people and revenue for the government. Also, urban sprawl brings about the benefits of globalization and large economies of scale which can lead to economic development in affected towns and cities. In addition to these, low density sprawl development reduces the level of congestion in cities and this has some health benefits for urban residents.

In spite of these benefits, analysts agreed that urban sprawl produces more negative effects. As discussed in the literature, there are four major areas of environmental impacts attributed to urban sprawl—air, energy, land, and water (Wilson and Chakraborty 2013). Sprawl development brings about loss of environmental resources (loss of vegetation, natural habitats and biodiversity) as the land is cleared for construction purposes. The loss of environmental resources could lead to degradation, climate change and the risk of disasters in the affected areas. Urban sprawl is also associated with commuting problem which contributes to traffic congestion and air pollution (Avis 2019). Hence, high density sprawl development, lacking in proper planning, is often characterized by poor accessibility, traffic chaos, poor and unsanitary living environment.

Economically, sprawl development is costly and unsustainable as the costs of infrastructure provision, expansion, and maintenance are huge, most especially in areas with low density, leap-frogging development. In economic terms, loss of agricultural land could result in revenue loss and food insecurity in the long run. The social costs of urban sprawl are manifested in the disruption of community peace, loss of cultural values, high crime rate, abuse, and delinquency (Rafferty n.d.).

Research Setting

The Federal Republic of Nigeria is located within latitudes 4° to 14°N of the Equator and longitudes 3° to 15°E of the Greenwich Meridian (Figure 1). The country is bounded by Cameroon and Chad in the east; Niger Republic in the north; Benin Republic in the west and the Gulf of Guinea (Atlantic Ocean) in the south. The study is focused on parts of the Federal Capital Territory (FCT) and Nasarawa State in the North-Central Nigeria. It covers a total of 173.73 km² growth corridor along the Abuja–Keffi dual carriage way including Yanyan, Mararaba, Ado/New Karu, Koroduma, New Yanyan, Masaka, and Kuchikau settlements (Figure 2). These settlements have witnessed tremendous growth over the years due to influx of people from different parts of Nigeria.

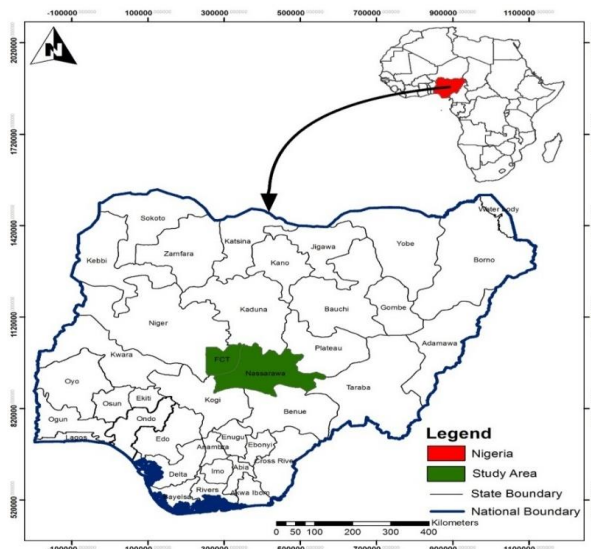


Figure 1: Location of FCT and Nasarawa State in Nigeria
 Source: Department of Urban and Regional Planning, FUT Minna 2015

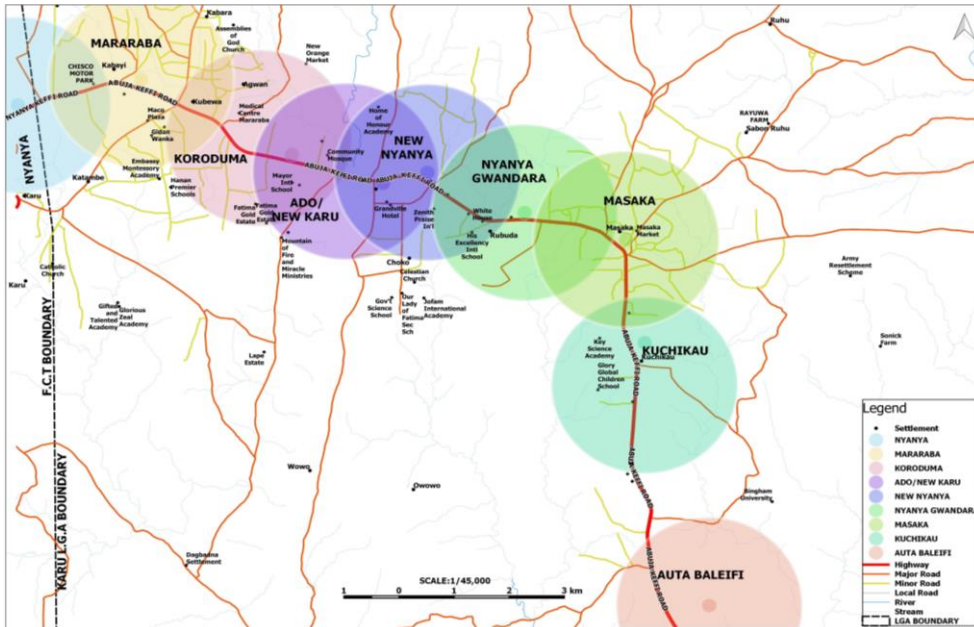


Figure 2: Sprawling Settlements in the Abuja – Keffi Road Growth Corridor
 Source: Nasarawa Geographic Information System (NAGIS) 2019

Research Methodology

The study used satellite images and other primary data collected from the study area through field survey. The satellite images were downloaded from Global Land Cover Facilities and Global Visualization Viewer Websites. The imageries used are the Landsat ETM+ of 2002, 2007, 2012, and 2017 with 30 meter resolution. In the image analysis, bands 4, 3, 2 were used to form the “False Colour” Composite of the study area. These bands were combined with the use of the New Map List tool of ILWIS 3.3 Academic software. Image classification was done by creating Sample Sets (Built-up Area, Disturbed Vegetation, Undisturbed Vegetation and Water Body) on the Landsat images. The sample sets were used as training sites. The images were later subjected to full Gaussian Maximum Likelihood Classification (Supervised Classification) and the land cover area (in Km²) for each class or sample set was determined. The image classification analysis was done with the aid of the Classifier tool of ILWIS 3.3 Academic. The classified images were thereafter taken to layout view where features like coordinates, legend, scale and cardinal point were added to the Maps. The composed maps were exported and saved in Bitmap and JPEG formats for ease of handling.

The growth statistics were generated from the coverages derived from the image classification exercise using the statistical tool of the ILWIS 3.3 Academic software. The annual growth rates were calculated using the formula: $r = \frac{\Delta A}{n A_0} \times 100$

Where:

r = growth rate

ΔA = change in area extent between 2002 and 2007

A₀ = Area extent of the base year (2002)

n = number of years.

Assessment of Urban Sprawl in North-Central Nigeria

The trend in urban development in the Nyanyan–Mararaba–Masaka growth corridor along the Abuja–Keffi highway is presented in Figure 3. In the year 2002, the epicenters of growth were located in Nyanyan, Mararaba, and Masaka from where development spread to other areas. Analysis of the scale of urban sprawl in the area between year 2002 and 2007 revealed that urban development in the area increased from 19.10 km² to 31.07 km² indicating a 67 percent magnitude of growth in a five year period (Table 1). The calculated annual settlement growth rate for this period is 12.5 percent. The growth in the built-up area had negative consequences for the natural resources of the area as the disturbed and undisturbed vegetation decreased by -6.07 km² and -5.88 km² respectively.

The high rate of physical development in the area was sustained in the 2007–2012 period as the built-up areas increased from 31.07 km² to 54.50 km² with a 76.38 percent magnitude of growth. The 2007 – 2012 period witnessed significant urban growth as the area recorded 23.73 km² of physical expansion with the consequent substantial loss (-23.83km²) in the vegetal cover of the area (Table 2). The annual growth rate of physical development stood at 15.3 percent in the 2007–2012 period.

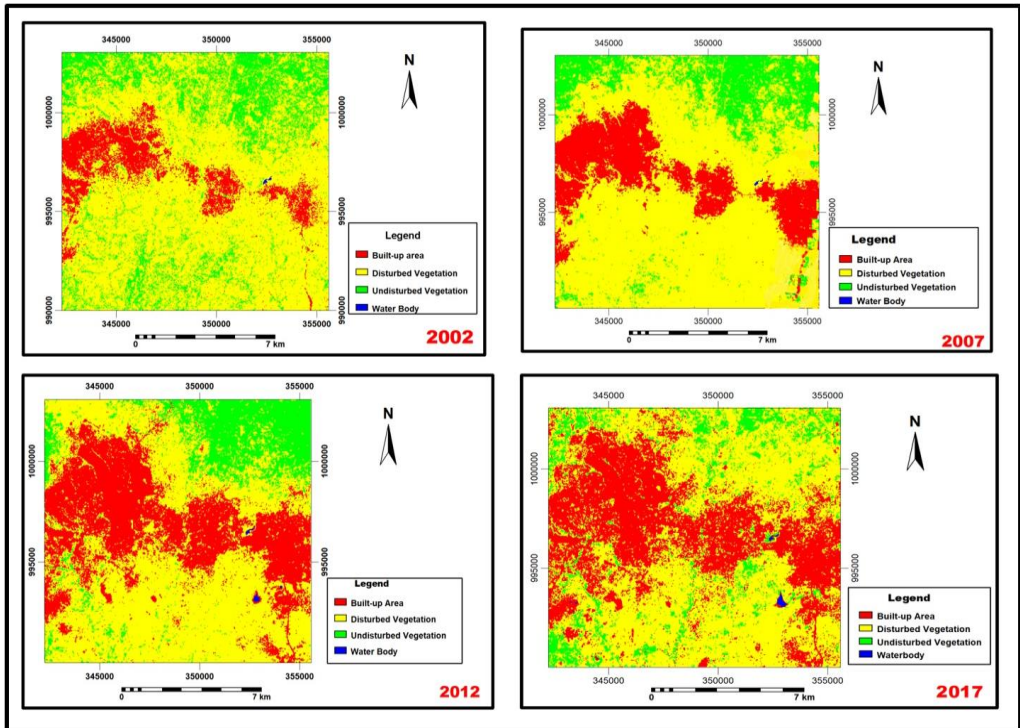


Figure 3: Trends in Urban Development, 2002–2017
 Source: Junaid, Abdulraheem, and Adeleye 2018

Table 1: Changes in Land Cover between 2002 and 2007

Land cover	2002 (KM ²)	2007 (KM ²)	Magnitude of change	Annual Frequency of Change	Percentage of Change
Built-up	19.10	31.07	11.97	2.39	62.67
Disturbed Vegetation	122.08	116.01	-6.07	-1.21	-4.97
Undisturbed Vegetation	32.49	26.61	-5.88	-1.18	-18.10
Total	173.67	173.69	-	-	-

Source: Junaid, Abdulraheem, and Adeleye 2018

Table 2: Changes in Land Cover between 2007 and 2012

Land cover	2007 (KM ²)	2012 (KM ²)	Magnitude of change	Annual Frequency of Change	Percentage of Change
Built-up	31.07	54.80	23.73	4.75	76.38
Disturbed Vegetation	116.01	93.83	-22.18	-4.44	-19.12
Undisturbed Vegetation	26.61	24.96	-1.65	-0.33	-6.20
Total	173.69	173.59	-	-	-

Source: Junaid, Abdulraheem, and Adeleye 2018

The analysis of urban growth in the 2012–2017 period shows that physical development in the area increased from 54.80 km² in 2012 to 60.19 km² in 2017 with only 9.84 percent magnitude of change in growth (Table 3). The annual growth rate is approximately 2.0 km². The results show further depletion of the natural vegetation of the area by -8.27 km² even though the disturbed vegetation category recorded an increase of 2.81 km². The increase could be attributed to urban agriculture and the planting of ornamental gardens in schools and residential houses in the area.

Table 3: Changes in Land Cover between 2012 and 2017

Land cover	2012 (KM ²)	2017 (KM ²)	Magnitude of change	Annual Frequency of Change	Percentage of Change
Built-up	54.80	60.19	5.39	1.08	9.84
Disturbed Vegetation	93.83	96.64	2.81	0.56	2.99
Undisturbed Vegetation	24.96	16.69	-8.27	-1.65	-33.13
Total	173.59	173.52	-	-	-

Source: Junaid, Abdulraheem and Adeleye 2018

The observed sprawl development in the area is ascribed to the creation of the Federal Capital Territory (FCT) in 1976, the building of the Federal Capital City (FCC)–Abuja, and the subsequent movement of the Nigerian Federal Capital from Lagos to Abuja in 1991 (Junaid 2018). At inception, the FCC was developed as a millionaire city without sufficient accommodation for the low income people. Since the transfer of government establishments to the FCC between 1986 and 1997 and the subsequent influx of public and private workers, the rural satellite settlements along the Abuja–Keffi highway have witnessed tremendous growth with the Nyanyan–Mararaba–Masaka axis developing into a continuous massive urban complex.

The nature of sprawl development in the area featured both dense/compact developments along the Abuja–Keffi road corridor as well as dispersed, leap frogging developments in the far hinterland of the road. Figure 4 shows the nature of physical development around Nyanyan, Mararaba, Ado/New Karu New Nyanyan areas in the growth corridor.

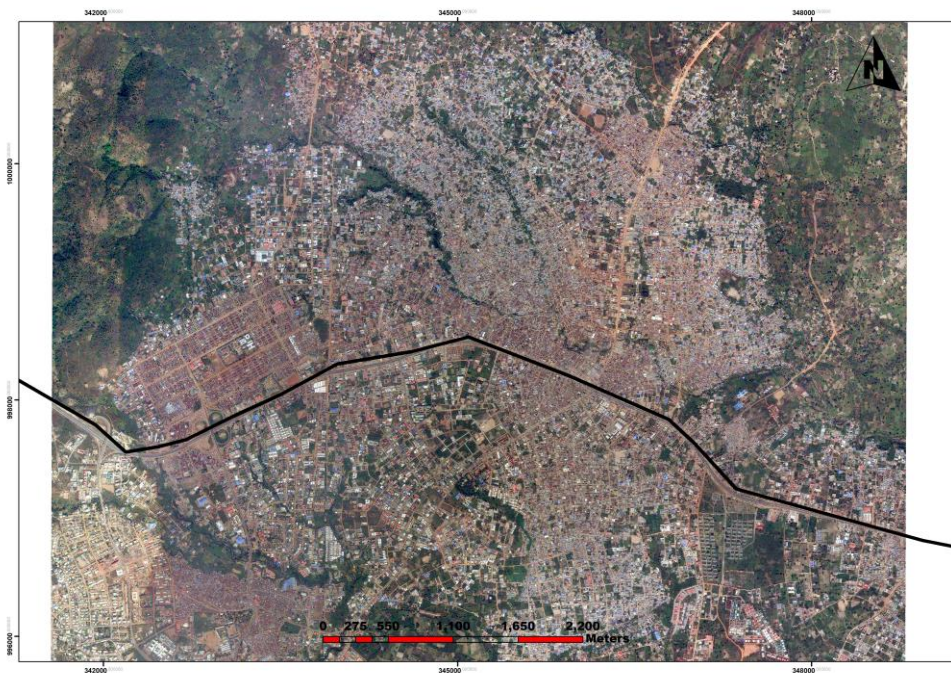


Figure 4: Compact and Leap-Frogging Development along Abuja – Keffi Highway
 Source: <http://www.bing.com/maps2342020>

The rate of urban expansion monitored over the 10-year period (2002–2012) is quite phenomenal. The urban expansion rate for most towns and cities in Nigeria is put at above 2 percent per annum and the statistics quoted from the atlas of urban expansion show that the rate of expansion for Ibadan and Lagos in Nigeria were 2.8 percent and 2.6 percent respectively in 2013 (Avis 2019). The annual expansion rate of 12.5 percent and 15.3 percent recorded in the study area between 2002 and 2012 are therefore far above the national average. However, the situation within the 2012–2017 period shows that urban growth gradually stabilized in the area even though the settlements were still growing. Hence, it is observed that the annual urban development growth rate of 12.5 percent within the 2002–2007 period, which rose to 15.3 percent, dropped to as low as 2.0 percent from 2012–2017.

The gradual stabilization of urban sprawl in the study area could be explained by the reduction in population influx as compared with the situation in the late 1990s. Also, most lands in the road corridor were becoming fully built-up, with the few available lands becoming too expensive. In addition to this, the relatively cheap rural lands in the far hinterland lacked Urban Basic Services and thus do not attract rapid physical development.

Effects and the Challenges of Urban Sprawl

The high rate of urbanization and the consequent growth of urban settlements in Nigeria are fraught with lots of problems as many of the towns and cities have grown without proper physical planning (Junaid 2018). The sprawl development in the Nyanyan–Mararaba–Masaka

area has a lot of negative effects. Field investigation reveals that the area is characterized by unplanned development and poor accessibility with most of the narrow, winding roads lacking in adequate drainages and setbacks. Other negative effects of the sprawl development include uncontrolled physical development, flood plain occupation, inadequate water and waste disposal facilities, slum development, poor environmental condition, street trading and traffic grid lock along the Abuja–keffi dual carriage way (see Figures 5–8).



Figure 5: Flood Plain development in Ado Area
Source: Junaid, Abdulraheem, and Adeleye 2018



Figure 6: Solid Waste Problem in Mararaba
Source: Junaid, Abdulraheem, and Adeleye 2018



Figure 7: Poor Accessibility in Masaka Area
Source: Junaid, Abdulraheem and Adeleye 2018

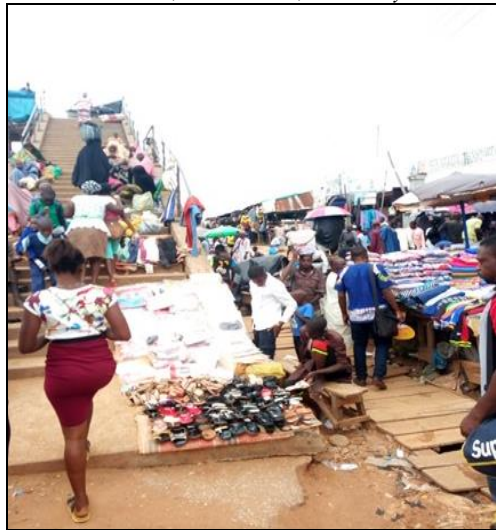


Figure 8: Street Trading in Mararaba Area
Source: Junaid, Abdulraheem and Adeleye 2018



Figure 9: Karu–Nyanyan–Mararaba Road Traffic Jam
 Source: scannewsnigeria.com 2019

The sprawl development in the study area engenders some physical planning challenges. In the early 1980s, the area was characterized by small villages with no planning attention. However, the influx of population and large scale physical development within a short period of time has overwhelmed the Zonal offices of Nasarawa Urban Development Board (NUDB). As it was, the Board lacked adequate technical manpower and equipment to monitor and enforce compliance with building codes or regulations in the area. Thus, there has been a proliferation of informal settlements along the growth corridor with most of the houses constructed without planning approval or permit.

As a result of close proximity to Abuja, the area had witnessed large scale acquisitions by private individuals as well as corporate organizations over the years. Therefore, another major challenge is that large scale of developments in the area occurred on private lands with customary titles which were secured from the natives. This makes official development control difficult as people develop their properties haphazardly without recourse to planning regulations.

There is also the problem of trans-boundary development. The sprawl development spanned little part of FCT (Old Karu and Nyanyan) while the substantial part of the sprawl development is occurred in Karu Local Government of Nasarawa State and this makes jurisdictional control a major issue. The jurisdictional issue breeds physical planning complacency between the Development Control Department of the FCT and Nasarawa Urban Development Board (NUDB). The NUDB that has jurisdiction on the substantial part of the sprawl area has low capacity while the Development Control Department of the FCT with a higher capacity and political will do not have control over the substantial part of the problem area.

Conclusion and Recommendation

The massive, unplanned development at the Nyanyan–Mararaba–Masaka growth corridor along the Abuja–Keffi road is a serious issue to contend with in North-central Nigeria. Urban growth in the area is haphazard with low quality development and the attendance of socioeconomic and environmental problems. The sprawl development requires urgent attention to ameliorate the problems. There is the need for a purposeful and high level physical planning intervention, urban renewal, and land use planning in the area. The required physical planning intervention should focus on effective development control activities such as building regulation and development prohibitions in marginal areas (e.g. buffering and exclusion of areas from development activities). Other market based development control mechanisms such as imposition of taxes to

discouraging unwanted development and provision of subsidies and infrastructure to encourage infill development in leap-frogged areas should be introduced to discourage sprawl development. Urban renewal programs should be instituted in all settlements in the growth corridor. Renewal activities in the area should focus on settlement rehabilitation to inject the necessary urban basic services such as roads, drainages, water and waste disposal facilities in the poor neighborhoods of the settlements. Also, land use planning in form of zoning and residential/industrial development schemes should be instituted at the peripheral areas to stem the tide of sprawl and haphazard development in the area. The development control and land use planning measures recommended are practical global approaches with wide applicability in the study area. These measures should be implemented in the study area and could also be applied to other towns and cities like Suleja, Lagos, Ibadan, and Sango Otta that exhibit similar features of urban sprawl and the challenges of sustainable physical planning in Nigeria.

Sustainable management of urban sprawl in the area requires cooperation and coordination across administrative boundaries. The effective use of inter jurisdictional cooperation in the management of urban sprawl has been demonstrated in the cases of “Haaglanden” in the Hague Region, the “Puget Sound Regional Council (PSRC)” around Seattle and the “Greater Manchester Combined Authority” in the United States (Fertner, Jorgensen, Nielsen and Nilsson 2016). There is the need for synergy between the Development Control Department of the Federal Capital Territory administration (FCDA) and Nasarawa State Urban Development Board (NUDB) in the management of physical development in the area. In order to give the required urban management cooperation the necessary administrative and political backing, an autonomous joint physical planning taskforce should be established to manage the growth of the area. This will resolve the problem of planning complacency and ensure effective management of urban growth in the sprawl area.

REFERENCES

- Avis, William Robert. 2019. “Urban Expansion in Nigeria.” *K4D Helpdesk Report 692*. Brighton, UK: Institute of Development Studies. https://assets.publishing.service.gov.uk/media/5df7b30040f0b60959adc747/692_Urban_Expansion_of_Nigerian_Cities.pdf.
- Bloch, Robin, Sean Fox, Jose Monroy, and Adegbola Ojo. 2015. *Urbanization and Urban Expansion in Nigeria*. London: ICF International. <https://core.ac.uk/download/pdf/96701289.pdf>.
- Etim, Joyce. 2018. “Urban Sprawl: Meaning, Causes, Effects of Urban Sprawl and Solutions.” March 13, 2018. <https://www.jotscroll.com/forums/3/posts/207/urban-sprawl-meaning-causes-effects-solutions-of-urban-sprawl.html>.
- Fertner, Christian, Gertrud Jørgensen, Thomas Alexander Sick Nielsen, and Kjell Svenne Bernhard Nilsson. 2016. “Urban Sprawl and Growth Management—Drivers, Impacts and Responses in Selected European and US Cities.” *Future Cities and Environment* 2 (9):1–13. <https://doi.org/10.1186/s40984-016-0022-2>.
- Junaid, Asimiyu Mohammed. 2018. “Urbanization and Urban Development in the Federal Capital Territory of Nigeria, 1987–2014.” In *100 Years of Urbanization in Nigeria*, edited by Yekeen Adeyo Sanusi, Asimiyu Mohammed Junaid, Oluwole Olakanmi Morenikeji, Stella Nonyelum Zubairu, Richard Ajayi Jimoh, and Olatunde Folaranmi Adedayo, 46–66. Minna: Ajiboye Printers Limited.
- Nnaemeka-Okeke, Rosemary. 2016. “Urban Sprawl and Sustainable city Development in Nigeria.” *Journal of Ecological Engineering* 17 (2): 1–11. <https://doi.org/10.12911/22998993/62277>.

- Onibokun, Adepoju and Faniran, Adetoye.1995. *Urban Research in Nigeria*. Ibadan: IFRA-Nigeria.
- Polidoro, Mauricio, Jose Augusto de Lollo, and Mirian Vizintim Fernandes Barros. 2012. "Urban Sprawl and the Challenges for Urban Planning." *Journal of Environmental Protection* 3 (9): 1010–19. <https://doi.org/10.4236/jep.2012.39117>.
- Rafferty, John. P. n.d. "Urban Sprawl." Encyclopedia Britannica (online). Accessed on September 3, 2018. <https://www.britannica.com/topic/urban-sprawl>.
- Rikko, S. Laraba, and Laka I. Shola. 2013. "Monitoring Urban Sprawl in Greater Karu Urban Area (GKUA), Nasarawa State, Nigeria." *Journal of Environment and Earth Science*. 3 (13): 1–9. <https://www.iiste.org/Journals/index.php/JEES/article/view/9856>.
- Ujoh, Fanan, Isa D. Kwabe, and Olarewaju Oluseyi Ifatimehin. 2010. "Understanding Urban Sprawl in the Federal Capital City, Abuja: towards Sustainable Urbanization in Nigeria." *Journal of Geography and Regional Planning* 3 (5): 106–13. https://academicjournals.org/article/article1381151577_Ujoh%20et%20al.pdf.
- United Nations. 2014. "World Urbanization Prospects: The 2014 Revision." July 10, 2014. <https://www.un.org/en/development/desa/publications/2014-revision-world-urbanization-prospects.html>.
- Wilson, Bev, and Arnab Chakraborty. 2013. "The Environmental Impacts of Sprawl: Emergent Themes from the Past Decade of Planning Research." *Sustainability* 5 (8): 3302–27. <https://doi.org/10.3390/su5083302>.
- World Bank. 2016. *From Oil to Cities: Nigeria's Next Transformation*. <http://documents.worldbank.org/curated/en/711661468010811972/From-oil-to-cities-Nigeria-s-next-transformation>.

ABOUT THE AUTHORS

Prof. Asimiyu Mohammed Junaid: Lecturer, Department of Urban and Regional Planning, Federal University of Technology, Minna, Niger State, Nigeria

Dr. Maimuna Orire Abdulraheem: Head of Department, Urban and Regional Planning Department, University of Ilorin, Kwara State, Nigeria

Mr. Bamiji Michael Adeleye: Leacurer, Department of Urban and Regional Planning, Federal University of Technology, Minna, Niger State, Nigeria

The International Journal of the Constructed

Environment publishes broad-ranging and interdisciplinary articles on human configurations of the environment and the interactions between the constructed, social, and natural environments. The journal brings together researchers, teachers, and practitioners. The resulting articles weave between the empirical and the theoretical, research and its application, the ideal and the pragmatic, and spaces that are in their orientations private, public, communal, or commercial.

As well as papers of a traditional scholarly type, this journal invites presentations of practice—including experimental forms of documentation and exegeses that can with equal validity be interrogated through a process of academic peer review. This might, for instance, take the form of a series of images and plans, with explanatory notes that articulate with other significantly similar or different and explicitly referenced places, sites, or material objects.

The International Journal of the Constructed Environment is a peer-reviewed, scholarly journal.