

THE JUST CITY

Poverty, Deprivation and
Alleviation Strategies

16

17



In honour of
Professor David Oloruntoba Olanrewaju

Editors:

O. B. Akinbamijo
E. E. Okoko
F. K. Omole
O. O. Popoola

List of Reviewers

1. ¹Professor E.E. Okoko
2. ¹Professor J.A.B. Olujimi
3. ¹Professor J.O. Fasakin
4. ³Professor G. Fadamiro
5. ¹Professor O.B. Akinbamijo
6. ⁴Professor E.O. Ibem
7. ¹Dr. A.E. Olajuyigbe
8. ¹Dr. M.A. Oyinloye
9. ⁴Dr. A. Oluwatayo
10. ⁶Dr. T.O Lawanson
11. ²Dr. Ogunleye Bamidele M
12. ²Dr. M.A. Adebayo
13. ²Dr. Mrs. R.A. Oladapo
14. ¹Dr. O.O. Rotowa
15. ⁵Dr. S.A. Adegboyega
16. ¹Dr. M.O. Alabi
17. ⁷Dr. Tayo Odunola
18. ¹Dr. A.O. Olusa
19. ¹Dr. I.O Olamiju
20. ¹Dr. O.O Popoola
21. ¹Dr. J.O. Owoeye
22. ¹Dr. G. Emmanuel
23. ¹Dr. B.O. Owolabi

¹ Department of Urban and Regional Planning, Federal University of Technology Akure

² Department of Estate Management, Federal University of Technology Akure

³ Department of Architecture, Federal University of Technology Akure

⁴ Department of Architecture, Covenant University, Otta, Ogun State.

⁵ Department of Remote Sensing and Geoscience Information System, Federal University of Technology Akure

⁶ Department of Urban and Regional Planning, University of Lagos, Akoka, Lagos

⁷ Department of Urban and Regional Planning, Ladoke Akintola University of Technology Ogbomosho.

Title page
 List of Reviews
 Editors
 Table of Contents
 Acknowledgements
 Foreword
 Copyright
 Declaration
 Authors' Note
 Introduction
 Biography of the Editors

THE JUST CITY

Poverty, Deprivation and Alleviation Strategies

Editors

O. B. Akinbamijo
 E. E. Okoko
 F. K. Omole
 O. O. Popoola

Theme One: The State and the Urban Poor

1. The State and the Urban Poor: A Review of the Literature
2. The State and the Urban Poor: A Review of the Literature
3. The State and the Urban Poor: A Review of the Literature
4. The State and the Urban Poor: A Review of the Literature
5. The State and the Urban Poor: A Review of the Literature
6. The State and the Urban Poor: A Review of the Literature
7. The State and the Urban Poor: A Review of the Literature
8. The State and the Urban Poor: A Review of the Literature
9. The State and the Urban Poor: A Review of the Literature
10. The State and the Urban Poor: A Review of the Literature
11. The State and the Urban Poor: A Review of the Literature

THE JUST CITY

Poverty, Deprivation and Alleviation Strategies

Published by:
Department of Urban and Regional Planning
Federal University of Technology
Akure, Ondo State, Nigeria.

© Copyright: September, 2018
Department of Urban and Regional Planning
Disclaimer: The views expressed in the papers are those of the contributors.

Correspondence:
All correspondence pertaining to the book should be sent to the Head, Department of Urban and Regional Planning, Federal University of Technology Akure

ISBN: 978-978-54735-7-5

Published & Printed By:
YEMPET Prints Ltd,
#1, Powerline Road, Omolere, Akure
Ondo State Nigeria.
+234 803 7271 965, +234 803 4741 314

Cover Design: Rowland Olawale
+234 810 6151 712, +234 805 6220 415

TABLE OF CONTENTS

Title page	
List of Reviewers	
Editors	
Table of Contents	
Acknowledgements	
Foreword	
Copyright Statement	
Declaration of Peer Review and Scientific Publishing Policy	
Authors' Profile	
Introduction: Prof. O. B. Akinbamijo	
Biography of Professor D. O. Olanrewaju	
Theme One: Poverty Alleviation strategies in Nigeria	1
1. Poverty alleviation in Nigeria: the role of rural infrastructure development Olujimi, J. A. B. and Bako, A. I	2
2. Employing locally-endowed resources in rural income generating activities for poverty alleviation in Ijesa region, Osun state, Nigeria Faseun, J. O., Olanrewaju, D. O. and Olujimi, J. A. B.	14
3. Tackling the problems of private housing finance for poverty alleviation in Damaturu, Nigeria Ogunleye, B. M. and Zakriyyah, O. B.	27
4. Modelling urban poverty in Akure metropolis using geospatial mapping Ogunlade, S. O.	34
5. Poverty implication of market patronage on traffic congestion in Benin City, Nigeria. Ayo-Odifiri, O. S, Fasakin, J. O., and Okoko, E. E.	46
6. Community-Based organisations as agents of change in poverty alleviation: Measuring households' satisfaction Odunola, O. and Odunsi, O.	55
7. Benefits of sustainable recreational spaces to poverty reduction in Akure, Ondo State, Nigeria Ajenifujah-Abubakar, A. O. and Fadamiro, J. A.	71
Theme Two: Environmental Justice as a Vehicle of Social Change	81
8. Ecological Imperialism and armed struggle for environmental justice in the Niger-Delta region of Nigeria. Alabi, M. A. and Omirin, O. J.	82
9. Ecosystem Services Assessment for Human Well-Being and Poverty Alleviation in the Ondo State Coastal Region, Nigeria Popoola, O. O., Olajide, A. and Ajayi, D. B.	96
10. The effect of improper solid waste disposal in core residential area of Akure, Ondo State, Nigeria Omodehin, A. O.	114
11. Climate change actions: Towards managing vulnerability Odufuwa, B.O., Omoniyi, S. S., Ukonze, F. I. and Orakwue, C. A.	127

TABLE OF CONTENTS

Title page	
List of Reviewers	
Editors	
Table of Contents	
Acknowledgements	
Foreword	
Copyright Statement	
Declaration of Peer Review and Scientific Publishing Policy	
Authors' Profile	
Introduction: Prof. O. B. Akinbamijo	
Biography of Professor D. O. Olanrewaju	
Theme One: Poverty Alleviation strategies in Nigeria	1
1. Poverty alleviation in Nigeria: the role of rural infrastructure development Olujimi, J. A. B. and Bako, A. I	2
2. Employing locally-endowed resources in rural income generating activities for poverty alleviation in Ijesa region, Osun state, Nigeria Faseun, J. O., Olanrewaju, D. O. and Olujimi, J. A. B.	14
3. Tackling the problems of private housing finance for poverty alleviation in Damaturu, Nigeria Ogunleye, B. M. and Zakriyyah, O. B.	27
4. Modelling urban poverty in Akure metropolis using geospatial mapping Ogunlade, S. O.	34
5. Poverty implication of market patronage on traffic congestion in Benin City, Nigeria. Ayo-Odifiri, O. S, Fasakin, J. O., and Okoko, E. E.	46
6. Community-Based organisations as agents of change in poverty alleviation: Measuring households' satisfaction Odunola, O. and Odunsi, O.	55
7. Benefits of sustainable recreational spaces to poverty reduction in Akure, Ondo State, Nigeria Ajenifujah-Abubakar, A. O. and Fadamiro, J. A.	71
Theme Two: Environmental Justice as a Vehicle of Social Change	81
8. Ecological Imperialism and armed struggle for environmental justice in the Niger-Delta region of Nigeria. Alabi, M. A. and Omirin, O. J.	82
9. Ecosystem Services Assessment for Human Well-Being and Poverty Alleviation in the Ondo State Coastal Region, Nigeria Popoola, O. O., Olajide, A. and Ajayi, D. B.	96
10. The effect of improper solid waste disposal in core residential area of Akure, Ondo State, Nigeria Omodehin, A. O.	114
11. Climate change actions: Towards managing vulnerability Odufuwa, B.O., Omoniyi, S. S., Ukonze, F. I. and Orakwue, C. A.	127

Theme Three: Urban Economics and Municipal Development on City of Today	139
12. Space utilization by street vendors based on location characteristics in Sub-Saharan, case of Akure, Nigeria Alabi, M. O.	140
13. Impact of urban regulations on the residents in Lagos, Nigeria Izobo-Martins, O. O., Ayo-Vaughan, E. O., Ekhasas, E. M and Babalola, D. O	157
14. Effect of contiguity of homes and gardens on residents' quality of life in Akure, Nigeria Adedeji, M. D. and Fadamiro, J. A.	168
Theme Four: Urbanization Dynamics and City Lifecycles	181
15. Urbanization dynamics and city formation in Nigeria Omole, F. K., Enisan, O. F., Adeniran, I. A. and Adebisi, A.	182
16. Urban rejuvenation as a means of enhancing quality of life in residential neighbourhoods of Akure, Nigeria Nwosu, A. E. and Olofa, S.	198
17. Analysis of some factors influencing residential conversion in urban Auch, Nigeria Ayo-Odifiri, O. S., Fasakin, J. O. and Omole, F. K.	210
18. Urbanization and change in land use land cover patterns in Akure, Nigeria Omodehin, A. O.	218
19. Urban sprawl, deprivation and sustainable urbanism nexus in Akure, Nigeria Owoeye, J. O., Fasakin J. O. and Adeniran, I. A.	229
20. Analysis of expansion in a rapidly urbanizing town of Ore, Nigeria Olanrewaju, D. O. and Oyinloye, M. A.	243
21. Assessment of housing need situation of urban poor in Agege LGA, Nigeria Owoeye, J. O. and Olajuyigbe, A. E.	257
22. Concern for the poor in Smart Cities: Towards greater inclusiveness of future cities Emmanuel A. A. and Lawanson, T. O.	269
Theme Five: Environmental Deprivation and Marginalization	283
23. Stronger property rights for the "Weaker Vessel": A panacea to social and economic deprivation of Women in Southern Nigeria. Ajayi, M. A.	284
24. Economic deprivation of informal sector workers in oil producing communities of Niger Delta region, Nigeria. Olukolajo M. A. and Ajayi M. A.	294
25. Juvenile deprivation in child labour in residential densities of Akure, Nigeria Fasakin, J.O., Gabriel, E. and Akande, D.	305
26. Problems of spatial deprivation in Nigeria: The smart city approach Bako, A. I., Ola A. B. and Abdulyekeen, A. O.	381
27. Self-Help infrastructure for inclusive city growth and poverty reduction in Peri-Urban communities of Akure, Nigeria. Olamiju I. O, Fasakin J. O and Aluko E. A.	331

CHAPTER TWENTY-SIX

Problems of Spatial Deprivation in Nigeria: The Smart City Approach

- Bako, A. I., Ola, A. B., Abdulyekeen, A. O

1.0 Introduction

The question of spatial deprivation has been the focus of urban research for decades. Theoretical approaches and far-reaching empirical studies have been conducted, to determine the causes, effects as well as proffering solutions to the problem. Deprived urban areas have structural and urban design deficiencies, as well as deficient infrastructure, and suffer from comparatively severe environmental burdens (Great Britain, Office of the Deputy Prime Minister Government, 2004; Pablo et. al., 2016). Generally speaking, it is manifested physically in the run-down and squalid state of the area, comparatively high vacancy rates, a wide range of derelict and vacant sites, a lack of greenery and open spaces, inadequate facilities in the social and employment infrastructure.

Functionally, it is manifested through the strong adverse impacts of traffic facilities and their operation (streets, rail bound traffic, logistic centres), through relatively low environmental quality, deficient quality in existing facilities (e.g., schools, further educational and cultural facilities), through the lack of high-quality jobs; and socially in the concentration of residents with low incomes, high unemployment and without school-leaving qualifications or vocational skills (Grant, 2010). For instance, as reported by Olotuah (2006), 75% of the dwelling units in Nigerian cities are substandard and the dwellings located in slums. The slum population constitutes about 50.2% of the urban dwellers (World Bank, 2014) who mostly live on less than \$2 per day (World Bank, 2014). Majority of these class of urban dwellers are either unemployed or underemployed (NBS, 2017) because a substantial percentage (34%) are not literate (UNICEF, 2016) while the literates have low academic qualifications that make them unsuitable for better job. The state of infrastructural facilities including transportation system in these not-too-favoured neighbourhoods is at the abysmal level (Ola and Adewale, 2013). Thus, deprived urban areas are associated with the actual or potential risk of social exclusion.

The term 'social exclusion' refers to more than poverty or low income, but it is closely related to them. It is used to describe a number of linked problems such as unemployment, poor educational achievement, low incomes, poor housing, physical barriers and bad health, which tend to have a cumulative and reinforcing effect on each other, preventing people from participating in society (Pampalon and Raymond, 2000).

The problem of spatial deprivation in Nigeria can be traced to the advent of colonialism. Colonialism brought about a deliberate policy of dual urban development with the European neighbourhoods receiving better governmental attention than the native areas (Oyesiku, 2004). Since the emergence of deprived urban space in Nigeria, a number of factors have aggravated the problem. Principal among these factors are

1.1 High, Spontaneous and Uncontrolled Urbanization: Like many developing countries, Nigeria has experienced especially since political independence one of the fastest rate of urbanization in the world. For instance, the 1992 National Population Census put Nigeria population at 30.4 million out of which 3.2 million (10.5%) people were living

in 56 urban centres (Afolayan, 1978). By 1963, the population of Nigeria had increased to 55.67 million out of which 10.6 million (19%) people were then living in 183 cities and towns (Afolayan, 1978). The 1991 National Population Census gave the population of Nigeria at 88.5 million and it shows that Nigeria urban population had risen to 36.3% of the total population with 359 urban centres existing in the country then (DFID, 2005). The result of the 2006 National Population Census gave the total population of Nigeria as 140,542,032. Current estimate puts Nigeria population at 191.8 million representing about 2.48% of the world's population and with about 49.4% of the population living in urban centres (CIA, 2017). The country population has however been projected to be 411 million by the year 2050 with 56% of these being urban dwellers (UN, 2017). This was based on the 4.3% annual growth rate for urban population as against 2.4% for the total population. One significant feature of the urbanization process in Nigeria and most African countries is that unlike the countries of the West, much of the growth is taking place without adequate preparation by the cities in terms of housing, infrastructural development and basic services. These have not only progressively complicated and exacerbated interrelated problems of the cities, but have also greatly accelerated urban poverty and deprivation.

1.2 Infrastructural Inadequacy: It is noteworthy that provision of infrastructural facilities like roads, water, electricity, sewerage systems and comprehensive city planning and development engenders high quality urban environment. However successive administrations at the federal, state and local level have failed to adequately provide this basic infrastructural facilities resulting in increasing urban poverty, housing shortages and poor sanitation (Ola, 2010).

1.3 Lack of Secure Access to Land: One of the major features of deprived urban areas is the overcrowding and unsanitary living condition of residential neighbourhoods. This has been the direct consequence of housing shortage due to limited or lack of secure access to land. Land accessibility entails land tenure security, land affordability, land availability and the ease with which land is acquired (Agbola, 1998). Evidence abounds in urbanization studies in developing countries to buttress the fact that where land has been made available, even the poor have been able to incrementally develop their residential houses (Mustapha, 2002). Outside its Physical direct importance to man, society and the state, land also remains to date, the most viable and always sought after security for bank loan and security advanced and a pillar in the development of effective and efficient commerce in Nigeria (Bako, 2017). Thus, the way and manner land ownership is structured, title is obtained and land documentation and transaction is framed has a direct impact on the nation's economy and man's development. It is therefore, imperative that the management of such core resources should be done as to produce the best for the benefit of man. However, the fundamental difficulty in achieving land accessibility is the promulgation of Land Use Act of 1978 (Cap L5 LFN, 2005) which created a dual structure of land delivery systems i.e. customary and state systems. Although, the Act which vests ownership of all land on the Governors was enacted to make land more accessible for housing development but rather than facilitate easier access to land, the Act has made it extra difficult for intending land developers to get land while top government officials have been using it arbitrarily (Akinmoladun and Oluwoye, 2007). Consequently, housing production has been on slow pace leading to overcrowding especially in the low income neighbourhoods of most Nigerian cities. NBS (2013) put existing housing stock at 23 per 1000 inhabitants while housing deficit is put at 17-18 million houses. Lagos for instance, has about 5 million deficits (LSG, 2018).

1.4 High Cost of Construction: Over the years, construction costs have remained high due to the relentless inflationary pressure on the building materials and labour market. Before now, emphasis has been on high cost of building materials but experience has shown that cost of labour has risen to between 25 – 30% if not more of cost of construction (Ademiluyi, 2010). This has resulted in acute housing shortage in Nigerian urban centres especially in the low income deprived neighbourhoods.

1.5 Limited Access to Finance: The problem of high construction cost is aggravated by limited access to finance. This could be attributed to underdevelopment in Nigeria mortgage industry. According to World Bank Report (2008) the contribution of mortgage finances to Nigeria's Gross Domestic Product (GDP) is close to negligible with real estate contributing less than 5% and mortgage loans and advances at 0.5% of GDP, compared to 77% in the US, 80% in the UK, 50% in Hong Kong and 33% in Malaysia. The poor performance of the country's mortgage system may be partly attributed to the inability of many developers to formally register their land titles. As stated by UN (2005), less than 5% of land in Nigeria has formal title registration. This indicates that majority of Nigerian land owners are not even qualified to apply for mortgage/loan facility as no financial institution will grant facility with an unregistered title as collateral. Limited access to finance invariably impedes efforts by residents of deprived neighbourhoods to carry out necessary rehabilitation of their houses and neighbourhood facilities.

Attempt to address the problems of spatial deprivation have led to the development of some models and approaches aimed at minimizing or eliminating the problems. Such approaches include Multi-Criteria Deprivation Index, Green Technologies, and Intelligent Transport etc. Multi-Criteria Deprivation Index are factors or variables that are considered to determine deprivation. It involves using a rights-based approach to choose the factors that make up the deprivation index, taking into account the framework of good living that is based on human rights and nature rights. The good living concept considers that in order to achieve a better quality of life including time for leisure and harmony with nature, basic need should first be satisfied. This approach has been used by a number of cities to determine their deprived neighbourhoods such as Toronto (Canada) (McHenry and Rinner, 2016) and Quito (Equador) (Barona et al., 2015). This approach was designed to assist decision makers in properly identifying deprived urban areas, it does not suggest measures to address deprivation in the identified neighbourhoods.

Green Technologies are environmentally supportive technologies and services, which are affordable, adaptable and available for use especially in developing countries (Reed, 2009). They are goods and services that improve the quality of air, water, soil, waste and noise related problems (Usgreentechnology, 2018). They vary from extremely complex and expensive advanced technology to more simple solutions. This technology is used to breathe life back into a damaged ecosystem. It is also referred to as environmental technology or clean technology (Usgreentechnology, 2018). The main goal is to conserve nature, and to remedy the negative impact that humans have on it. While this approach is useful in ensuring clean urban environment, it does not address infrastructural adequacy in the cities.

Intelligent Transport Systems is an arrangement in which information and communication technologies are applied in the field of road transport, including infrastructure, vehicles and users, and in traffic management and mobility management, as well as for interfaces with other modes of transport (EU, 2010). ITS may improve the efficiency of transport in a number of situations, i.e. road transport, traffic management, mobility, etc. (Monahan, 2007). The focus of

Intelligent Transport Systems is basically on the application of technology to urban transport management while other aspects of urban infrastructure are not addressed.

Many of these approaches have considered the problems from sectoral point of view. They appear to have neglected the fact that deprived neighbourhoods exist within a larger urban area and maintain constant interaction with the well-off neighbourhoods. Therefore, any attempt to address the problems of deprived neighbourhoods must take into consideration the entire urban space especially for the purpose of sustainable infrastructural development. An approach which appears to largely address this problem is Smart City Concept. Thus, the goal of this chapter is to discuss the nature, characteristics, development approach as well as benefits derivable from adopting smart city approach to address spatial deprivation problems in Nigeria.

2.0 Meaning of Smart City

A city can be defined as 'smart' when investment in social and human capital, combined with investment in traditional (transport) and modern information and telecommunication infrastructure, generates sustainable economic development and a high quality of life, while promoting prudent management of natural resources, through participatory governance (Ferrara, 2015). Another perspective which indicates that a city is 'smart' is when that city can integrate and synchronize formal leadership and endogenous democratic participation in the IT-based urban ecosystem. This means that a 'smart city' is a hybrid model combining democratized open innovation with central city support, coordination, and monitoring (ArturandPilat-Borcuch, 2016). In a narrow perspective, 'smart city' might be understood as one that uses information and communication technologies to deliver services to citizens.

In a broader aspect, 'smart cities' use information and communication technologies (ICT) to be more intelligent and efficient in the use of resources, resulting in cost and energy savings, improved service delivery and quality of life, and a reduced environmental footprint - all supporting innovation and the low-carbon economy (Lee, 2014). Giffinger (2007) defines a 'smart city' as an urbanized area where multiple sectors cooperate to achieve sustainable outcomes through the analysis of contextual, real-time information shared among sector-specific information and operational technology systems. According to European Commission (2011) "a smart city... uses digital technologies to enhance performance and well-being, to reduce costs and resource consumption and to engage more effectively and actively with the citizens". Key smart sectors include transport, energy, health care, water and waste. A smart city should be able to respond faster to urban and global challenges than one with a simple 'transactional' relationship with its citizens (Lazaroiu, and Roscia, 2012).

The characteristic features defining a smart city as outlined by Deakin (2013) are:

- i. Improving economic and administrative efficiency and enabling the development of culture and society by utilizing networked infrastructures;
- ii. An underlying emphasis on business-oriented urban development;
- iii. A strong focus on the goal of realizing the social inclusion of different kinds of urban residents in public services;
- iv. Emphasizing the significant role of high-tech and creative industries in long-term growth;
- v. Paying close attention to the function of social and relational capital in city development;
- vi. Taking social and environmental sustainability as an important aspect of 'smart city' development.

A major challenge bedeviling Nigerian cities is poor management and low capacity of municipal authorities to deliver necessary urban services and facilities (Wilson, 2013). This is largely due to the fact that there is no correlation between the tax-raising capacity of local governments and the cost of the services they are expected to perform (Ozoh-Suleiman and Chima, 2014). Although, they are constantly expected to improve on existing services but local governments have been compelled to rely principally on one source of revenue – fiscal transfers from the State Governments which is hardly enough to cater for local governments' staff salaries (Ibietan and Ndukwe, 2015). Thus, the underlying factor influencing infrastructural inadequacy and poor service delivery leading to deprivation in most urban centres in Nigeria is the inability of the local governments to perform optimally.

2.1 Smart City Indicators

Evidence from the literature shows there are basically six most-common indicators of smart cities. These are: smart economy, smart people, smart governance, smart mobility, smart environment, and smart living.

- Smart economy means competitiveness, and consequently entrepreneurial skills, economic image and trademarks, productivity, flexibility of labour market, ability to innovate, etc. (Nam and Pardo, 2011).
- Smart people are the result of ethnic and social diversity, tolerance, creativity, and engagement supported by good education. Cities may offer online courses and workshops, online assistance with education, and programs and services designed to raise social capital and qualifications (Letaifa, 2015).
- Smart governance implies participation in the decision-making process, availability of public and social services, transparent governance, good political strategies, and perspectives (Batty, 2012).
- Smart mobility implies local, national and international accessibility, for the promotion of sustainable, innovative and safe transport systems (Paskaleva, 2009).
- Smart environment simply indicates that the use of innovative technologies, such as solar energy and other renewable sources of electricity, can enhance the natural environment (Caragliu, del Bo, Nijkamp, 2009; Correia, 2011).
- Smart living concerns improving quality of life in terms of services, enhancing attractiveness for tourists, and promoting social cohesion and safety. It includes cultural facilities, e-health, social services, and public safety tools, such as surveillance systems and inter-emergency service networks (Harrison, 2010). Other tools such as smart sensors and wireless platforms exist.

2.2 Smart City Development Process

For and foremost, it is pertinent to note that software and hardware infrastructure plays a critical role in the development of a smart city. Secondly, people must be creative and willing to use that infrastructure (the infrastructure must be common and easy to use by users). And finally, there must be policy supporting this concept. However, three distinct phases of how cities can develop into smart ones using technology may be distinguished. (Shepard, 2011; Laurson, 2014; Viitanen and Kingston, 2014; Urban Tide, 2015; Gooch et al., 2015; McLaren and Agyeman, 2015).

The first phase is technology driven. This techno-centric vision of 'smart cities' creates an environment that is attractive to urban technology innovators, who in turn have the potential to grow the economy (Shepard, 2011). This phase is characterized by technology providers encouraging the adoption of their solutions to cities that were really not equipped

to properly understand the implications of the technology solutions, or how they may impact the citizen's quality of life. This technology-driven phase is also the underlying philosophy behind most of the bespoke 'smart cities' projects proposed around the globe from PlanIT in Portugal, to Songdo in South Korea (Urban Tide, 2015).

The second phase is technology enabled and city-led. In this phase, the municipality - led by forward-thinking mayors and city administrators - takes the lead in helping to determine what the future of their city is and what the role is for the deployment of smart technologies and other innovations. In this phase, city administrators increasingly focus on technological solutions as enablers to improve quality of life (*Dept Business, 2013*). For example, most leading smart cities such as Barcelona (Spain), has more than 20 'smart city' program areas and more than 100 active 'smart city' projects, from Wi-Fi in public spaces and public transit to intelligent lighting and the promotion of an electric-vehicle charging infrastructure (*Laurson, Lucas (2014)*).

The third phase is citizen co-creation. Here the citizens are made to be effective co-owners and co-creators of the smart cities. Thus, leading smart cities of the world are beginning to embrace citizen co-creation models for helping to drive the smarter cities development (*Viitanen and Kingston, 2014*). Vienna, for example, like Barcelona, also has more than 100 active 'smart city' projects. But some of those projects have a different feel. For example, in a partnership with the local energy company, (Wien Energy), Vienna included its citizens as investors in local solar plants as a contribution to the city's 2050 renewable energy objectives (*Gooch et al., 2015*). It has also had a strong focus on citizen engagement in addressing affordable housing and gender equality (*Gooch et al., 2015*). The third phase appears to be grounded more in the issues of equity and social inclusion as well. The emergence of 'sharing cities' is one example where cities are providing the enabling conditions to allow local sharing activities to emerge (*McLaren and Agyeman, 2015*).

2.3 Characteristics of Smart City

A smart city is an integrated system in which human and social capital interact, using technology-based solutions with the aim of efficiently achieving sustainable and resilient development and a high quality of life on the basis of a multi-stakeholder, municipality based partnership (Urban Tide, 2015). A smart city is a municipality that uses technology to increase operational efficiency, disseminate information to residents and visitors and improve the quality of government services (*Komninos, 2008; 2009*). The concept of smart cities is aimed to offer a set of infrastructure and new generation services with the support of Information and Communication Technologies (ICT) (*Hollands, 2008*). Theoretically, any area of city management can be incorporated into a smart city initiative, including such things as water usage, infrastructure design, emergency response and parking spot availability (*Eger, 2009*). For example, some city planners and managers in Europe are using sensor technology and advanced data analytic tools to monitor, analyze and optimize the way traffic flows on city streets and ensure that public transportation supply meets user demand (*Moser, 2016*).

The main innovations coming from the smart city concept are the rise of a user-centric approach that considers urban issues from the perspective of the citizen's needs, the engagement of citizens in the city functioning, or a truly holistic approach to urban challenges that becomes essential for Smart Strategies. This last innovative factor explains why the Smart City is a concept that surpasses earlier maybe similar ones that usually miss the holistic approach, focusing only on improving either human, technological or environmental factors (*Peris-Ortiz et. al., 2016*). ICT-based solutions are the key element that differentiates and confers potential to the smart city, however simply deploying expensive technologies in the city is a misunderstanding of the concept. The development of Smart Strategies must be run on the

basis of a multi-stakeholder municipally-based partnership. Bottom-up approaches are allowed to coexist with the more traditional top-down ones (Kominos, 2013). As observed by Paskaleva (2009) a city is referred to as 'smart' when it covers the aspects of smart homes, smart buildings, intelligent transportation, energy management, and security and sustainability among others, which are the ideal options for authorities and decision makers. Smart cities offer a set of infrastructure and new generation services with the support of Information and Communication Technologies (ICT) (European Commission, 2015).

2.4 Core Components of a Smart City

Basic Infrastructure: For a city to be considered smart, it must maintain efficient and uninterrupted supply of water and electricity, assured sanitation and solid waste management, efficient urban mobility and public transport, robust IT connectivity, e-governance and citizen participation, safety and security of citizens (Boyle et. al., 2013).

Smart Solutions: A smart city must ensure regular flow of information from the city managers and administrators to the public for effective citizens' engagement, there must be effective system of addressing grievances, service delivery is mostly done electronically, waste to energy and compost is prioritized, ensures 100% treatment of waste water, unrestricted access to smart meters and regular maintenance of the meters, monitoring water quality, renewable source of energy, efficient energy and green building, smart parking, intelligent traffic management system (Schaffers et. al., 2016; Carey, 2017).

Data democratization: This is a key component of the smart city concept. Advocates of smart city projects maintain that making large municipal data sets available to citizens will increase civic engagement and enable residents to develop new ways to use the data a city collects (Yovanof and Hazapis, 2009).

2.5 Benefits of Smart Cities

Smart cities have significant social, economic and environmental benefits. They make transportation more efficient, and thus increase labor productivity. More impressively, cities that invest in smart-grid technology and infrastructure, called "connected cities," experience an annual GDP growth rate that is 0.7 percent higher, an unemployment rate that is a full percentage point lower, and office occupancy rates 2.5 percent higher than less advanced cities. Smart infrastructure is cost-effective over a long-term.

1. A smart city equipped with basic infrastructure gives a decent quality of life, a clean and sustainable environment through application of some smart solutions.
2. A smart city strategy makes city services more effective and cities more attractive to investors, residents, visitors and the business community.
3. A smart city strategically manages multiple systems at a city-wide level and through increased transparency, openness and shared accountability creates an innovation system that improves outcomes and enhances city competitiveness.
4. Smart Cities are envisaged in the broad vision of sustainability as well. Hence, they try to protect the natural ecology of the area.
5. The concept helps the environment by reducing the amount of CO₂ emissions.
6. It aids people by saving the energy cost, making optimum utilization of natural resources effectively and efficiently.

7. There are technologies embedded with features that help identify problems at a very early stage, and subsequently improve the safety and security of people living in the cities

3.0 Challenges

The following concerns have been raised about smart city concept:

- Privacy Concerns for its Citizens: Smart city concept is based on acquisition of a lot of data about everything that is going on around an individual. The potential of this data is very huge and can reveal a lot of things about the individuals. Thus, there is the possibility that city managers may not keep data privacy top of mind and handle the huge amount of data that citizens produce on a daily basis sensitively (Townsend, 2013).
- Security and Safety Concerns: Once privacy aspects are compromised, there is a big threat to safety and security of individuals (Jong de et. al., 2015). The systems should therefore, be designed with multi-layer of security layer and security shouldn't really be easily available in the hands of bad elements.
- Cost of Living: The building and operation of smart city infrastructure require massive investment. These investments would be borne by the citizens, sometimes directly, but a lot of times indirectly - may be in terms of higher rate of taxes (Caragliu et. al., 2009).
- Awareness of Citizens: Nigeria has a relatively large number of digitally illiterate populations. When digital services are thrust upon digitally illiterate people, they are susceptible to a lot of self and system damage (Moir et. al., 2014). This issue needs to be addressed on priority.
- Battery Replacement and Charging Issues: Smart city is based on a large number of sensors and other internet devices spread across different places. Each of these devices and sensors operate with the help of battery. Though the design is done in such a way that there is no requirement for recharge or replacement of these batteries for a long time, however, whenever the replacement is required, it is likely to be very costly and tedious affair (Mohanty, 2016).
- While Smart Cities provide new opportunities, they definitely lead to people giving up their lands. Sometimes a project may displace people or communities. Above all, there are environmental repercussions for any construction project (Cavada, 2016).

Nigerian Cities and Smart Indicators

Smart Mobility: Road transport is the dominant transport mode in Nigerian urban centres. The only exception is Lagos that combines road, rail and water transport for urban passenger mobility. But despite the availability of other modes, road transport is still responsible for a substantial percentage of intra-urban commuting. This undoubtedly results in traffic gridlock along many primary and secondary arterial roads leading to longer travelling time of the commuters. Therefore, most Nigerian urban transport does not exhibit smart mobility.

Smart Governance: There are two levels of government in city administration in Nigeria – State and Local Governments. But the closest to the city dwellers is the Local Government. Just like the State Government, Local Governments emerge through popular election and serve for a fixed term. However, what obtains in many municipalities is the appointment of caretaker governments by their respective State Governors for a period determined by the Governors. This has made urban administration less participatory and consequently less transparent because the emerging city governments tend to owe allegiance to their appointers rather than the citizens. For instance, the last time local government elections were held in Oyo was 2007. Whenever, election is held, it is always fraught with irregularities leading to the ruling party in the

State winning all the local government councils. Also, it is hard to identify any city in Nigeria where participatory budgeting is practiced.

Smart Environment: Despite the growing adoption of solar and other renewable energy sources in many countries (Norway, Germany, Netherlands), Nigeria is yet to fully appreciate and adopt this environmental friendly energy sources. With exception of a few individuals, educational institutions (such as the University of Ibadan) and a few urban centres that used solar energy to power powered only their street lights (such as Offa in Kwara State, Koton Karfe in Kogi State), many cities and metropolitan areas are yet adopt this source. Also, in spite of the enormous potential to generate power through wind especially in the Northern part of Nigeria, no city seems to be exploring this source as well. Although, this may be attributed to the constitutional provision, that gives the Federal Government the exclusive right to generate and distribute electricity in Nigeria.

Smart People: There are about 380 ethnic nationalities in Nigeria (Wikipedia, 2018) and two dominant religions – Islam and Christianity. Most Nigerian cities are inhabited by people of different ethnic and religion backgrounds and none is neither mono-ethnic nor mono-religion. This makes Nigerian urban centres ethnically and socially diversified. For instance, in the Muslims dominated Hausa city of Kano (Northern Nigeria), about 2% of the inhabitants are Christians (Nigerian Bulletin) living and transacting business peacefully. Similarly, in the Christians dominated Igbo city of Enugu (South East Nigeria), about 9% of the inhabitants are Muslims (Osewa, 2018) living and transacting business peacefully. Furthermore, urban literacy level in Nigeria as at 2017 was put at 48% as against 40% in 2000. The establishment of the National Open University of Nigeria with its flexible distance learning programmes and the launching of part-time programmes by many Universities, Polytechnics and Colleges of education appear to be responsible for the rapid increase in the literacy level among urban dwellers in Nigeria.

Smart Living: Available data point to low quality of life in most Nigerian urban centres. Quality of life is the general well-being of individuals and societies in relation to life satisfaction, including everything from physical health, family, education, employment, wealth, safety, security, freedom, religious beliefs, finance and the environment (Barcaccia, 2013). As noted earlier, many cities lack adequate infrastructural facilities which facilitate better quality of life. In addition, due to the not too buoyant urban economy, a substantial percentage of urban dwellers do not have access to gainful employment.

Smart Economy: Nigerian cities lack sufficient initiators of innovative manufacturing ideas because of the trepidation of potential entrepreneurs to invest in developing and executing manufacturing ideas. This situation is influenced by a number of factors which include: poor infrastructural development; weak technological base; frequent changes of economic policies; narrow domestic market for products; mass importation of foreign goods; and institutional obstacles.

From the foregoing discussions, it is obvious that no Nigerian city exhibits all the smart attributes. 'Smart people' appears to be the only discernible attribute of most cities. This calls for consistent and sustained efforts to adopt and fully implement the Smart City concept for cities' livability and equitable distribution of the cities' resources.

4.0 Conclusion

Between 2015 and 2050, the number of people living in cities in Nigeria is expected to grow from around 66 million to around 230million (UN, 2017). The obvious result of the continuous rise in the number of urban dwellers is rapid urbanization and expansion of the deprived neighbourhoods due to the limitation in the resources available to the urban managers. Towards the end, it is important to understand that to have better, livable and inclusive cities where every

References

- Ademiluyi, I. A (2010) Public housing delivery strategies in Nigeria: A historical perspective of policies and programmes. *Journal of Sustainable Development in Africa*. 12(6):153-161.
- Afolayan, A. A. (1978) Population. In Oguntoyinbo, J. S., Areola, O. O. and Filani, M. O. (Eds.) *A Geography of Nigerian Development*. Ibadan: Heinemann Educational Books, Pp. 113 – 123.
- Agbola, T. (1998) The housing of Nigerians: A review of policy development and implementation. DPC, Ibadan.
- Akinmoladun, O. I. and Oluwoye, J. (2007) An assessment of why the problems of housing shortages persist in developing countries: A case of study of Lagos metropolis, Nigeria. *Pakistan Journal of Social Science* 4(4): 589-598.
- ArturBorcuch and Magdalena Piłat-Borcuch (2016) The importance of selected factors in smart city development: the student's perspective. *International Journal of Applied Research*, 6(1):604-611.
- Bako A. I., Raheem, W. M., and Abdulyekeen, A. O. (2017). Land. In L. Egunjobi (Ed.), *Contemporary Concepts in Physical Planning* (Vol. 3, pp. 581-600). Ibadan: Department of Urban and Regional Planning, University of Ibadan, Ibadan, Nigeria
- Bako, A.I. (2012), Gender Access and Legal Security of Tenure to Residential Land in Lagos Metropolis, Nigeria. A PhD Thesis; Federal University of Technology, Akure, pp241
- Barcaccia, Barbara (2013). "Quality Of Life: Everyone Wants It, But What Is It?". *Forbes/ Education*.
- Barona, P. C., Murphy, T., Kienberger, S. and Blaschke, T. (2015) A multi-criteria spatial deprivation index to support health inequality analyses. *International Journal of Health Geographics* 14(11).
- Batty, M. (2012) Smart Cities of the future. UCL Working Paper Series, Paper 188.
- Boyle, D., Yates, D., Yeatman, E. (2013) *Urban sensor data streams: London 2013*. *Internet Computing*, 17(6): 1.
- Caragliu, A, Del Bo, C., Nijkamp, P (2009) *Smart cities in Europe*. Serie Research Memoranda 0048. VU University Amsterdam, Faculty of Economics, Business Administration and Econometrics.
- Caragliu, A., del Bo, C., Nijkamp, P. (2009) Smart cities in Europe. In: 3rd Central European
- Carey, Liz (2017) EEl chairman pledges to collaborate with communities on powering technology to support smart cities. *Daily Energy Insider*, 10(1): 10– 13.
- Cavada, M. (2016) Do smart cities realise their potential for lower carbon dioxide emissions? Available at <http://www.icevirtuallibrary.com/doi/abs/10.1680/jensu>. Accessed on 25 March, 2018.
- CIA. 2017. The world factbook. Central Intelligence Agency (USA). Available at: <https://www.cia.gov/library/publications/the-world-factbook/fields>. Accessed on 20 December 2017.
- Correia, L.M. (2011) Smart cities applications and requirements, White Paper.NetWorks European Technology Platform.
- Deakin, Mark (2013) *From intelligent to smart cities*. In Deakin, Mark (Ed.) *Smart Cities: Governing, Modelling and Analysing the Transition*. London: Taylor and Francis. p.15.
- Dept. Business (2013) *Smart cities - Background paper*. UK Government *Department for Business, Innovation and Skills*.
- Eger, John M. (2009) *Smart growth, smart cities, and the crisis at the pump a worldwide phenomenon*. *Journal of E-Government Policy and Regulation*, 32(1): 47-53.
- EU (2010) *Directive 2010/40/EU Of The European Parliament And Of The Council Of 7 July 2010*. eur-lex.europa.eu
- EU (2011) *Cities of tomorrow: Challenges, visions, ways forward*. European Commission,