SMART CITIES AND SOCIO-ECONOMIC DEVELOPMENT IN NIGERIA: EVIDENCE FROM SOME SELECTED COUNTRIES

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Abstract
The rate at which cities are growing over decades with unprecedented increase in the use of utilities such as water, energy, education, housing, sanitation etc. calls for concern. The unprecedented population growth has led to the agitation for smart cities where little efforts will be utilized to achieve maximum output. However, the government of Nigeria has put in place some measures to achieving smart city concept that will assist the citizens to live better life that will lead to a robust socio-economic, despite this feat the country has not explored the concept maximally to increase better living that will engender a robust socio-economic development. Sequel to this background that this study examines the role plays by smart cities in ensuring socio-economic development in Nigeria. The secondary data used in this study was gathered from existing publications. Being a qualitative research, content analysis was employed in the interpretation of the data. It was revealed that smart city arrangement in Nigeria is poor, hence this affect socio-economic activities most especially in the areas of trade and commerce, education, security, health to mention but a few. The study therefore recommends that

government should encourage private sector through public private partnership to achieve this feat.

Keywords: *smart cities; Nigeria; government; socio-economic; development; education.*

JEL Classification: O18

Introduction

Digital technology concepts have gone through different strata which are digital cities to intelligent cities and now smart cities. Smart city depends on digital or automated infrastructural facilities to building robotic transportation systems, hospital, schools, roads etc. Under the smart city arrangement, there is sophistication in terms of infrastructural facilities provided that assist the citizens to interact with one another through digital technology. According to Musa (2017) A city's infrastructure comprise complex systems, such as sewage treatment plants, water treatment plants, police stations, fire departments, utility services, schools, libraries, business, houses coupled with an urban complex infrastructure that help citizens' interaction and technological integration of the city's infrastructure. Technology helps to achieving city-officials interaction with the community and the city's infrastructure through real-time control systems, sensors, and collection of data from citizens (Poslad, Athen, Zhenchen, & Haibo, 2015).

Smart city adopts intelligent urban system to enhance socio-economic development so as to achieve unprecedented economic growth and development in the country. According to Musa (2017) data collection is key to ensure efficiency, which leads to optimization of the systems. A smart city provides technological solutions to city problems and increase better quality of life.

Smart city enhances the socio-economic activities such as reduction of grid lock, interaction over the smart devices to conduct businesses and engender harmonious environment due to sophistication of digital technology.

The world statement policy of 2010 in Shanghai: Better city, better life is a reflection of the importance giving to the smart cities in playing crucial roles to achieving sustainable socio-economic development. According to United Nation (2011) Shanghai declaration of October 31, 2010 highlights the importance of establishing cities of harmony where residents will domicile harmoniously with minimum efforts put in place to achieving maximum output. The importance of

Socio-economic development to any country cannot be over-emphasized as it increases the standard living of the citizens. Socio-Economic development causes improvement and change in the activities of a society with resultant consequence on changes in economics enhancement and reduction in the level of poverty that affects the citizens. Socio-economic development means the improvement of people's lifestyles through improved education living standard of people and employment. It is the process of economic and social transformation based on environmental factors which include increase in the use of internet to advance day to day activities. Socio-economic development, therefore, is the process of social and economic development in a society but in Nigeria infrastructure and other ingredients of socio-economic development such as electricity, good road network, telecommunication, education and awareness are not adequate which is the reason smart city arrangement has not gained popularity to advance socio-economic activities in many cities. Infrastructural deficit manifest globally and identified as one of the major determinants of adequate and good urban settlement (Aigbokan, 1999; Otegbulu, 2011; UN-Habitat, 2015, 2015). Urban problem is the horizontal growth of a city's physical structures which present growth patterns that manifest major urban problems in both developed and developing countries (Adetokunbo & Emeka, 2015).

However, in Nigeria, most especially cities such as Abuja, Lagos, Ibadan, Kano, Port Harcourt etc. embrace the arrangement of smart city to conduct socio-economic activities but the arrangement is not enough as there are many places in the country that digital technology is lacking due to lack of infrastructure and unstable policy of the government. Many offices and cities in Nigeria have not keyed into this smart city arrangement properly to advance socio-economic activities. For instance, many cities are still adopting traditional system to control traffic. Also many places in Nigeria have not grown to the level where sophisticated digital technology are used to advance socio-economic activities in the areas of security, adequate generation of data for research etc. For instance anti-social behaviours committed on the streets cannot be tracked without security agents being present at the scene of the crime. Also in Nigeria, insurgency, criminal herdsmen have been difficult to arrest and decimate due to lack of sophisticated digital infrastructures that can track and expose them which is a direct opposite of what is happening in developed countries. For example in United States of America (USA) if the crime is committed anywhere the perpetrator finds it difficult to escape arrest because of high impact technology. Adeyeye (2010)opined that the

current metropolitan growth in Nigeria manifest urban sprawl and traditional settlement that stimulate scattered population growth in which the available technology to improve these challenges are insufficient. Illegal structures, slum development, and informal settlements are the major characteristic of the Nigeria metropolis and other developing countries. Loss of life and property, urban insecurity, traditional settlement and slum developments are the physical characteristic of Nigerian metropolis (ARUP, 2014; Solis, 2012 quoted in Soyinka, Siu, Lawanson and Adeniji 2016). Unstable political economy in Nigeria has made many cities in the country to experience stagnancy as they are physically developed (structure) without increase in status. Apart from the Wi-Fi in Wuse Market provided by Google Station and Millenium Park, Abuja there are no other public places and facilities like library, market and building with internet provision in most cities (Ogunfuwa quoted in Oyedele, N.D).

However, many authors have written on the artificial intelligence, smart city, but there are few study on smart city and socio-economic development in Nigeria where evidences are drawn from Western Countries. It is against this backdrop that this study seeks to examine the role plays by smart cities in enhancing socio-economic development of Nigeria and to draw evidences from Korea, Canada, Japan and Denmarkin order to improve Nigeria smart city arrangement.

Review of Literatures

Literatures on smart cities and socio-economic development are reviewed empirically so as to bring out the views of the scholars on the subject matter.

Abdoullaev (2011) identified smart city as an urban settlement manifesting intelligent information systems, technology embedded infrastructure, transport systems, utilities, energy networks as provision for social infrastructures and good governance for its citizens.

According to Rode (2017) smart city concept has been in existence since the 90's, then it focused on ecology and urban development but the in 2008, there was a shift in paradigm in which the word smart is used in the context of digital technology even till today.

Soyinka et al (2016) the smart infrastructure in Lagos can be adopted by developing blueprints that identify strategic areas for the redevelopment and integration of smart infrastructure concepts. Connectivity through technology mapping and linkages for adequate functionality should also be provided. The blueprints must be designed to manifest harmonious land uses within the same

vicinity and develop the synergy with the public facilities such as schools, grocery stores and recreational facilities within these areas to advance sustainable residential areas. The land use development that accommodates smart and community infrastructures and its integration within the existing built-up areas of Lagos metropolis should be ensured. The infrastructures, public services, and building infrastructures should be integrated within existing vacant areas of Lagos via spot clearances. A practical example of such integrations with smart infrastructure concepts that should be encouraged includes the Shoprite at Ikeja and the jetty transport in Badore area of Eti-Osa LGA, but this integration should provide adequate technology and smart infrastructure concept.

Woherem and Odedra-Straub (2017) the establishment of a smart city is a journey completely dependent on the maturity status of each individual city and the availability of basic infrastructure, funding and skills. The study therefore recommends that tech-savry young population in combination with public private partnership (PPP), venture capital, tech hubs will be able to come up with smart applications that will make life a little easier and make government notice the mess their city dwellers have to survive in.

Shichiyakh, Klyuchnikov, Balashova, Novoselov, Novosyolova (2016) "smart city" is used throughout the world with a variety of contexts and has all sorts of practical aspects often 'smart city' referred to the use of information technologies in the urban environment and the life of citizens.

Musa (2017) indicated that smart city initiatives contribute directly and indirectly to the economic growth.

Ajala (2018) the application of the concept in Nigeria will be limited by the level of ICT infrastructure, absent of a national policy guideline and poor investment in transport infrastructure. The development of a national policy guideline for integrated transport development; establishment of a city structure that will coordinate and promoted investment with innovative funding that will support ICT- infrastructure in the transport sector.

Akujobi, Nwakanma and Ekeocha (2017) the growing model of smart urban housing patterns and street linkages, ability of security institutions to receive information on crime and enforce rapid response and smart intelligence gathering, revamping of old metering system to smart metering of electricity, water and other social services being provided by the Nigerian government remains a huge clog to actualization of the smart city initiatives. There should be synergies and review of developmental policies in Nigeria that will engender sustainable smartness that will help to enhance values.

According to Miller (2016) application of the smart infrastructure include the use of real-time information and the integration of urban system, multi-modal transport networks that are effective, efficient equitable movement of the people, goods, and services in a more social, environmental, and physically sustainable areas over a long period of time. It also includes the integration of all real-time information and activities with a viable effective digital technology to advance socio-economic activities.

An insight into the level of Nigerian Cities Development.

Nigerian cities such as Lagos, Abuja, Kano, Port Harcourt etc. are densely populated most especially Lagos and Kano State owing to rural-urban migration occasioned by the development of those cities. According to Oyedele (N.D) urban growth is enhanced by the emergence of local governments in the country with their corresponding headquarters experiencing major growth. Nigeria has 774 official local governments. The growth of these cities was further enhanced with the availability of revenue which afforded the local governments the opportunity to improve on infrastructures. The growth of these cities however has experienced poor road network, poor transportation, grid lock etc. caused by lack of proper planning. Supporting this view is Woherem et al (2017) African cities are haphazardly structured with poor infrastructure and poor service delivery. Salau quoted in Yakubu (2018) observes that Nigerian census conducted in 1952 regarded urban center as an area with the population of more than 5000 people. In contrast, the 1963 census was fixed at 20,000 people. Salau stressed that the economy of Nigeria in which urbanization has begun from was stagnant coupled with lower growth of industrialization which has a grave implication on unemployment, human and food insecurity etc. Oyeleye in Yakubu (2018) stresses that the 1970 oil boom and the operation of Ports in some parts of the country coupled with massive infrastructural development in the cities led to uncontrolled rural-urban migration with a view to have better life. The urban development plans in Nigeria 1960-1966focused its development plan on economic planning rather than aiming at resolving physical planning challenges. The second National Development Plan 1970-1974 was formulated to develop war ravaged Eastern parts of the country. The 1975-1980 plan brought a great relief by including certain policies that focused on environmental and rural development occasioned by the establishment of Federal Ministry of Housing, Urban Development and Environment. The greatest contribution of the Federal Government to Urban and Regional Planning was the

institutionalization of the concept of new towns which led to the emergence of Abuja, Onne, Satellite town and FESTAC town. It is important to note that outside the present Abuja City and the then celebrated FESTAC town are deteriorating due to lack of political will to sustain the policy thrust with the exception of Abuja that assumes smartness due to bias and political economy of national development in Nigeria. Also, World Bank made in-roads into the states for urban development programmes with site and services projects in Bauchi and Imo states that are struggling to development due to their current level of socio-economic and political development that failed to adopt smart digital technology in urban governance. In addition the fourth National Development Plan clearly stated the objective of Urban and Regional Planning by defining the role of physical planning as a mechanism to achieving national development objectives as well as putting forward some policy measures that were of planning interest (Adebayo, 1999). From 1999 to date Nigeria has adopted a number of strategies for national development and management which included National Economic Empowerment and Development Strategy (NEEDS) in 2003 that was domesticated in the State and Local Government. National Urban Development Policy (NUDP) in 2009 was charged with the responsibility of developing a dynamic system of urban settlements which will promote economic growth, promote efficient urban and regional development and ensure improvement in the standard of living of all Nigerians by (i) Restructuring all existing public institutions involved in urban management at the three tiers of Government and where necessary create new ones with a view to ensuring effective responses to the challenges of urbanization in Nigeria. (ii) Prepared regional, master plans, and development plans for all designated urban centers and growth centers within the context of National Physical Development Plan (iii) Integrate the urban development policy into the national economic policies of government (Akujobi, Nwakanma, and Ekeocha, 2017). Nevertheless, the herculean efforts are being made by the government and the private sector to advance the smart concept in Nigeria but the effort is still at the minimum level due to the level of infrastructure and government inconsistent policies. The emergence of sophisticated digital technology in Nigeria has not caused increase in the smart city arrangement that will lead to increase in socio-economic activities. Bansal, Shrivastava, & Singh; Belanche, Casaló, & Orús, quoted in Soyinka et al (2016) identified poverty, environmental pollution, infrastructure deficit and ineffective urban services etc. as challenges that mitigate against smart infrastructure development. (Bansal, Shrivastava, & Singh quoted in

Soyinka et al 2016) identifies six basic elements of smart infrastructure as benchmark for smart city classifications that will lead to socio-economic development to include; 1, the sources of renewable energy like wind energy, thermal power energy, solar energy etc., 2, smart grid for smarter city, 3, smart physical planning/land use morphology, such as compact city with mix land uses, diverse transportation choices, 4, smart eco-friendly environment, 5, intelligent cities, smart transportation, and 6, ICT as the major factors.

Concept of Nigeria Smart City Initiative

The Nigeria Smart City Summit gave birth to The Nigeria Smart City Initiative acronym NSCI was held in Abuja, Nigeria on 8th August, 2017 under the auspices of the Federal Ministry of Communication in collaboration with AFRITEX Initiative. The summit emphasized on how to launch viable strategies that will transform Nigerian cities from their informal settlements to modern and responsive cities that is capable of meeting the needs and aspirations of the citizens presently and in the future. The plans of NSCI was to heavily rely on application of ICT and smart technologies in the administration, development and management of Nigerian cities so as to achieve effective transport sector, secured environment, decent affordable housing, efficient sanitary and waste disposal system, urban regeneration and upgrade in the cities. The Initiative intends to capture more than 50 percent of all Nigerian cities. (National Information Technology Development Agency, NITDA). The Federal Government of Nigeria (FGN) is showing commitment to the provision of infrastructures and application of smart concepts that will assist to transform urban areas into functional and responsive cities that are capable of meeting the needs of the city dwellers in order to achieve socio-economic development.

The reliance on ICT for national physical development planning will give country a facelift to become technology hub of African sub region. The government of Nigeria put in place many programmes and policy guidelines that gave impetus to the successful implementation of the NSCI. The Ministries, Departments and Agencies at the Federal, States, Local Government Areas, private sector participants, professional associations and NGOs keyed in into this arrangement. It became mandatory for all MDAs in the country to embrace e-governance in the conduct of their statutory functions. Also, government e-learning platform for public servants Public Service Learning Management System (PSLMS) which aim at building smart public servants for the country was initiated. More so, this

arrangement gave birth to the Government Integrated Financial Management Information System (GIFMIS), Treasury Single Accounts (TSA), Integrated Payroll and Personnel Information System (IPPIS) e-payment system and the effort towards cashless economy thereby enhancing the economic capacity and growth potentialities of the cities and the urban centres. The Nigeria ICT Roadmap covered 2017 to 2020 which aimed at transforming the Nigerian economic, social, political and interactive environment to be fully ICT compliant and information driven by the year 2020 (Mansur, 2019).

Strategies Adopted by the Governmentto Promote Smart City

In order to advance the smart city arrangement, various strategies are put in place which include the following

National Board for Technology Incubation (NBTI) is technology Hubs that is government-based support programme with a view to assisting the entrepreneurs to develop technology based firms with ten technology incubation centres spread across the Nigeria. There are more than 50 registered technology hubs for training millions of young Nigerian entrepreneurs in ICT and computer applications, programming, analytics etc.

Nigerian Digital Literacy Council was established developing guidelines and standards for the actualization and improving the digital literacy of Nigerians so as to be relevant in the global information driven environment.

National Information Technology Agency (NITDA) is the agency charged with the responsibility of enforcing compliance with Public Information Access (PIA) protocol.

PIA is saddled with the responsibility of overseeing the provision of internet services in public places or in the areas where the public have unrestricted access. The government plans to provide free internet service in many public areas in the country.

Also, there are many technology based institutions charged with the responsibility of training Nigerians on the digital technology which include Africa Regional Institute for Geospatial Information Science and Technology AFRIGIST, National Space Research and Development Agency (NSRDA), Federal School of Surveying FSS, Universities and Polytechnics teaching courses on capacity building that is needed for the realization of Smart Cities arrangement.

The government continues to show commitment on GNSS infrastructures such as CORS and earth observation satellites. Many active CORS network are

strategically located in the country, streaming data to providers and users of spatial information in the country. Data from the 2.5 meter resolution EOS Nigeria Sat – 2 has been sufficient for supervising and monitoring of many physical development sectors.

Private participation in the provision of enabling environment for the growth of Smart City. In 2013Google Maps introduced turn – by- turn navigation for subscribers of Google Map for

Mobile. Real traffic updates was introduced in 2015 so as to help commuters navigate busy traffic conditions and in July 2017 Google Map debut Street View in Nigeria for over 10,000kilometres of road networks particularly in Lagos. The project is being extended to many urban centres in the country (Mansur, 2019).

Insight into Smart City in Nigeria.

The former Governor of Lagos State Akinwunmi Ambode announce at the Conference tagged Lagos at 50 in May 2017 which is themed 'Towards a Smart City: Preparing for the next 50 years of prosperity' with keynote being delivered by the Oxford Professor, Paul Collier. Lagos State is the commercial capital of Nigeria with more than 20 million inhabitants. It is a City with great potentials, it has a Gross Domestic Product (GDP) of about US$136bn in 2017. According to Africa Business Insight (ABI) (2017) Lagos economy is adjudged to contribute immensely to the growth of Nigerian economy and earns the highest annual tax revenue of all States in the country and the Federal Capital Territory. The technological advancement in Lagos has helped in bringing out the potentials of the city through Savvy entrepreneur that built the Computer Village where information and communication technology (ICT) can be found. According to ABI (2017) Computer Village in Lagos is adjudged the largest ICT accessory market in Africa. In order to make Lagos artificial intelligent city, the government installed free Wi-Fi connectivity in the new Bus Rapid Transist (BRT), Ndubuisi Kanu Park in Alausa, Ikeja City Shopping Mall. Also the government has upgraded Lagos Enterprise Geographic Information System which adopt technology in monitoring and evaluating of public infrastructure, improve government citizen relationship inter alia. More so, there has been installation of information highway metro fiber and 4G LTE networks across the State to facilitate e-services such as e-health, e-agriculture etc. Also the former governor of Lagos Akinwunmi Ambode announced plan to transform Yaba into a major technology hub. The smart city is being built in Ibeju Lekki on the outskirts of Lagos. Apart from the smart city Lagos which has got to the advanced stages, Eko Atlantic City has also begun, which is created from

sand-filled area of Atlantic Ocean in Victoria Island. The Lagos Smart City is a project by the State Government with a cluster of offices and residential buildings for ICT business. Another Smart City innovation technology is located in Lekki-Epe Expressway which will provide physical and ICT infrastructure, energy to the country. Another Smart City initiative is currently going through on Lekki-Epe Expressway with $300million initiated by Imperial International Business City (IIBC) and promoted by one of the royal families in Lagos. This project is expected to be completed by 2021 with its potential to creating eco-friendly smart business city (ABI, 2017). The diagram below shows the level of artificial intelligent in Lagos State of Nigeria. This has been evident as laudable project have been embarked upon as part of her city smartness revolution which include the construction of the Eko Atlantic city, activation of toll-free emergency services, city heritage MOU it signed with Dubai and free Wi-Fi in public parks and the ongoing construction of 10 lane light project along Lagos- Badagry express way, etc (Adegoriola, Akinwande and Muraina, N.D).

The picture below is adopted from Africa Business Insight (2017).

Contributions of Smart City Concept to the Development of Nigeria

Nigeria has a significant number of people that have access to internet facilities to interact with their environment and world at large. In Nigeria smart city technology is used to perform the following functions-

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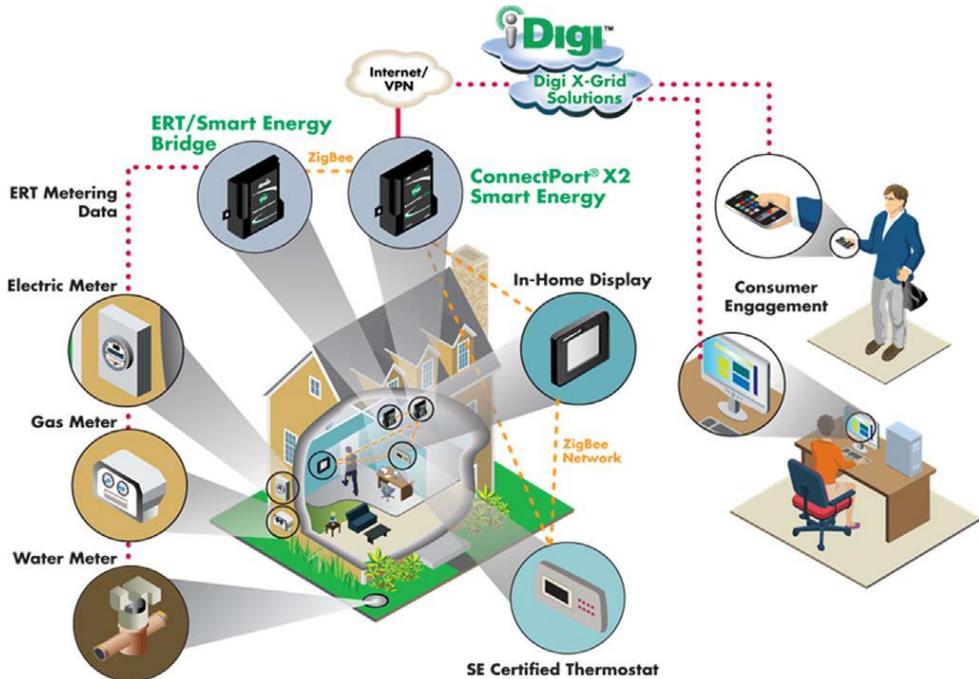
Source: Adopted from Soyinka et al (2016)

1.Banking – this type of technology has been adopted by the commercial banks in the country in order to facilitate good number of transactions outside the banking hall and beyond banking hours. The services include collection of money, buying of recharge cards, transfer of money to another bank etc. through Automated Teller Machine (ATM)

2. E-Services-most of the applications such as jobs, company registration, tax payment, educational registrations are done electronically. Take for instance, students pay their registration fees through automation and this has saved the students the trouble of wasting time in the Bank. In Ahmadu Bello University most services are rendered through automation which include payment of hostel fees.

3. E-Transportation- there have been emergence of commercial cars, and bikes called Uber that operate through internet to convey their passengers from one place to another. Smart bus is another area where Lagos State made impact through Bus

Rapid Transit (BRT) which provides internet services to the passengers on board. According to Adegoriola et al (N.D) the mode of transportation in the state is mainly by road with 90% of total passengers and goods moved through this means. The state is endowed with natural water ways for ferry services and federal rail network which will be complemented by the emerging state rail network. The demand for trips in the Lagos megacity region by all modes (including walking) was estimated at 22 million per day with walk trips accounting for 40% of total trips in metropolitan Lagos.

4. E-Commerce-Nigerians have adopted transaction of goods and services over the internet. This can be seen as re-inventing the government explained by Gaebler and Osborne in the evolution of Public Administration in the 1990 and beyond. In Nigeria goods and services are transacted through platforms such as JiJi, Jumia, Konga etc. over the internet'. According to Mansur (2019) Smart cities support national economy by creating new businesses and customers. Smart traffic navigation, goods and vehicles tracking systems, intelligent traffic management, automatic ticketing systems, smart parking etc. generate wealth, increase government revenue, save man hours and improved the quality of lives of citizens. A study conducted by a research group Alpha Beta (supported by Google) and presented in October 2017 on Economic Impact of Geospatial Services in Nigeria indicated that digital maps reduced travel time of Nigerians by about 8% and saves over Naira 190b annually. The study found, value digital maps at an average of N22, 131 per year per user which translates to N1781billion per year for all users in the country.

5. Smart Houses- in a bid to increase socio-economic development of Nigeria and make people live a good life, many smart cities arrangements have begun in Lagos which include Eko Atlantic City in Victoria Island.

Challenges of Smart Cities in Nigeria

1.Lack of basic infrastructure: inaccessibility to basic infrastructure such as electricity and piped water, education etc in urban cities in developing countries will make smart city concept difficult due to lower access to communication technologies, access to the digital education and skills needed to initiate and improve this concept will be a major challenge. According to Apashile (2019) "There is clearly access to basic services such as electricity and piped water in urban cities in developing countries. However much of the population have lower access the communication technologies. Access to the digital education and skills needs to be improved. This a major challenge when planning smart city projects"

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2. Problem of inclusion- This is a fundamental issue that has to be addressed if smart cities are to be adopted. Since the success of smart cities lie among the populace that have access to the internet connections, but in Nigeria the cost of internet connectivity is high therefore not everybody can afford the price. According to Yakubu (2018) the gap between the rich and the poor in terms of wealth and social status pose a challenge to the development of smart cities as it relates to digital inclusion

3. Environmental problem- Most of the Nigeria cities are not planned, houses are built haphazardly coupled with bad drainage system. There are no good roads network and the streets in most cities do not comply with the town planning arrangement. These problems constitute impediment to smart city concept. According to Soyinka et al (2016) the environmental situation of Ikeja and Eti-Osa Local government manifest slow development with peculiar growth challenges, transport challenges, slum, inadequate infrastructure, dispersed and uncoordinated infrastructure. Assessing the environmental condition of Ikeja and Eti-Osa LGA shows a critically challenged sprawl settlement. The environmental conditions of the study area is a sprawl development manifesting environmental challenges such as bad drainage with flooded areas, bad roads with several potholes and traffic challenges, littered dirt, haphazard building arrangement, and inadequate environmental conditions.

Evidences of Smart City Concept in some selected Countries

In order to improve the lives of the people and socio-economic development, many cities in Europe take advantage of smart city arrangement with the adoption of smart lighting, use of technology to enhance gridlock, Wi-fi access points, use of smart phones and appliances, smart grid technologies etc. Below are the cities in Europe where smart city arrangements are adopted.

Korea: Smart cities concept in Korea includes four main pillars which are research and development; the Smart Solution Challenge; deregulation and national pilot programme purposely for smart cities. The feat recorded on smart city initiative can be attributed to the high level of smartphones usage (95% of Koreans use a mobile phone), compact urban development and the development of the IT industrial ecosystem. Also, the emergence of local governments' initiatives, the creation of dedicated smart city teams within local administrations, citizen engagement and rapid corporate growth have been responsible to the success of the smart city initiative. Korea faces three main concerns: privacy; the smart divide;

and cost. Korea is addressing the smart divide through public CCTV networks and integrated social services. For example, SK Telecom and the Korea Land and Housing Corporation (LH) work together to equip the elderly with a speaker that recognises their voice and provides them with information, entertainment and company.

Japan: sees smart cities as "a sustainable city or region with the use of ICT and other new technologies to solving various challenges she encounters and manages herself so as to achieve overall effectiveness. Also, in 2019, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) supported 15 'Leading Model Projects' and 23 'Prioritised Projects for Implementation that are based on consortia with the private sector and local governments to solving urban and regional challenges via new technologies and data. MLIT and other ministries responsible for 71 consortia which have sufficient capability will support them through a public-private council. The idea behind these projects is to galvanise the cities to take their own initiatives and respond to the challenges of the places that have been left behind.

The Smart Cities concept in **Canada** brought about a competition amongst the local, regional governments and indigenous communities, with the objective of stimulating the communities to adopt a smart city approach in order to improve the lives of their residents through innovation, data and connected technology. This competition was initiated to engage all communities, including rural and remote communities that have little or no access to the internet. The Challenge offers four prizes up to CAD 50 million, which are open to all communities irrespective of their population size. To ensure that all communities participate, the government put in place a series of incentives to assist the small cities build up capacity and develop their proposals. In total, the government received 130 applications covering a wide range of solutions in areas such as food security, reducing isolation of the senior population, integration of migrants, and accessibility for people with disabilities. One of the main aspects of the competition is that all ideas have to be shared and be applicable to other communities.

Denmark: The Ministry of Transport, Building, and Housing and the Danish Business Authority consider "Smart City" as an evolving concept: At the beginning, the concept limited to governmental issues especially in the area of environmental, energy and infrastructure on how information and communication technologies can improve urban functionality. Later, all other areas of welfare keyed into the Smart City concept, for example in business development,

innovation, citizen involvement, culture, healthcare and social services, the use of data and digital platforms assist the smart initiatives (OECD, 2020).

The Prototype of Smart City Technology.

The diagram below shows different arrangement that are combined together to achieving smart city

It is found out that smart city initiative requires the maturity of the leadership and availabilities of basic infrastructure, funding and skills that will enable the people to interact with their environment effectively

The study also reveals that smart city arrangement will help to enhance socio-economic development. Through these initiatives many business outfit will rise which will stimulate the economy to achieve rapid growth. Supporting this view is Musa (2017).

The study found out that through smart city initiative, over utilization of infrastructural facilities will be reduced, security institutions will be enhanced

which reduce criminal activities to the barest minimal, and grid lock will be reduced. Supporting this view is Akujobi et al (2017).

It will increase access to the database making research interesting and more reliable coupled with availability of information on the crime and history of the criminals.

Conclusion and Recommendations

The adoption of smart city initiatives in most cities of the world and its enormous advantages have been an eye opener to many cities in Africa, Asia and Latin America. Also various researches conducted have proved that the adoption of smart city technology will not only reduce crime rate but will improve commerce and trade, education, governance etc. that will have positive impact on multiplier effect, hence this will increase the economic growth coupled with adoption of robust cultural, political, social and economic structural model that will further lead to socio-economic development. The study therefore recommends that government should intensify efforts by providing infrastructural facilities and linkages in form of high level technology that will stimulate private sector to continue to contribute more quotas to the development of smart city initiatives through Public Private Partnership arrangement (PPP).

Government should provide high level technology that will make the differentiations to be integrated effectively and efficiently which will reduce crime, grid lock, improve waste management, and revamp education and health sectors.

References

[1] African Business Insight (2017) Smart Lagos: Status, Prospect and Opportunities. www.howwemadeitinafrica.com.

[2] Ajala, A.T (2018) Conceptualizing Smart City for the Development of Nigeria's Urban Transportation. *Advances in Multidisciplinary and Scientific Research 4(2) 66-72*

[3] Akujobi, C.T; Nwakanma, U.E and Ekeocha, O.E (2017) Role of Smart City in Sustaining Urban Development in Nigeria. *Journal of Applied Science and Development 8(1) 18-42*

[4] Allen, P.M (1995) Cities and Regions as Evolutionary Complex Systems. *Published in Geographical System 4,103-130*

[5] *Azkuna I (2012)* Smart Cities Study*: International study on the Situation of ICT, Innovation and Knowledge in Cities.* Retrieved from the Committee of Digital and Knowledge-based Cities

[6] Batty,M (2010) Environment and Planning B: Planning and Design, 39, 191-193

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[7]   Harrison, C and Donnelly I.A (ND) A Theory of Smart Cities. *Proceedings of the 55th Annual Meeting of ISS, 55(1)*

[8]   Mansur, K. M (2019). Nigeria Smart City Initiatives (Nsci) the Geospatial Perspectives**.** Nigeria Smart City Initiatives (NSCI). *The Geospatial Perspectives (9946).* FIG Working Geospatial information for a smarter life and environmental resilience. Hanoi, Vietnam, April 22–26.

[9]   Matin J, Simon J; Daan, S; Changjie Z; Margot W (2015) Low Carbon-Eco-Knowledge Cities: Making Sense of a Multitude of Concepts Promoting Sustainable Urbanization. *Journal of Cleaner Production*

[10] Musa, W (2017) Impact of Smart City Initiatives on Cities' Local Economic Development. *A Published Thesis presented to the Graduate Faculty of the Fort Hays State University* in partial fulfillment of the requirement for the degree of Master of Labral Studies

[11] OECD (2020). Smart City and Inclusive Growth

[12] *Portugali, J (2000) Self-Organization and Cities.* Springer Verlag, Heidelberg

[13] Rode, P. (2017) accessed 21 July 2021. Available at: http://www.lse.ac.uk/lse-cities/People/philipp-rode/Philipp-Rode?from_serp=1

[14] Shichiyakh, R.A; Klyuchnikov, D.A; Balashova S.P; Novoselov, S.A and Novosyolova, N.N (2016) Smart City as the Basic Construct of the Socio-Economic Development of Territories. *International Journal of Economics and Financial Issues 6(SI) 157-162*

[15] Soyinka, O: Siu, K.W.M: Lawanson T and Adeniji, O (2016). Assessing smart infrastructure for sustainable urban development in the Lagos metropolis. *Journal of Urban Management 5*, 52-64.

[16] *United Nations (2011) World Urbanization Prospects; the 2011 revision highlights.* ESA/P/WP/224, Department of Economic and Social Affairs Populations Division, United Nation, New York.

[17] Woherem E.E; Odedra-Straub, M (2017) Potentials and Challenges of Developing Smart Cities in Africa. *Circulation in Computer Science 2(4) 27-39*

[18] Yakubu, K.N (2018) *Prospect and Challenges of Smart City Development in Nigeria.* Research Gate

[19] Adebayo, A. A. (1999): Climate II: Rainfall in: Adebayo, A. A. and Tukur, A. L. (Eds), State in Maps, Department of Geography Federal University of Yola and Paraclete publishers. 23-26