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Urbanization and Security in Africa: A Technological Perspective

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Abstract : *Urbanization as a phenomenon has been evolving since man began his existence on planet earth. It has evolved from hamlets of the primitive era of civilization, through village clusters, micro-cities, cities to urban centers. The dynamics of change has been constant in the evolutionary trend of civilization, and of the growth of cities. The only deviation in the narrative of globalization and urbanization is that the developed cities of western world have always served as the case studies. This could be attributed to the fact that the West for example, laid better technological foundations that helped in the realization of their city development plans. The catch-up game has been the order of the day with African countries and cities. In examining the effects of a globalized and urbanized world, and its attendant security implications in Africa, this chapter, as a point of departure focuses on the technological dimension of this problem.*

Keywords: Environment, *Food, Security, Urbanization, Technology.*

Introduction

The migration of people from hamlets and rural areas where mostly the source of livelihood has always been agriculture, to bigger and well planned towns and cities and the concentration of people in those places, otherwise called urban centers is called urbanization. Earlier in the evolution of man and society, people resided near where there was readily available land for farming, being what majority of the people engaged in for sustenance. There arose a pulling of those hands who no longer engaged in agriculture due to lack of land and those who wanted to try something new in the now emerging new centers. These new centers were relatively well planned in terms of infrastructure, roads, electricity, water, housing and modern transport systems.

The level of planning for the new urban centers depended on the geographical location. Each location was planned according to their peculiarities, thus the developed world, America and Europe have always been far ahead. To some extent the developing world countries have been playing the catch-up game. No doubt, there is a strong positive correlation between national levels of human development and urbanization levels, while cities are pushing their countries economic development, transforming society through growth in the productivity of labor and liberating masses from poverty, hunger, disease and premature death. Just as is found in everything in life, there exist some negative aspects of rapid urbanization which include increasing unemployment, overburdening of existing infrastructure and lack of access to land, finance and adequate shelter, increasing violent crime and sexually transmitted diseases and environmental degradation. As national output is rising, a decline in the quality of life for the majority of the population that offsets the benefits of national economic growth is often witnessed. Thus urbanization imposes significant burden to sustainable development (United Nations HABITAT, 1996).

For the first time in history the world over, majority of people now live in urban cities. The proportion of the world's population which is urbanized has grown rapidly and a larger fraction of the total population now live within urban cities than at any previous period in history. (United Nations, 2007). According to the 2014 World Urbanization Prospects by the United Nations Department of Economic and Social Affairs, 54 percent of the world's populations currently live in urban centres. There are today, 28 megacities in the world, of which 16 are in Asia, 4 in Latin America, 3 each in Africa and Europe, and 2 in North America (Khana, 2014).

As pointed out earlier, urban cities were planned with the basic necessities of life taken into cognizance. Thus, it attracts and accommodates more people today than at any other time before. Some of the most intractable contemporary social, political and economic dilemmas are concentrated in urban cities. For the past four decades the trend of urbanization has been faster in developing nations and it seems that the faster the rate of economic growth, the more rapid the trend towards urbanization of the population in these nations. (OECD, 2010). It is to be noted that urbanization globally has been fueled by globalization and modern technology, which in their reverse forms also serve to address many of the modern problems associated with rapid urbanization.

Just as change is the most constant variant in every arena of humanity, civilization, urbanization and globalization have all evolved through different phases and dimensions to the benefit of mankind and humanity. These three phenomena by all indications brought majorly positive inputs to the world and humanity, but that is not to say that there are no negative inputs from them. This chapter therefore examines the different aspects of security issues thrown up by urbanization. The world over, the primary responsibility of governments is the security of its citizens within and outside their sovereignty, more especially within. Three perspectives of security, life and property or as is often called, human security, food security and environmental security are given detailed attention in this study. A cursory study of African and Asian urbanization is undertaken.

We note that science, technology and innovation are key elements of sustainable urbanization and play a growing role in the character of many modern cities, or as they are called today-smart cities. It is therefore, important for authorities to focus on innovation-driven urban thought as a tool for scalable and reliable solutions that support positive socio-economic transformation. The question is how can urban policy-makers leverage science and technology to create safer, more inclusive cities that serve the needs of all citizens. Note also that technology alone does not make a city smart; it needs smart governance, smart businesses and smart citizens (Khana, 2014). A smart city is one that can effectively leverage technology, infrastructure, public policy and citizen engagement to create an urban environment that fosters economic growth and productivity, innovation, social mobility, inclusiveness and sustainability.

Although, urbanized areas cover less than 2 percent of earth's surface, they consume 78 percent of the world's energy producing more than 60 percent of all carbon dioxide (ISTP, 2016). In 25 years, cities are expected to absorb all new population growth globally, with the urban population in developing countries in particular, expected to double in the decades to come (UN-HABITAT, 2008). This unprecedented urbanization results in uneven exclusionary growth that isolates underserved populations and jeopardizes the security, safety and resilience of the city as a whole.

From all indications, urbanization is inevitable, and there is the need for countries, especially the developing countries of Africa to invest in research and infrastructure to support their growing populations, as much of the world's population growth is expected to be in Africa, and Asia. In Africa, to a large extent, urban infrastructure is poorly equipped to provide basic services of healthcare, food, water and fuel. There is therefore, a case to be made for the application of technology in mitigating the effects of urbanization, as existing technologies can ensure that urbanization combines quality living standards with relatively low greenhouse gas emissions and lower resource demands (Shetty, 2018).

A Conceptual Overview

Urbanization - Conceptually, urbanization has no single definition, rather its understanding is diverse and interconnected. It has been defined as a process by which rural areas are transformed into urban areas and involves the growth of urban populations through the combined effects of migration and natural increase (Waugh 1990). It was described as a change of employment structure from agriculture and cottage industries to mass production and service industries (Otto 2008). Urbanisation has equally been defined as the concentration of people in urban areas which includes large towns and cities (Lemanski, 2015). With the above definitions, some consistent features can be deduced: (1) demographic process, (2) necessary element of economic and industrial development (3) driving force behind social change and (4) a universal phenomenon. In researching the urban phenomenon, it is considered the dynamic result of a complex process of articulation of interactive and often conflicting economic, political, legal and cultural forces (Hove, Ngwerume & Muchemwa 2013). It could be argued that through this process, cities and rural areas in developing nations have been redefined by the changing nature of capitalism and by the process of globalization (Fernandes, 1998).

Security - It is appropriate here to mention the main aspects of security which are human security and the more conventional one national security. National security focuses on defending the state from external attack, while the human angle is concerned with shielding individuals and communities from any form of violence or insecurity. The term human security evolved from a UNDP report which sought to emphasise new concerns about global security and the importance of addressing chronic threats to human life (UNDP 2006). The report frowned at narrow concepts of security that pays so much attention to state security while paying little or no attention to the security concerns of the citizenry in their everyday activities. For the citizenry security is a much more encompassing concept. It means protection from the threat of disease, hunger, unemployment, crime, social conflict, political repression and environmental hazards. Human security here is an analytical tool that shifts attention in security analysis from state to individual (UNDP, 2006). Both human and national security should be and are often mutually reinforcing. Moreover, it is critical to note that a secure state does not automatically translate to a secure citizenry. It is the primary responsibility of the state to defend its citizens from foreign attack but it will amount to nothing if there is absence of human security within. And from the perspective of the problems of urbanization, human security concerns are a priority, of which the application of technology plays an important role.

Food security is another area that goes hand in hand with urbanization. The Food and Agricultural Organization of the United Nations (FAO) defines food security as a situation that exists when all people at all times have physical and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO 1996). This definition encompasses the four dimensions of food security which are availability, stability, safety and accessibility.

Environment - In respect of the environment, which in this instance refers to habitat, it implies the surroundings or conditions in which a person, animal, or plant lives or operates. The environment can be impacted upon by human activity and by technology, and can also be improved upon by technology. There are some positive impacts of urbanization on the environment and human well- being, e.g. higher population densities lowers per capita costs of providing energy, health care, infrastructure and other essential services. Urbanization has equally been associated with declining birth rates which reduces population pressure on land and natural resources (UN HABITAT, 1996). At the same time almost all major cities of the world are increasingly being plagued by environmental problems as follows:

- Urbanization in coastal areas often lead to the destruction of sensitive ecosystems and can also alter the hydrology of coasts and their natural features such as mangrove swamps, reefs and beaches that serve as barriers to erosion and form important habitat species.

- Conversion of agricultural land and forest, as well as reclaiming of wetlands for urban use and infrastructure are associated with widespread removal of vegetation to support urban ecosystem and put additional pressure on nearby areas that may be even more ecologically sensitive.

- Improperly handled solid waste can have serious health consequences. Sewage drainage systems can be blocked and may lead to contamination of groundwater at landfill sites. In some cities getting land for waste facilities is really difficult.

- Productivity of many cities is adversely affected by traffic congestion and water pollution which have become peculiar with heavily urbanized cities all over the world. Traffic jams in major cities of the world like Beijing, Lagos, New Delhi, Moscow are good examples.

- Air and water pollution in urban cities have become the cause of most cases of ill health in the developing countries of the world. Ambient air pollution impairs the health of almost all urban residents in many cities. Indoor air pollution is particularly hazardous for women and children of low income households who are constantly exposed to high concentration of air pollutants from cooking and heating sources in poorly ventilated buildings and enclosures.

- The present global warming is a direct result from urbanization and industrialization. Over the years mankind has had breakthroughs in different fields of human endeavor which is commendable but they have come at a great cost to humanity in general. The carbon emissions that most factories and industries over the decades and centuries have spewed go up into the atmosphere and have been heating up the ozone layer. Exhaust fumes from gas and petroleum vehicles, gas flaring by oil companies, terrible and dangerous emissions from coal industries are all contributing to global warming. Suddenly, the Arctic ice that has remained frozen for centuries are now melting at an alarming rate. As the ice melts, the volume of ocean and sea water increases and they claim more land from humans.

Technology and Urbanization

There is little doubt today that a direct relationship exists between the increased application of technology to the lives of citizens on a daily basis, and the incidence of Urbanization. Urbanization is one phenomenon that cannot be wished away. So far as there are more or better opportunities in the cities than in our villages in Africa, people will always move from the rural areas to the cities, this situation can be seen in the movement from the South Eastern states of Nigeria to Lagos, Abuja and Port Harcourt. Same for the situation in Kenya, where people move from the rural areas to Nairobi; or to Accra and Kumasi in Ghana, or to Yaoundé and Buea in the Cameroun. However, the application of technology could work both ways, either to increase the incidence of urbanization or reduce the impact of urbanization on citizens. It is the case that the introduction of commercial agriculture that relies more on mechanized processes in agricultural production could displace a significant number of subsistent farmers who hitherto had relied on manual labour. The result of this will be an exodus to the cities to look for better opportunities

for gainful employment. This has both short term and long-term implications, especially for food security, over-population, security and the environment. On the other hand, technology could also be applied to address the anticipated and unanticipated effects of urbanization arising from increased movements from the rural to urban centres. It could for example be deployed in creating more jobs in the ICT industry, in traffic control, in Early Warning Systems, in security surveillance and in environmental control.

In general, the world has become so urbanized that the percentage of the population living in urban areas increased from 29% in 1950 to more than 60% in 2010. As observed, with an increase in urbanization comes an increase in disorder, crime and related social issues (Kevin, 2012). With increased population comes the good, the bad and the ugly. People migrate from the rural areas to the cities where they are total strangers with different motives. Those that have skills get employed and become part of the positive trend; the unskilled ones, out of frustration; hunger and anger against the system find solace in anti-social activities like drug abuse, stealing, prostitution, robbery, kidnapping and cultism etc. The story is the same all over the world, with respective peculiarities. In the developing countries of Africa and in Asia with high propensity for corruption, money voted for basic infrastructure and social services find their way into private pockets thereby denying the populace basic social services like health care, affordable transport system, basic education, water, light and social insurance, and thereby exposing them to insecurity of diseases, hunger, unemployment, crime, social conflict, political repression and environmental hazards. When individuals amongst the population have no source of income and there are pressures and challenges that come with living in the urban cities that must be reckoned with, some may resort to criminality to survive and belong. Most often their activities lead to loss of lives and property.

It is against this background that we see the increasing use of technology and the deployment of modern surveillance techniques by the Police to address the kinds of crime and criminality characteristic of big cities. A good example here is the use of Closed Circuit Television (CCTV) by the Police and City administrators to monitor crime and traffic offenses in bid cities. The good news however, is that there are no policing problems that are solitary and peculiar to one country. Regardless of who performs the police function in a country, problems and responses are shared around the world and they learn from each other (Kevin, 2012). This is more so with the availability of modern communication methods powered by the Internet.

Apart from matters of physical security besetting major cities in Africa like Lagos, Cairo, Johannesburg and Nairobi, issues that have to do with human security are also major factors associated with urbanization in many modern cities. Ordinarily, availability of food refers to its access in sufficient amounts. Food stability requires that food can be accessed at all times, while food safety is linked to the quality of food. It is not enough that adequate amounts of food are readily available but that it can be consumed without the risk of major health problems. In the same vein, access to food is related to the resources an individual or household has to obtain food required for a healthy diet (Scmidhuber, Tubiello 2007). Most times able bodied individuals get frustrated and exhausted with subsistence farming that obtains in the rural areas. A person engaged in subsistence farming does not see bright prospects without machinery and government support. They abandon the land for clerical, administrative and industrial jobs in the city. This reduces the number of hands farming the land in the rural areas and the hinterland. When this happens consistently and overtime food shortages become inevitable. At times natural causes like drought in Somalia and Sudan contribute to this too. Because of the way farming is done in most developing countries, most school leavers regard it as dirty and a path way to poverty. This explains what happened in Nigeria, a country that was exporting cocoa, groundnut, palm oil before the advent of oil and petro dollar. Most able bodied young persons migrated to the cities in search of white collar jobs to the detriment of agriculture.

In the not distant future it is expected that there will be a tremendous demand on agriculture to supply food to an ever increasing population that will be heavily urbanized. This implies that more food will be demanded by a population of net food buyers, food demand will have to be met by rural urban farmers or by imports (Matuschke, 2009). Over time as cities expand, agricultural land is turned into residential and industrial areas. A typical example is the Chilean city, *Conception* with a population of about 500,000 inhabitants; where 1,734 hectares of wetlands, and 1,417 hectares of cultivatable agricultural land and forests were transformed into residential areas from the year 1975 to 2000 (Pauchard et al 2006). In Africa, in Accra, Ghana 2600 hectares of agricultural land are converted every year for housing and industries (Maxwell et al, 2006). Similar patterns are observed in China and Indonesia (Verburg 1999, Weng 2000). The immediate result is the disappearance of urban agriculture which play significant role in the supply of perishable vegetables to cities (Matuschke, 2009).

As urban cities expand and their population increases, it then follows that more food need to be transported and distributed within the cities. This puts additional strain on rural infrastructure, transport technologies and food distribution outlets. These being not enough already in many urban cities of most developing countries, the stability of food supply might be compromised (FAO, 2000). Bayo (2006: 116 -117) acknowledges these challenges for Nigeria. Without the urban and peri-urban contributions to a city's nutrients intake, the challenge of feeding a city will be very enormous. For a city of about 4 million inhabitants, food requirements average about 3,000 tons per day. This means about 2 three ton trucks every 3 minutes need to be delivered. Staple

food materials, vegetables, fruits, fish, meat will originate from different areas. Logistically, this poses enormous challenges in form of transportation, city traffic, quality and variety needed, and handling. These challenges apply both to locally produced as well as imported foods alike (Matuschke, 2009).

Food safety is therefore, of utmost importance since urbanization is partly driven by enlightenment; it decreases malnutrition and increases dietary diversity (Ruel, Garrett, 2004). In cities food is increasingly consumed outside the house. Snack and food kiosks of questionable hygienic standards dot the street corners. In most developing countries these food vending is unregulated. Majority of the stalls lack adequate refrigeration, water and sanitary facilities. Vendors are often not trained in preparing, handling and storing food safely. It is therefore not surprising that strong links between street food and the prevalence of gastrointestinal infections have been detected in developing countries (Maxwell et al, FAO 2008). Globally, these infections are a major cause of morbidity and mortality particularly among children. We assert that the most important aspect of food security in urban areas is having sufficient resources to afford a healthy diet. Urban inhabitants are net food buyers. In most cities of the developing world, inhabitants purchase more than 90 percent of their food (Maxwell et al, 2000, Ruel and Garrett, 2004). It thus follows that urban dwellers are more dependent on cash incomes, and thus employment opportunities, than rural dwellers. Having said this, it is now clearer that technology is needed not just in addressing physical security, but in ensuring food security, as well as environmental management. The modern city, especially mega-cities like Lagos, and Kano in Nigeria and Cairo in Egypt with populations of over 10 million dwellers are therefore expected to become innovators and users of 'smart technologies', technologies that eventually turn them into 'smart cities' in the mould of Singapore, New York, Toronto, Dubai and San Francisco.

Technology and Security Management in Modern Cities

At this juncture, it is important for us to note that while technology and its application is obviously a significant contributant to the increasing rise of urbanization in Africa as elsewhere, and also germane to the alleviation of many problems associated with urbanization; it is however, not to be addressed on its own. Its use or deployment has a lot to do with the quality of urban governance or the ability of the city administration to effectively and efficiently deploy technology. While technology is a great tool, it is however, double-edged like a sword that could be deployed both ways. Even the criminal elements in a city could effectively use technology, like modern ICT facilities to deceive, misinform, defraud or cajole citizens in ways that are inimical to them. A smart city administration is therefore expected to be one step ahead of potential threats to security because of the implications for the city dwellers.

A good security management architecture is therefore imperative for modern cities – issues of food security, food poisoning, public health, environmental pollution and degradation, hate speech, kidnapping, traffic offenses, touting, armed robbery and murder all need to be under the radar in a proactive way. Today, security management requires smart policies like turning hitherto area boys that abounded and hounded Lagos in Nigeria to gainfully employed LASTMA (Lagos State Traffic Management Agency) officials wielding mobile telephones or communication gadgets and working hand in hand with the Police. They serve not only as traffic managers, but also as sources of Intelligence information.

Like smart policies, smart governance and smart citizenship are all necessary to the running of modern urban cities. For instance, technology platforms used by these cities should be designed in such a way as to enable efficiency of governance and access to public data. This could for example include cloud computing services, sensor networks and data centres, and traffic management systems for both road congestion management as well as public transportation systems such as railways, subways and light rail. E-government portals and e-government services will therefore become more important for citizens to leverage for personal and community benefits. In short, as the price of technology falls and data analytics become more widespread, what will increasingly differentiate modern urban cities is not necessarily how 'smart" they are in the application of technology; though, this is important, but rather the extent to which they leverage technology to bring about innovation, sustainability and inclusiveness Khanna, 2014.

Conclusion

It has been our aim in this chapter to highlight and explore the linkages between urbanization, security and technology in modern cities in Africa and around the world. In doing this, the conceptual understanding of these key concepts were presented and analysis undertaken to unscramble the impact of technology, first, in contributing to the phenomenon of urbanization, and secondly; to finding solutions to the problems of urbanization.

It is increasingly clear that modern African cities now, and in the near future, face and will face several problems as identified characteristic of big cities and mega-cities. Managing these cities effectively, and especially the physical and human security issues generated will entail a mix of very proactive urban governance, application of technologies, and especially modern ICT technologies; smart policies as well as smart citizenry. Indeed, it is curious to see how big cities like Lagos, Kano, Cairo, and

maybe Nairobi will fare in the near future without revolutionary urban governance and the application of modern technologies to the problems of urbanization.

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