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URBANISM, SOLID WASTE AND URBAN METAMORPHOSIS IN AFRICA

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ABSTRACT: This paper reviews the challenges of solid waste generation in major cities of Africa; their effect on urbanism, and the socio cultural and economic impact on urban metamorphosis. Paper studies urbanism as a dynamic index of urban metamorphosis, with focus on solid waste management. The need for governance policy, legislation, and an environmentally motivated and enlightened urban residents is a factor mitigating a clean environment. Public education and programs where they exist lacks required exposure, intensity, and connection to correct the apathetic outlook of most urban residents to waste disposal. Paper strongly affirm the need for adequate funding, equipment, human resources, technology and energy use required in dealing with urban metamorphic forces sustaining waste generation. And in conclusion suggests for success to be achieved, a holistic program that integrates technology, socio-cultural, economic, and psychological factors needed in managing urbanization and wastes, in order to boost the positive impact of urban metamorphosis on the continent's cities' sanitation and development.

KEYWORDS: Africa, Solid Waste, Urbanism, Urbanization, Urban Metamorphosis, Waste Management.

1 INTRODUCTION

The first decade of the 21st century witnessed a large population increase in major cities around the world, changing urban lifestyle and urban metamorphosis. Currently, there are more than 20 mega cities around the world, each with more than 10 million people. It is projected that in the year 2015, there will be about 60 megacities with an estimated total demographic strength of more than 600 million people (Habitat 1996). Africa is the world's second largest continent, and accounts for about 14.72% of the world's human population, and currently, an estimated total population of over 1.0 billion people. Although, it has huge promising energy resources, Africa remains the world's poorest and most underdeveloped continent. Recent studies estimates that over a third of Africa's 1 billion inhabitants currently live in urban areas, but by 2030 that proportion will have risen to a half. According to a recent report from UN-HABITAT, the United Nations agency for human settlements, the population of some cities is set to swell by up to 85% in the next 15 years. The most populous city in 2010, Cairo, will grow by 23% to 13.5m people. By 2025, however, it will have been overtaken by both Lagos (15.8m) and Kinshasa (15m). Food and water shortages, poor infrastructure and a lack of housing are among the problems faced by governments during such rapid urbanization. Rapid urbanization in African reflects significantly migration from rural areas to urban areas. The process of urbanization in Africa as concur by many scholars and researchers dates back many centuries. 18th century, most African cities grew modestly in demography and spatial size. This paper, presented, in interrelated parts discusses urbanization in Africa, nature of city growth and solid waste treatment and disposal. A particular significance in this context is the effects of city growth and development on solid waste management. The paper then discusses potential innovative strategies to cope with the dynamics of urbanism as a necessary process of social change, with a prospect of having cities that are clean, livable, ecofriendly and economically sustainable.

2 LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 URBANISM OF AFRICA

Merriam-Webster's Dictionary defined Urbanism as the characteristic way of life of city dwellers and in likewise the study of the physical needs of urban societies. Urbanism of Africa, viewed in the socio-cultural context of urbanization, identifies various features associated with its patterns, processes, and impacts in development. Cities in the region are, observed to have changed in demographic size, spatial organization, and urban quality. Urbanization in Africa, though positive is accompanied by diverse defective developmental factors, which arose because of the inability of the cities' urban administrators to deal effectively with the issues accompanying urbanism. They include amongst others, low entrepreneurship, low technology, poor management strategies, non-independence, and inadequate finance. The resultant effect is a decline in the strength of formal employment in the urban economy and deterioration in the quality and distribution of basic infrastructure with a subsequent defect in the quality of life and the urban environment.

2.1.1 PATTERN AND PROCESS OF URBANISM

Human and financial resource is, invested in cities; their development and redevelopment signifies a continuing process. Although urbanism is manifest in the urbanization process of cities in Africa, Andah (1995), Habitat (1996) opined, that it, precede colonization. Colonial policy in Africa was, aimed at promoting rural- urban migration, because of the need for workforce in development. According to Adiukwu & Akinsola (2011), "the constant rural urban streams are motivated by relations of production with demographic force". Urbanism of Africa, as a socio-cultural dynamic reflects, and encompasses the everyday livelihood of the urban African resident with consequential impacts on the city's built environment, sanitation, economic, health, security, psychosocial integrity as well as the overall growth and development of the city. Urbanization is a process of spatial concentration of urban demography, anchored on some basic factors seen as urban metamorphic forces, which amongst others depends on urban migration, demographic dynamic and city annexation.

These processes explain urban demographic growth and development. The proportional increase in the demography of urban residents is largely due to metamorphic forces of rural- urban migration and regional expansion.

2.1.2 THE NATURE OF URBAN METAMORPHOSIS IN AFRICA

Historically, the World civilization may have begun in what became at present, "developing nations" principal cities and it is from these early centers of human civilization that urbanism, as a social concept and process, broaden. The next subsection provides an analysis of the types of cities prevalent in the region and their emergence.

2.1.3 EMERGENCE AND TYPOLOGY OF CITIES IN AFRICA

Udo (1987); Afolayan (1992), and Agbola (1998) Opined that three distinctive phases characterized the historical course of development of cities in Africa. They are the pre-colonial city, the colonial city, and the postcolonial city. Authors categories them as thus:

- **Pre-colonial Urban built environment:** All the pre-colonial urban centers in Africa were mainly pre-industrial cities, and they owe their importance to commerce, defense, administration, and religion. The most prominent of the surviving pre-colonial urban centers includes amongst other Timbuktu, Bamako, Maputo, Ouagadougou, Kinshasa, Kampala, Nairobi, Lagos, Accra, and Libreville.
- **Colonial Urban built environment:** During the colonial era, a great number of new towns were, established to provide the colonial administration base for operations. These establishments positioned their development on an advanced platform than previous (Afolayan 1992).The colonial administration constructed railways, roads, and improved agriculture in some urban centers. Such centers served many roles: administrative, commercial, industrial, and as transport nodes (railway terminus and seaports) for collecting and exporting products from the hinterland, and they enjoyed a high concentration of social services provided by the colonialist.
- **Post-Colonial Urban built environment:** Urban metamorphosis since independence of many African nations has marked the establishment of new towns and urban centers, attributed to government policies aimed at fostering national integration and development by upgrading the status of many small urban centers.

2.2 THE URBAN METAMORPHOSIS OF CITIES IN AFRICA

The universally accepted ranking of cities is usually through demographic concentration of people. A designated urban area requires a much larger settlement size than the rural areas, especially when we consider the number of people residing there. However, this determinant varies widely from nation to nation. In Africa, using demographic strength, an urban center has 5,000 inhabitants. Urban metamorphosis does not automatically bring affluence and prosperity; as affirmed by many scholars. Urban Metamorphosis in Africa represents a different situation from most Americans or Europeans cities. According to Hartshorne (1992), the problems associated with urbanization in most developing Nations are "false urbanization" in the sense that the process is mostly driven by demographic forces, particularly rural urban migration, rather than by dynamic technological and economic forces. Adiukwu (2014) affirm that rapid urbanization and inadequate capacity to cope with the needs of people in urban areas have contributed to the increase of issues that poses major health risks. Sanitation and drinking water quality are often poor, with the result that residents are, exposed to a wide range of unhealthy living conditions.

3 SOLID WASTE

Solid waste has become one of the leading environmental issue facing major cities in Africa. There is in recent time, rapid increase in the volume of waste generated in domestic houses, offices, commercial outlets, and local factories. These wastes of different shapes and sizes of material compositions are, heaped together, on overfilled and overflowing open dumps. Every so often, the major purpose seems to be to move the waste out of sight. This is one aspect of environmental degradation. Thomas-Hope (1998), Bartone (2000), opined that developing nations spend between 20% and 40% of their urban revenues on waste management but this is hardly adequate to deal with the capacity of the problem. when the governments of African nations were asked by the World Health Organization to prioritize their environmental health concerns, the results revealed that while solid waste was identified as the second most important problem (behind good quality water), less than 30% of urban residents have access to appropriate and regular waste disposal (Senkoro 2003). Though urbanism as a socioeconomic index provides an avenue for potential increase in GDP (Gross Domestic Product) and economic expansion, it also brings along wastes with hazardous effects, which if not managed can constitute health risks. Solid waste in the context of this article, is viewed as, a material that has no value to the person who is responsible for it, and not intended for discharge through a pipe; and usually generated by domestic, commercial, industrial, healthcare, agricultural, and mineral extraction activities and routinely accumulates in public places. Solid waste, generated by agriculture and mining activities, will not be, considered in this paper. Wastes from domestic houses, streets, shops, offices, factories and hospitals are usually the responsibility of urban authorities; this is the wastes of subject in this article.

3.1 SOLID WASTE MANAGEMENT

Less attention has been paid to the management of urban solid wastes. Since 1991, UNCHS (Habitat), UNEP, and UNECA have been developing a mutual position towards building a sustainable waste management policy and strategy in Africa. The Habitat Agenda clearly identifies the need for improving the living environment, particularly of the urban poor, to stimulate city development. The situation with respect to waste management in Africa is particularly severe. The public sector in many countries is unable to deliver services effectively, regulation of the private sector is limited and illegal dumping of domestic and industrial waste is a common practice. There is much evidence to show that solid waste management is much more than a technological issue –because it also involves managing a large personnel and a synergy with the public. Problems with maintenance and financial constraints are common in Africa. In Nigeria, for example in spite of the formulation of FEPA (Federal Environmental Protection Agency) and a national environmental policy, the environment has, not been, adequately protected; this same is evident in many of Africa's nations. The preparation and management of an efficient solid waste management scheme needs inputs from a range of professionals, and careful consideration of local conditions. An efficient and appropriate urban waste management is a clear indicator of the effectiveness of an urban administration. Issues affecting waste management include-

- Waste collection workers face exceptional occupational hazards, including strains from lifting, injuries from sharp objects and traffic accidents during their job disposition.
- Dumps of waste and abandoned vehicles block streets and access ways as evident in some cities.
- Dangerous items (as broken glass, razor blades, hypodermic needles and other healthcare wastes, aerosol cans and potentially explosive containers and chemicals from factories) may pose risks of injury or poisoning, particularly to children and people who sort through the waste for livelihood.

- Waste items that are recycled without being, cleaned, or sterilized can transmit infection to later users. (Examples are bottles and medical supplies.)
- Polluted water from waste dumps and disposal sites can cause serious pollution of water supplies.
- Waste that is treated or disposed of in unsatisfactory ways can cause a severe aesthetic irritation in terms of smell and appearance.
- Liquids and fumes, escaping from deposits of chemical wastes generated in factories can have fatal or other serious effects.

3.2 HAZARDS ASSOCIATED WITH SOLID WASTE

Improperly, sited open dumps, deface and pollute our urban environment, it endanger public health and sanitation because of exposure. In addition, it encourages the spread of diseases and bad odor. The poor state of waste management is attributable to an inadequately formulated and poorly implemented environmental policy, among other factors. Solid wastes, is, poorly managed in most Africa's cities, and they constitutes various negative impacts on the environment. Their relative impact depends very much on local conditions and includes-

- Uncollected wastes often end up in drains, causing blockages that result in flooding and poor sanitary conditions.
- Flies breed in some constituents of solid wastes, and flies are very effective vectors that spread disease like dysentery.
- Mosquitoes breed in blocked drains and in rainwater that is, retained in disposed cans and spread malaria a leading cause of mortality.
- Rodents like Rats find shelter and food in waste dumps and spread diseases.
- The open burning of waste causes air pollution; the products of combustion include dioxins, which are particularly hazardous to public health.
- Aerosols and dusts can spread fungi and pathogens from uncollected and decomposing wastes.
- Uncollected waste degrades the urban environment, discouraging efforts to keep streets and open spaces in a clean and attractive condition.

4 EFFECT OF LOCAL CONDITIONS ON WASTE MANAGEMENT SCHEME

There are many factors affecting solid waste management in Africa, and this varies considerably from cities. The design of an appropriate management scheme depends on local conditions. Amongst them are:

4.1 THE WASTE ITSELF

A typical domestic waste from an urban built environment has a high content of packaging made of paper, plastic, glass, and metal. The large amount of paper and the use of pre-processed food results in low proportions of moisture in the waste, some considerable high proportion of sand (materials used for paving and construction), and climatic factors which makes the waste very dense. In addition, the waste may contain large amounts of moisture because of the high usage of fresh fruit and vegetables. There are quite a few important effects of this density factor. Perhaps the major one is that containers, vehicles and schemes that operate well with low-density wastes in Nations like the USA, France, UK, and some other European nations are not suitable or reliable when the wastes are heavy. The combination of the extra weight, the abrasiveness of the sand and the corrosiveness caused by the water content, can cause very rapid deterioration of equipment. Another important consideration is the possibility of incinerating the waste. If the waste contains a high proportion of moisture, or is mostly inert material, it is not suitable for incineration, and so this treatment option is, ruled out. Recycling operations often reduce the proportion of combustible paper and plastic in waste before it reaches the treatment stage.

4.1.1 ACCESS TO WASTE COLLECTION POINTS

Many sources of waste can only be, reached by roads and areas, which may be inaccessible to certain methods of transport because of their width, slope, congestion, or surface hampers collections.

5 EFFECTS OF URBANISM ON SOLID WASTE MANAGEMENT

Urbanism as a socio-cultural dimension reflects a continual dynamic change in the built environment and urban lifestyle and it affects the economic mechanism of the society. This has huge impacts on the psychosocial life style of the people.

Many effects of urbanization are positive, such as new places for people to live, work and recreate, and economic growth. However, some of the impacts might be negative if not handled with foresight. Development of a city means more buildings, offices, commercial centers, and factories will be have to be, built and all these will lead to an increase in waste generated. Sediment from construction sites can end up in streams and rivers, choking plant and animal life. Oil and gas from vehicles can leak onto roads and parking lots. Fertilizers and pesticides, if not applied properly, can wash off lawns. All of these pollutants can wash away when it rains and end up in streams, rivers, lakes, estuaries, or ground water. Many industrial pollutants also bind to the sediment, so when sediment washes away it takes the pollutants with it. However, the combined impacts of human lifestyle and exploitative activities are threatening the health and safety of urban residents. Consequently, the continued unrestrained and unhealthy human habits of waste disposals in quest for justifiable urbanism, and to accommodate the urbanization process is a cause for concern. There are only a few cities in Africa, where waste is scientifically disposed or recycled.

5.1 URBAN RESIDENTS AWARENESS AND ATTITUDE TO WASTE

Public awareness and attitude can affect the willingness of urban residents, to accept the proximity of a collection point and carry waste to it. It also can affect their willingness to segregate waste for recycling and pay for services. The opposition in some instance, to the location of a waste treatment and disposal facilities, gender issues, collection activities and the social groups from which waste management staffs is sourced are amongst factors affecting management; other includes-

5.1.1 EQUIPMENT

In addition to the factors already mentioned the selection of waste collection vehicles, should be, influenced by the types of vehicles and chassis that are already widely used and for which spare parts and maintenance expertise are available.

5.1.2 PUBLIC AND INSTITUTIONAL ISSUE

the current and intended legislation on waste management; the extent to which it is enforced, standards and restrictions can limit the technology options that may be considered. The policy of government regarding the role of the public and private sector (formal and informal) in waste management also should be, taken into account. The strength and concerns of trade unions can also have a significant influence on waste management.

6 RECCOMMENDATION FOR PLANNING, DEVELOPMENT AND POLICIES

In general, the policy of most waste management authorities on solid waste disposals is not comprehensive thus arise a need for a comprehensive overhaul aimed at improving strategies. For example, as attempts made to draw public support during some cities' environmental cleanup exercise, no attempt is, made to develop appropriate disposal sites; there is a need to develop and sustain disposal sites. In some cities, solid wastes in different material composition are heaped together on, an already overflowing open dumps. Even so often, the major purpose seems to be, to move the waste out of public sight. It is obvious that, although there is a program to keep the immediate environment clean, there is no adequate plan for proper waste disposal; thus a need for a comprehensive management plan. In the face of the uncontrolled expansion of African cities, urban planners, city analyst, and stakeholders have been compelled to accept the inevitable truth that development policies for urban areas of Africa have been unsuccessful. The majority of Africa's cities and their completely uncontrolled growth are a testimony to the failure of development and planning policy of the areas involved. Mbassi (2005) opined these policies have focused on the need to slow down, the rural migration but to the contrary has not been accomplished therefore authors are of the view that urban policies aimed at developmental strategies needs to focus on local urbanism as a necessary index in utilizing and sustaining positive factors of urban metamorphosis in the built environment and city growth.

7 CONCLUSION

As cities in Africa, continues to metamorphose, the major challenge, thus, depends on the capacity to develop new technologies applicable in managing the dynamics of urbanism as a socio-cultural index mitigating solid waste disposal, and treatments. This can be, achieved by a pragmatic approach by authorities, stakeholders, and urban waste managers in dealing with urban metamorphic challenges and solid waste. Hence, the need to adopt and utilize innovative technologies, i.e. applicable, cost effective, ecofriendly and sustainable in meeting a city's local solid waste disposal and treatments needs; is imperative in the quest for a clean, environment healthy and ecological vibrant city.

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