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SUSTAINABLE CITIES: DRIVERS, OPPORTUNITIES AND OBSTACLES

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Abstract

This research probes the key issues in the sustainability of cities. The paper provides a critical assessment on the pre-conditions for sustainable cities. The work reviews the materials that are related to urban trends, structures, culture, theory and policy actions, which are the basic scopes of sustainable cities. The work identifies the key performance indicators of sustainable cities as affordable housing, efficient transportation system, smart infrastructure, safety, futuristic land use planning, equitable development, resilience, efficient energy use, climate change mitigation, pollution abatement, efficient waste management, as well as counter-urbanization tendencies. Moreover, the work recognizes the opportunities in sustainable cities as improvement in standard of living, enhancement in environmental quality, public awareness, as well as reduction in environmental crisis. Furthermore, the work identifies the constraints to sustainable cities as increasing population pressure, poverty, conflict in land uses, poor implementation of planning standards, haphazard development, unconstrained urbanization, shortage of infrastructure, as well as poor technology. Hence, for the attainment of sustainable cities, the work recommends development control, implementation of urban master plans, effective urban administration, provision of affordable housing, effective waste management, delivery of basic infrastructural amenities, as well as the use of appropriate technologies in environmental management and planning.

Keywords: City, Development, Environment, Infrastructure, Resilience, Urbanization, Safety, Sustainability

INTRODUCTION

The issue of sustainable cities is a major concern to urban planners, policy makers and stakeholders in the recent time (see Ibimilua & Ibimilua, 2020; Akanmu *et al*., 2018; Elmqvist, *et al*., 2019; Schipper & Silvius, 2018). Similarly, the attainment of sustainable cities is a contemporary issue across the globe (see Bibri & Krogstie, 2017; Hannele *et al.,* 2017; Houvila, Bosh & Airaksinen, 2019; Mohamed & Doaa, 2016; Nathali, Khan & Han, 2018; Vivek, 2017). According to Fellman, Getis & Getis (2003: 548) a city is 'a multifunctional settlement with a

central business district and both residential and non-residential land uses'. Within this context, a city is a nonagricultural settlement that has various land uses like residential, commercial, industrial, institutional, recreational and circulation. On the other hand, sustainable development refers to the use of resources in a manner that satisfies our current needs but does not compromise the future availability of resources (Withgott & Brennan, 2011: 20). A sustainable city therefore, is one that takes care of the interest of the present city dwellers without undermining the ability of future generations to make use of the available resources.

A sustainable city is one that is energy-friendly, functional, efficient, productive and resourceful. It is a city that is conducive and convenient for human habitation. A sustainable city therefore, is one that manages population size, economy and land uses within the context of productivity. According to Botkin & Keller (2003), the accomplishment of a sustainable city depends on the way the city is used. It is a city where there is a blend of land uses like residential, commercial, recreational, institutional, religious, circulation, industrial, and urban agriculture. A sustainable city therefore, is expected to be people – oriented, livable, resilient, secured, adaptable, functional, efficient, healthy, environmentally – friendly, and futuristic. A sustainable city is one that provides access to job, housing, education, protection, as well as freedom from environmental risks and hazards.

It is our moral duty to leave to our descendants a world in a better condition than at present (Spedding, 1999: 11). A sustainable city is one that is productive, appropriate and comfortable for living, working and playing. It is a city that is enabling, clement, and aesthetically pleasing. Hence, for the attainment of a sustainable city, there should be adequate provision for open spaces, functional transportation system, effective infrastructure design, environmental protection, conservation of man-made heritage, as well as mitigation and minimization of environmental degradation. Other requirements for sustainable cities are efficient services, effective waste management, methodical crime detection and reduction, as well as systemic solution to urban slums and sub-urban sprawls.

Several scholars have related sustainable cities to smart cities (see Yanhua *et al* ., 2021; Bibri & Krogstie, 2017; Hannele *et al*., 2017, Houvila, Bosh & Airaksnen, 2019; Mohamed & Doaa, 2016; Nathali, Khan & Han, 2018; Schipper & Silvius, 2018). Others have associated sustainable cities to safe cities (see for instance Devi & Divi, 2019; Ibimilua, 2009; Laanak & Ristvej, 2017; Saani *et al*., 2018; Vivek, 2017). A significant number of scholars have also linked sustainable cities to resilient cities (see for example Ahmed, 2016; Arafaf, Winarso & Suroso, 2018; Elmqvist *et al*., 2019; Gema, Merryn & Karen, 2016; Lorena, Taku & Abel, 2018). In all, slum clearance, resilience, smartness, and safety are prerequisites to sustainable cities.

Santra (2008) identified the important steps towards sustainable cities as population stabilization, land use planning, biodiversity conservation, pollution control, waste management, slum improvement, environmental education, as well as implementation of environmental laws

among others. For a city to be sustainable, there should be smart buildings, technology based infrastructure, efficient urban planning, as well as structured utilization of available resources. Looking to the future, the only possible way to sustain the global population is by having viable, resource-efficient cities, leaving the countryside for agriculture and natural ecosystem (Boorse & Wright, 2015: 629). The feasible ways to maintain the city are through environmental initiatives, technological advancement, progressive city planning, sufficient design, development control, as well as productive use of environmental resources.

Researchers have confirmed that there are several opportunities in sustainable cities (see Elmqvist *et al*., 2019; Satterthwaite, 1997; Bibri & Krogstie, 2017; Akanmu, Daramola, Ogunsesan & Adejare, 2018; Ibimilua & Ibimilua, 2020; Ibimilua, Ibimilua & Ogundare, 2020; Yanhua *et al.*, 2021; Yupeng et. al., 2020). Experts and researchers have also recognized the benefits in sustainable cities to include enhanced livability, reduction in environmental degradation, preservation of heritages, promotion of social equity and economic wellbeing, better living environment, higher quality of life, public awareness, environmental conservation, as well as reduction in environmental crises (see Hannele *et al*., 2017; Elmqvist *et al*., 2019; Speeding, 1999; Schneider, 2009; Kanagasabai, 2010; Chitkara, 2013; Ibimilua & Ibimilua, 2020). Sustainable development is a concept of good economic growth, a growth that can be maintained indefinitely with no or minimal damage to the environment (Chitkara, 2013: 51). The opportunities in sustainable cities are associated with development control, improvement in environmental quality, public awareness, creation of healthy environment, as well as mitigation of environmental degradation.

Development making purposeful changes intended to improve the quality of the human life often so degrades the natural environment as to threaten the very improvements that were intended (Withgott & Brenhen, 2011: 396). The major obstacles to sustainable cities include uncontrolled population growth, unconstrained physical development shortage of infrastructure, expanded energy use, upsurge car dependency, escalated traffic, deteriorating services and aging, environmental pollution, land degradation, as well as emergence of illegal structures. Others are decline in community distinctiveness, inappropriate disposal of waste, poor technology, conflict in land uses, growth of slums, sub-urban sprawls, shanty development, environmental hazards and disasters, as well as poor implementation of planning standards. Sustainable growth in cities has also been hampered by break down of laws and orders, unrestrained urbanization, blightedness, terrorism, unemployment, as well as epidemics.

Solving environmental problems can move us towards health, longevity, peace, and prosperity (Withgoutt & Brennan, 2011: 21). Resolving environmental crises in cities for the attainment of sustainability requires multi-disciplinary approach. It depends upon the collaborative effort of professionals like urban planners, building technologist, surveyors, estate managers, architects, as well as municipal engineers. Likewise, it demands the application of various approaches. The strategies include environmental education, urban planning and

management, rectification of the structural errors in neighborhood design, provision of community facilities like hospitals, schools, and libraries supply of a wide range of opportunities for different income groups, as well as furnishing of cities with a wide variety of transportation systems. Other strategies for achieving sustainable cities are strategic waste management, landscape planning, environmental impact design, pollution abatement justifiable energy use, development control, implementation of urban master plans, effective urban administration, crime prevention through environmental design, environmental impact assessment, as well as application of information technology in urban planning and management.

2.0 LITERATURE REVIEW

Global developments now focus attention on sustainability as an explicit goal (Bossel, 1999: 1). Sustainability in cities is equally a major interest for town planners, architects, building technologists, surveyors, estate managers, as well as municipal engineers. Moreover, it is a major concern for individuals, government, non-governmental organizations, and multi-lateral organizations. However, specific studies have probed into the major drivers, opportunities and obstacles to sustainable cities (see Satterthwaite, 1997; Bibri & Krogstie, 2017; Allan & Newman, 2018; Zaheer & Peter, 2018; Ibimilua, Ibimilua & Ogundare, 2020; Yanhua *et al.*, 2021; Yupeng *et al.*, 2020). The achievement of sustainable cities is one of the major themes of the sustainable development goals. Sustainable development itself has been defined as that development, which is free from environmental degradation, poverty, and depletion of natural resources base (Garg & Garg, 2013: 41). According to these environmental scientists, sustainable development means the use of available resources for economic growth and well-being, without exhausting such resources. They submitted further that the goal of sustainable development is to create a stabilized environment that is devoid of pollution, deterioration, decay, or damage to resource base.

Sustainable development refers to the use of resources in manner that satisfies our current needs but does not compromise the future availability of resources (Withgott & Brennan, 2011: 20). It entails the judicious use of environmental resources without destruction to the environment. In environmental management context, sustainable future refers to development and growth in harmony with nature; i.e., development which is environmentally non-degrading, technically appropriate, economically viable and socially acceptable (Jain & Rao, 2011: 1072). It denotes the meticulous use of environmental resources, as well as the conservation of the important components of the environment. Hence, Jain & Rao (2011) argued that the present development activities have caused considerable degradation to the environment. They asserted that existing resources should be developed and untapped resources exploited within the ambience of sustainability. In the purview of environmental management, they opined that resources are finite and that they should be used rationally. Among the strategies suggested by them are scientific disposal of waste, pollution abatement, environmental impact assessment, promulgation and implementation of environmental laws, as well as development of clean energies.

Dearden & Mitchel (2009: 608) referred to sustainable urban development as the enhanced well-being of cities or urban regions, including integrated economic, ecological, and social components, which will maintain the quality of life for future generations'. They identified the four major pre-requisites to sustainable urban development as urban form, transportation, energy use, and waste management. Where urban form refers to the available type and distribution of infrastructural amenities; transportation relates to efficient movement of people, goods and services; energy relates to the continuous use of energy in the urban buildings; and waste management denotes the systematic generation, storage, collection, disposal and treatment of waste. Other components of the urban structure that enhance environmental sustainability are residential, institutional, recreational, industrial, commercial, as well as urban agriculture. Moreover, the attainment of sustainable cities demands mixed land use pattern, preservation of open spaces, walk able neighborhoods, as well as the correction of past mistakes in cities.

Boorse & Wright (2015: 630) noted that sustainable cities are 'cities that have taken measures to reduce outward sprawl, diminish automobile traffic, and improve access by foot and bicycle in conjunction with mass transit'. Examples of such cities are New York, Stockholm, Barcelona, Tokyo, Toronto, Dublin, Amsterdam, Singapore, Copenhagen, and Dubai. These are smart cities where higher quality of life is enhanced by digital decision making, population control, citizen participation in urban planning, prudent energy use, and appropriate technology base for the control of slums and sub-urban sprawls. Boorse & Wright (2015) concluded that 'without the creation of sustainable human communities, there is little chance for the sustainability of the rest of the biosphere'. A sustainable human community enhances social lives, community distinctiveness, self-sufficiency and other orientors.

Bossel (1999) identified the orientors of sustainable cities as adaptability, co-existence, effectiveness, psychological needs, as well as security. Furthermore, he catalogued some of the physical constraints to sustainable cities as physical development and its restrictions, solar energy flow, as well as carrying capacity. He also recognized the human constraints as human actors, cultures, technology, role of time, as well as ethics and values. Other constraints identified by him are time and the role of evolution. No doubts, living meaningful and fulfilled life depends upon sustainable settlements, vibrant communities, inter-connected streets, application of ICT in government systems, as well as public safety. All these are disrupted by un-sustainable initiatives.

According to Kanagasabai (2010: 117), sustainable development is a way of ensuring equitable distribution in such a way that the poor will get a fair share of the benefits of greater wealth of the society. According to him, the attainment of sustainable development demands stabilization of population, poverty alleviation, improvement of health services, construction of ecologically compatible human settlements, improvement in the access to quality education, environmental awareness, as well as gender equality. The attainment and sustenance of cities demand good urban governance, community awareness, environmental upgrading, proper management of cities, provision of affordable housing, job creation, as well as poverty alleviation.

Growing urbanization followed by rapid industrialization has resulted in a large number of problems affecting all animate and inanimate things in a developing society (Chitkara, 2013: 1). The annihilation of the city landscape arises from man's use and abuse of environmental resources (see Samantha, 2021; Yanhua *et al*., 2021; Yupeng *et al., 2020*). Destruction of nature, natural beauty and serenity and the natural resources results from ignorance, greed, and lack of respect for earth's living thing (Chitkara, 2013: 7). Urban development, and expansion comes with adverse consequences on man and his domain. Environmental quality and quality of life are both adversely affected by the increased use of energy and other resources and by the construction of transportation infrastructure (IDRC, 1992: 49). Some of the outcomes of human activities in cities are reversible while others are irreversible. The uncontrolled growth and expansion of the city all along the fringe and development of slums in vital locations are the two important problems of any urban area (Santra, 2008: 1101).

Growing up in degraded environments could result in the development of negative attitudes in human population (Norton, 2009: 99). Researchers have confirmed that unbridled urban developments are characterized by shortage of housing, inadequate infrastructural amenities, health hazard, traffic congestion, lack of parking facilities, criminalities, indiscriminate waste disposal, as well as ecological problems (see Hick, 1974; Hayat, 2016; Thompson, 2016; Alan & Newman, 2018; Zaheer & Peter, 2018; Ibimilua & Ibimilua, 2020). The environmental problems arising from the unrestrained urban expansion are having adverse repercussions on man and his environment. They are responsible for challenges like environmental degradation, insecurity, health issues, land use conflicts, blightedness, as well as pressure on existing facilities.

The lack of respect for nature and its resources extends even to the earth's human descendants; the future generations who will inherit a vastly degraded planet and if destruction of natural environment continues at the present rate (Chitkara, 2013: 7). Poor environmental ethics and inadequate environmental awareness and protection are major cogs in the wheel of sustainable development. Chitkara (2013) declared further that 'development without sustainability amounts to uneven and lopsided development'. Hence, there is the necessity to control urban growth in order to enhance its sustainability. All nations of the world are now more or less conscious about environmental issues and taking steps to mitigate pollution due to development activities (Jain and Rao, 2011: 1073). However, the rate of environmental awareness and the quest for environmental sustainability is higher in developed countries of the world than in developing countries.

Threats to sustainability of a system require urgent attention if their rate of change begins to approach the speed with which the system can adequately respond (Bossel, 1999: 1). Risks to sustainable cities can be reduced by good urban governance, prompt implementation of master plans, execution of urban housing programmes, development control, urban renewal, as well as involvement of professionals like town planners, building technologist, architects, surveyors, and municipal engineers in urban development. Other measures are the provision of clean water,

electricity supply, efficient waste management, better transportation design, and land use management.

A city can never be free of environmental constraints, even though its human construction gives us a false sense of security (Botkin & Keller, 2003: 582). The argument here is that sustainability in cities is difficult to attain. It requires the application of appropriate technologies, urban management, pollution abatement, environmental planning, control of sub-urban sprawl, urban renewal, energy efficiency, as well as citizens' participation in planning. On this note, Withghott & Brennan (2011) submitted that city growth is somehow difficult to control because of the influx of people from rural areas to urban centers and that there is the possibility of growth of slum and sub-urban sprawl. Nevertheless, uncontrolled growth of cities is a major hindrance to sustainable development.

Khitoliya (2007) posited that for the achievement of environmental sustainability, development process and environmental protection must go on simultaneously. He considered development and environment as two sides of the same coin. Hence, he declared that every development activity has some impact on the human environment. Consequently he suggested poverty eradication, pollution control, environment impact assessment, as well as prevention of environmental degradation. No doubts, there are several opportunities in sustainable cities. Likewise, there are obstacles to the attainment of sustainable cities. Nevertheless, the achievement of sustainable cities depends upon efficient energy use, application of appropriate technologies in urban planning, eco-friendly development, proficient urban governance, public-private partnership, as well as the involvement of relevant professionals in urban management.

3.3 SUSTAINABLE DEVELOPMENT AND SUSTAINABLE CITIES

Since the beginning of the civilization, many cities have risen to greatness and disappeared into the sand of time (Jain & Rao, 2011: 1976). The factors that are influencing the location of a settlement include fertile alluvial plain, water, defense, dry land, shelter and aspects, trade, and situation. Also, the determinants of urbanization include rural-urban migration, pursuit for employment opportunities, search for better way of living, improved medical services, quest for higher education, opportunity for recreation and tourism, as well as availability of social amenities in cities (see Olatunji, Adebayo & Ibimilua, 2010 for greater details). On the other hand, the factors that are responsible for the fall of cities include shortage of infrastructural facilities, housing problem, slum formation, traffic problem, crime and violence, as well as anthropogenic and natural disasters.

There are several definitions to the concept of sustainable development. However, the most widely cited definition of sustainability is attributed to the so-called Brundtland commission, and states that sustainable development "is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987: 43 quoted in Karvonen & Brand, 2009: 43). Sustainable development is that which makes use of

available environmental resources without jeopardizing the interest of the future generations. It is "a pattern of social economic development which optimizes the economic and social benefits available in the present, without spoiling the likely potential for similar benefits in the future" (Schneider, 2009: 211). By this definition, sustainable development takes cognizance of the future generation in the process of harnessing the available environmental resources.

Sustainable development is a process of change in which the exploitation of resources, the direction of investment, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations (WCED, 1987). It implies the use of resources, protection of the environment, conservation of energy, as well as socio-economic equity. However, sustainable development implies not only equitable development but also environmental protection and upgrading (Chitkara, 2013: 53). It connotes the conservation of environmental resources for the use and benefit of the present and future generations. It denotes the improvement in environmental quality and the consequent creation of healthy environment for the present and coming generations. Sustainable development, then, means progress in human well-being that can be extended or prolonged over many generations rather than just a few years (Kanagasabi, 2010:16).

Botkin & Keller (2003) perceived sustainable development as that kind of development that will not cause irreparable damage to the environment while ensuring that future generations will inherit their fair share of all earth's resources. In this regard, sustainable development is perceived as a transition process whereby resources are harnessed in a manner that enhances the quality of the environment. For a transition to sustainable development, new and greater emphasis must be given to the full and true valuation of the natural, built and cultural environment (Richard & Naresh, 1996: 10). Hence, the goal of sustainability can be achieved through the encouragement of smart growth.

A sustainable city can be derived through the implementation of many measures and strategies. It entails the efficient use of resources, recycling of waste products as much as possible, the use of locally produced resources, encouragement of urban agriculture, as well as development of environmentally friendly technologies. Withgott & Brennan (2011: 195) perceived a sustainable city as one that provides effective bus network, makes arrangement for recycling and reuse of waste products, supports efficient health care, recognizes and cares for the poor people, gives room for social justice, appreciates environmental protection, and promotes environmental education. According to them, a sustainable city is one where there is energy efficiency, pollution control, minimization of waste, as well as conservation of biological diversity. In order to achieve all these, there is need for redesigning, rehabilitation, rejuvenation, and renewal of the city.

Satterthwaite (1997) submitted that sustainable cities become known as a result of the necessity to achieve sustainable development. In this regard, a sustainable city should be comprehensively adaptable, secured, peaceful, resilient, functional and efficient. The pursuance

of sustainable city is a way of ensuring that sustainable development principles apply at the local level. For sustainable development, society must meet the needs of the population and address social and economic inequality (Scheider, 2009, p. 11). At the city level, sustainability requires the integration of the needs of the people with the economy and the ecosystem. It involves the process of decision making that will make the city to work for the present and future residents.

Samantha (2021) declared that in the planning process of a sustainable city, consideration should be given to people living with disabilities. For instance, he submitted that while planning the built environment, provisions should be made for people living with dementia. Among others, he suggested that urban design, transportation planning, land use plans, improvement of thoroughfares, as well as development of downtown and other inclusive planning process should consider the comfort of people living with disability.

However, making the city work for the inhabitants requires the provision of accommodation for the increasing population growth, increased connectivity, vibrant and dynamic neighborhood, as well as enhancement of physical and mental health. Making the city work is the means of enhancing the lives of the present and future generations. It is necessary to ensure that the viability of future generations is not compromised through the actions of past or current generations (Speedding, 1999: 11).

3. OPPORTUNITIES IN SUSTAINABLE CITIES

There are several opportunities in sustainable cities. The benefits include ecological, environmental, social, political, economic and cultural benefits. Sustainability in cities is a bedrock of sustainable development itself. It is built around the wise use of city resources as well as the maintenance of urban amenities within the context of economy and efficiency. The principal advantage of sustainability is that it takes a pluralistic and inclusive view of problem solving, as opposed to conventional problem solving that limits its focus to particular elements while overlooking unintended consequences as well as the proverbial “big picture” (Karvonen and Brand, 2009: 43). The benefits of sustainable cities include enhancement in the provision of affordable housing and infrastructure, improvement in accessibility within the city, embellishment of the aesthetic quality of the city, better resources management, as well as fair sharing of resources.

Researches have revealed that the achievement of sustainability in cities ensures long term improvement in wellbeing, optimizes the use of human resources, increased public awareness, improves environmental quality, helps to reduce environmental crises and enhances social interactions and connectedness (see Richard & Naresh, 1996; Karvonen & Brand, 2009; Norton, 2009; Schneider, 2009; Ayoade, 2015; Hayat, 2016; Ho, 2017; Zaheer & Peter, 2018). The potential benefits of urbanization far out weight the disadvantages (Dearden & Mitchell, 2009: 481). The opportunities are increased whenever the city is sustainable. A sustainable city permits the inhabitants to get at least the basic necessities of life like drinking water, affordable housing,

and basic infrastructural amenities. It promotes energy efficiency, facilitates compact development, contributes to climate change stability, encourages recycling and reuse of resources, helps in crime prevention and improves safety of lives and properties. Bossel (1999) identified the opportunities in sustainable cities as effectiveness, co-existence, adaptability, security and satisfaction of psychological needs.

Man should learn to live in harmony with nature (Asthana & Asthana, 2012: 41). Living harmoniously with nature enhances environmental ethics and invariably environmental sustainability. Good environment will ultimately beget good economics (Chitkara, 2013: 51). The bond between sustainable development and sustainable cities is very strong. Sustainable development enhances sustainable cities. It reinforces neighborhood development, local governance, disaster management, poverty alleviation, safety superintendence, as well as conservation of cultural and historical properties. Sustainable cities give room for green and clean technologies in cities, lower the cost of living, improves the standard of living, and boosts people's life. It is a veritable tool for improvement in urban quality of life, abatement of environmental pollution, reduction in global warning and ozone depletion, as well as maintenance of ecosystems.

Sustainable development enhances people's quality of life while preserving environmental quality (Withgott & Brennen, 2011: 20). Sustainable development helps in the attainment of sustainable cities. The advantages include the provision of qualitative and affordable housing, supply of efficient transportation system delivery of infrastructural amenities, promotion of recreation and leisure, easy management of environmental hazards, as well as improved energy distribution. Other benefits of sustainable cities are conservation of resources, control of population through density control, creation of healthy environment, effective landscape planning, environmental impact design, as well as prevention of environmental hazards like flooding, erosion and biodiversity loss. For short, sustainability in cities helps in the protection and improvement of the environment, satisfaction of human needs economically, socially, culturally and politically, as well as recognition of the significant relationship between man and his environment. The importance of sustainability becomes obvious when the implications of unsustainable activity are considered (Hyde & Reeve, 2011: 232).

4. OBSTACLES TO SUSTAINABLE CITIES

How and where the built environment is constructed and developed can directly affect outdoor and indoor air quality in urban areas and can impact unspoiled areas and disturb animal habitats by replacing natural cover with impervious concrete or asphalt (Siyanbade, 2007: 34). Many cities across the world are battling with the issue of sustainability (see Yupeng, 2020; Hannele *et al.,* 2017; Bossel, 1999; Elmqvist *et al.,* 2019, Ibimilua & Ibimilua, 2020). Many are rising and falling as a result of physical, human, economic, technological and administrative challenges. Impediments to sustainable cities include high population densities, high crime rate, inadequate open spaces, high rate of unemployment, poverty, poor transportation network, warfare, catastrophes, inadequate infrastructure, as well as poor technology. Due to haphazard

growth, cities face the problems of overcrowding, power, sanitation, pollution and acute shortage of water, housing, transport, open space and public facilities (Jain & Rao, 2011: 176).

Bossel (1999) identified some of the physical constraints to sustainable cities as physical development and its restriction, solar energy flow, as well as carrying capacity. He also identified the human constraints as human actors, cultures, technology, role of time, as well as ethnics and values. Finally, he recognized the constraints of time and the role of evolution in sustainable development. The obstacles to sustainable cities include arbitrary urbanization, haphazard development, shanty growth, conflict of land uses, as well as shortage of infrastructural amenities. Development – making purposeful changes intended to improve the quality of the human life – often so degrades the natural environment as to threaten the very improvements that were intended (Withgott & Brennen, 2011: 396).

Sustainable development is a good idea but it does not address the problem of intra-generational equity in terms of global resources utilization that is the source of pollution causing global warming and other problems (Ayoade, 2015: 88). Sustainable cities cannot be achieved without the execution of development projects. Nevertheless, growth and expansion in cities are associated with environmental hazards and disasters. These impinge upon the sustenance of cities. For instance, a number of significant obstacles are encountered during the implementation of development projects like road construction, dam, industrialization, and provision of infrastructures like housing, bridges, sewers, streets, and electricity. If the impediments are not controlled, they can deter the sustainability of the city.

Sustainability in cities is also hindered by increasing population pressure, sub-urban sprawl, slum formation and uncontrolled development. Other challenges are associated with traffic management, public safety, waste management, unreliable electricity supply, as well as poor technology. Modern civilization has caused some damages to many cities across the world. Bossel (1999) stressed that 'we must be able to recognize threats to sustainability'. The identification of the imperils will help in providing long term solutions to the problem and invariably, the city will be conducive, convenient, and comfortable for human habitation.

5. CONCLUSION

This research probes the key issues in the attainment of sustainable cities. The theme of sustainability is a contemporary matter in urban and regional planning. Sustainable cities are meant to control urban problems like haphazard development, health hazard, environmental pollution, flooding, traffic congestion, excessive noise, and climate related issues. The developed countries of the world are fully aware of the necessity for sustainability of cities. Also, unlike the developing countries of the world, they have the technology drive to enhance growth and development within their cities. The mechanisms for the attainment of sustainability in cities include good urban governance, technological advancement, environmental awareness, self-reliance, land management, efficient use of energy, as well as implementation of master plans.

For a city to be sustainable, it should be ICT oriented, people oriented, smart in growth, and perpetual in terms of people, living, mobility, infrastructure, economy, and environment. A sustainable city should take care of the present and future generations. It should work towards development control, pollution abatement, waste management, adequate security, poverty alleviation, long term maintenance, as well as improvement of human wellbeing. The benefits in sustainable cities include wise use of environmental resources, secure and adequate livelihood, responsible urban governance as well as accountable stewardship. Others are citizens' participation in urban planning, technological innovation, access to housing, proximity to basic infrastructural amenities, as well as freedom from environmental hazards and risks. Nevertheless, restrictions to sustainable cities include increasing population pressure, poverty, conflict in land uses, poor implementation of planning standards, haphazard development, as well as poor technology.

6.0 RECOMMENDATIONS

As many cities of the world are attaining sustenance, many others are not sustainable because they are facing numerous challenges of increasing population, health, traffic, security, waste, resilience, and climate change. Sustainability is hampered by poverty, ignorance, diseases, catastrophes, poor governance, and many other hindrances. For the attainment of sustainable cities therefore, measures should be put in place in order to curtail the obstacles to conducive, convenient, comfortable, functional and efficient habitation. In this regard, actions should be taken against environmental deterioration, unconstrained development, pollution, indiscriminate waste disposal, land use conflicts, as well as population explosion.

Measure towards the achievement of sustainable cities include poverty alleviation, population control, provision of affordable housing, environmental education, development control, disaster management, efficient energy use, supply of infrastructural amenities, disease control, as well as enhancement of adequate security. Other pillars of sustainable cities are technological advancement, land management, efficient energy use, land use planning, slum upgrading, control of sub-urban sprawl, meticulous execution of urban master plans, as well as residential density control. Furthermore, the attainment of sustainable cities requires eco-friendly development, quality assessment and monitoring, enhancement of security and resilience, as well as application of modern techniques of environmental management and monitoring. Above all, for the sustenance of cities, there should be public private partnership, citizens' participation in urban planning and involvement of relevant professionals in decision making and urban planning.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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