

THE ROLE OF OPEN SPACES IN THE ATTAINMENT OF A SUSTAINABLE URBAN ENVIRONMENT IN NIGERIA

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ABSTRACT

This study addresses the concept of sustainable urban development in the context of open spaces. Relying on the symbolic nature of open spaces as desirable infrastructure in urban areas, where people meet to unwind, discuss and talk about things that matter to them, an empirical analysis was undertaken of how such places have high esteem for public life, contribute to the sustainable built environment as well as their role in shaping and creating the image of a city. The two case studies analyzed South Korean Cheonggyecheon, and Washington Square Park show that open spaces are a product of social activities and interactions, imageability, and physical forms that are instrumental in creating the image of a place and cities in general. Finally, the study concludes that successful open spaces can inherit and utilize the potentials of a site and, when carefully planned, are a means for attaining sustainable urban development. More particularly in Nigeria, where numerous open spaces and other natural features were being replaced with buildings and hard surfaces without adequate measures to install new ones or replace them, which increase the intensity of urban heat islands and possible exposure to pollution of the environment. Attaining successful sustainability in our urban places requires the careful maintenance of our open spaces in a functional and accessible situation open to all and not restricted to a few.

Keywords: Open Spaces; Urban Areas; Sustainable Urban environment; Nigeria.

1. INTRODUCTION

Open space is any undeveloped open piece of land (no buildings or other construction) publicly accessible. Green space is an example of open space (partly or wholly covered with shrubs, trees, grass, or other vegetation). Parks, community gardens, and schoolyards, as well as playgrounds, public seating areas, public plazas, and vacant lots, are examples of green space (E.P.A., 2021). In Nigeria, however, most of the shelterbelt and other natural features in urban spaces are part of the definition of open spaces. This is because the Government intentionally plans them for a social impact on the urban environment. However, today in most cities across Nigeria, it has become a common tradition, an act of cutting down trees and destructing other natural features in the urban environment to set up buildings, roads, and other structures. These natural features are precious and play vital roles in several ways, such as absorbing rainwater and pollution, reducing the intensity of urban heat islands and erosion, and providing a conducive environment for various activities. In this sense, retainment and integration of such features on-site instead of demolishing

them are among the means of combating environmental problems in a tropical region like Nigeria, where desertification, erosion, drought, pollution, heatwave are the common phenomena.

Given the above, the study aims to explore the potential of urban open spaces in Nigerian cities and the consequences of their deterioration with a particular focus on Sokoto metropolis and recommend how they can be aesthetically integrated into the site to attain a sustainable urban environment. A lot of efforts have been made by the Government in Nigeria to make the entire country a safe territory for its citizens by tackling several environmental issues such as desertification, drought, erosion, pollution, urban heat island, and other devastating problems sustainable urban development. For example, in 1977, the Government made a deliberate effort to establish the national committee on arid zone afforestation to curtail desertification, drought, erosion, etcetera. This initiative implanted shelterbelt and open spaces in cities and their surroundings (Figure 7) to improve the arid zone ecosystem and human livelihood (APCU, 1997). Similarly, concerning sustainable urban development objectives, the Government initiated the Urban and Regional Planning Act (U.R.P) in 1992. The act demanded an urban and regional planning board be established in all states of the federation, including Federal Capital Territory (F.CT) Abuja, to oversee any development of urban spaces in the country to avoid overcrowding and poor environmental conditions.

Subsequently, today such feat of urban forest (Open spaces and shelterbelt) established in urban spaces were vainly destroyed in a bid to establish public places, shopping complexes, houses, and some structures (Figure 8). This notorious act is popular in some states across the country. For example, Adamu et al. (2017) investigated the decline in tree cover in Sokoto metropolis, noting that, as cited in Dankani (2018), a decline of approximately 258 hectares occurred over 33 years from 1984, when it was 434, to 2017 with 176 hectares. He explains that critical vegetation patches adjacent to Runjin Sambo roundabout and one close to the Federal Secretariat, denoted by A and D on figures 1A and 1B, have completely depleted over time, whereas patches behind Giginya Secretariat and along Police Headquarters close to Wurno road (depicted by B and C in figures 1A and 1B) have depleted by 96 percent and 79 percent, respectively, from 1984 to 2017. This is a severe cause for concern, especially in this era of global climate change.

Some of the significant benefits of the forest in a city are; shelter against the excessive solar heat and a conducive environment for recreation in the summer. Urban forestry also provides up to 47% energy saving (Lawrence Berkeley National Laboratory). It also reduces urban heat islands helps city runoff by intercepting a large amount of rainfall. Moreover, it also reduces air pollution by absorbing CO₂ and further improves mental health and wellbeing. This study is expected to acquaint the general public with the potentiality of natural resources such as trees, water, vegetation, crops, animals, e.t.c. that were inherited from the site in urban spaces, and how they could be integrated to create appealingly sustainable public places for the betterment of the environment. Literature sources such as peer-reviewed journals, books, and internet material will be used in the study. Further, two case studies will be carried out to provide a practical example of the research. The study is structured into five sections: first is the introduction and overview of

the research, second is the concept of open space, third is the sustainable urban environment fourth is the part played by the open space in actualizing sustainability of the urban environment in Nigeria, and finally the conclusion.

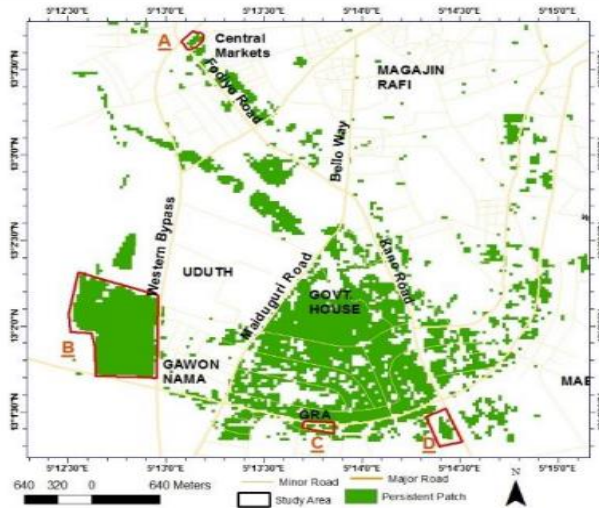


Figure 1A: Vegetated areas in 1984
Source: Adamu et al. (2017)

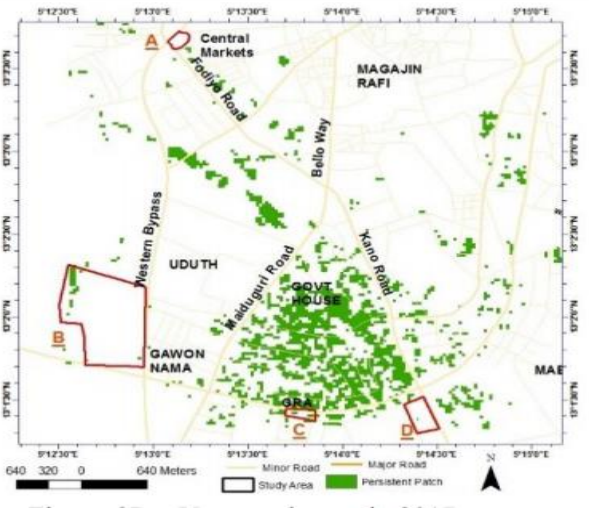


Figure 1B: Vegetated areas in 2017
Source: Adamu et al. (2017)

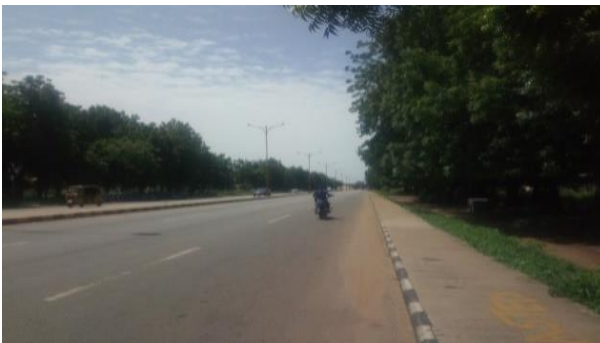


Figure 2: An urban forest along Birnin Kebbi Road, in Sokoto metropolis, Nigeria. The forest exhibit the role of public spaces where people relax and hide against the scorching sun in the summer. (Source: Authors)



Figure 3: same Birnin Kebbi road in Sokoto, the metropolis, buildings are currently replacing open spaces (Source: Authors)

2. THE CONCEPT OF OCE

Open spaces are described as open spaces to the general public, such as parks, squares, streets, community gardens, and greenways (Carr et al. 1992; Lynch 19720). These spaces are beneficial for urban life and sociability; Danish urban designer Jan Gehl (1987; Gehl and Gemoze 1996) called these spaces "life between buildings," and Ray Oldenburg (1989) calls them "the place where people gather regularly, informally, happily and outside the realms of their homes and their work." They are usually accessible to everyone. Roads, pavements, public squares, parks, and beaches are a broader spectrum of what constitutes open spaces (Public Spaces, 2019). One key role of urban parks is to provide space for the personal and cultural expression of diversity, raising

questions of democratic provision and access to open spaces for the general public (Thompson, 2002). Besides, Open spaces also provide psychological benefits in cities; spending time in an outdoor cafe or a bustling shopping street, according to psychotherapist Joanna Poppink, is more than just a pleasant diversion; it is a necessary component of a healthy urban lifestyle. She believes that a lack of open public spaces where different groups can interact is at the root of much of the fear and distrust felt by cities (Marcus, & Francis, 1997). "If we don't leave the house, we fill ourselves up with fantasies created from television and our fears." In contrast, when you're "out in the real world, you get to see people as they are: different ages, different races, different relationships that you can observe firsthand" (Morgan 1996, 59).

In Nigeria, however, most of the shelterbelt and other natural features in urban spaces are part of the definition of public spaces. They are intentionally planned for a social impact of the urban environment (Figure 3). Thus, open spaces in our cities today constitute a broader spectrum of placemaking in our urban environment by the city planners to enhance their aesthetic affinity and imageability. As "place is a pause in movement, animals, including human beings, pause at a location because it satisfies certain biological needs. The pause makes it possible for the locality to become a center of felt value" (Tuan, 1977).



Figure 4: Major attributes of successful public spaces
Source: (Tiesdell, Carmona, Heath, and Oc, 2003)

3. SUSTAINABLE URBAN ENVIRONMENT

Sustainable urban design is the art of shaping the physical features of urban spaces, including buildings, neighborhoods, public spaces, transport systems, streets, and other services to provide an artistic, convenient and pleasant environment for the social impact of the urban environment. Urban design has been practiced throughout history; however, in the 20th century, it became paramount due to the disorder of industrial cities (Fainstein, 2016), which called for sustainable urban environments to establish healthy and livable communities without damaging the ecological surroundings. Garden city ideas are one of the varieties of models that have been adopted by planners at the time, initiated by Sir Ebenezer Howard, hoping to plan self-contained communities surrounded by gardens (Urban Design, 2019). For this sense thus, one of the main goals of sustainable urban development is to ensure appropriate control over development and other anthropogenic activities in urban spaces so that its resultant do not cause a menace to the

environment, to make a city special, blend people with their natural surroundings and to promote communal and commercial activities safely which served variety of purposes including artistic, healthy, social, economic and environmental responsibilities (Figure 4).



Figure 5: The four pillars of sustainable urban development. A sustainable environment ensures the social impact of the urban area, environmental protection, boosting of economy, and equal rights to everyone in a city. (Source; UN/DESA)

The previous discussion shows that open spaces are significant in cities serving various economic, social, aesthetic, and environmental functions. This shows that in the tropical climate, integrating open spaces, precisely green spaces such as trees, in a new development instead of destroying them is an excellent initiative to increase the city's sustainability. Besides, open spaces boost the city's image, making it a thriving public space. Gehl et al. (2006) has outlined the main goals of place-making in urban areas. According to him, city space has always served three vital functions: meeting place, marketplace, and connection. As a meeting place, the city provides opportunities to exchange information of all kinds. As a marketplace, the city facilitated a commercial exchange of goods and services, and finally, public space enabled access to and connection between all the functions of the city.

Therefore, city planning has been a conscious endeavor by relevant stakeholders in managing urban areas to ensure the safety of the environment and public health, more workable and visually pleasing spaces and linkages across the city spectrum to improve physical activities and sociability and thus to ensure sustainable urban environment. Through case study analysis, the next chapter will shed light on how buildings can use the potential of their site to enhance aesthetic affinity, regulate the microenvironment, and boost economic activities for the public.



Figure 6: An innovative landscaping in city streets can be a good strategy for either absorbing or lessening the volume of stormwater circulation during a heavy downpour

(www.wikipedia.org/Green_infrastructure)



Figure 7: pedestrian zone, an effective planning strategy in limiting the volume of air pollution and vehicular accident in a community further it provides an inclusive mobility opportunity to physically

(Source:www.gettyimages.com/photos/pedestrian)

4. THE ROLE OF OPEN SPACE IN ATTAINING A SUSTAINABLE URBAN ENVIRONMENT IN NIGERIA

In the light of the discussion, it is clear that open spaces in the form of shelterbelts or other natural features across the cities in Nigeria serve some sustainable urban development goals. For this sense, it is a reasonable strategy to possibly either retain or replace them when uprooted while construction. Therefore, two case studies are Washington Square Park and South Korean Cheonggyecheon. South Korean Cheonggyecheon was chosen because of its similarity with the Nigeria case where artificial structures (streets) replaced natural features before revitalization took place after realizing the consequence. Similarly, Washington Square Park constitutes the second case study because of its natural potential that paved a sustainable urban environment.

Washington Square Park

Washington Square Park is a well-known open space in Greenwich Village, a neighborhood in lower Manhattan, New York City, established in 1826. The public square is a well-known tourist attraction surrounded by trees; people from all walks flock to this large square for recreation and relaxation. For more than two centuries, the park, with its signature stately arch and playful central fountain, has served as a place of countercultural gathering (Garay, 2019). Furthermore, Washington Square is a typical example of open space that demonstrates how a site's potential can contribute to sustainable urban development.

The Potential of Washington Square Park

The inherited site potentials of Washington Square serve as a source of public attraction from the start. The area was once enriched and divided by a narrow marshy valley through which Minetta Creek ran (Joan, 2007), and it was populated by vegetation (Figure 8). As a result, by the mid-17th century, the Dutch had converted the land on each side of Minetta into farmland. It remained

farmland until 1797, when the New York Common Council purchased the field to the east for a public burial ground. Furthermore, in 1826, the city purchased land west of Minetta Creek. The square was laid out and leveled before becoming Washington Square Park (Washington Square Park, 2019), enabling sociability and relaxation.

Given the preceding, the Washington Square site has undergone numerous transformations, from farmland to public burial ground to public square, with widespread recognition throughout New York City. Today, to make your house there, you will have to live quite substantially and still retain an inner feeling and non-compliance that has made it a popular attraction over the years (Zella, Parella, and Durbun, 2013).



Figure 8: An aerial view of Washington Square Park, showing vegetations, a monumental arch and a playful central fountain creating a conducive atmosphere for the sociability



Figure 9: In the background, a row of mass housing was created, rounding the square to enjoy the potential of the natural feature on-site.

Contribution of Washington Square to Urban Development

Since 1829, the area around Washington Square has been a popular tourist destination, and in 1833, a row of houses was built on the north side of the square (Figure 10). The prestigious residences are distinguished by their red brick exteriors in the Flemish bond Greek revival style. In addition, the entrances are flanked by Ionic and Doric columns, with marble balustrades, transforming the entire space into a stunning architectural setting (Washington Square, 2019).

South Korean Cheonggyecheon.

In its present state, Cheonggyecheon is a product of a large urban renewal project featuring a stream surrounded by vegetation functioning as a pedestrian public space in downtown Seoul, South Korea. Before its restoration and commissioning in 2005 (Figure 12), the public place was paved with concrete for roads, and in 1968, an elevated highway was built over it (Figure 11).



Figure 10: A view of Cheonggyecheon before restoration, after taking over by roads and other artificial structures

(Source:
www.landscapeperformance.org/case-study-briefs/cheonggyecheon-stream-restoration)



Figure 11: Cheonggyecheon after restoration in 2005 Creating a sustainable urban environment.

(Source:
www.landscapeperformance.org/case-study-briefs/cheonggyecheon-stream-restoration)

The Potential of Cheonggyecheon Stream in downtown Seoul

Following the setbacks caused by transportation infrastructures and other artificial structures taking over open spaces in downtown Seoul, such as an increase in vehicular accidents, pollution, and surface temperature rise, the potential of Cheonggyecheon as a nature-friendly environment were perceived. As such, the Government and other relevant stakeholders have pursued an effort to regain it into its natural setting (Cheonggyecheon, 2019).

Contribution of Cheonggyecheon to Sustainable Urban Environment

Cheonggyecheon is initially a creek that streams west to east across the center of Seoul and then meets Jungnan Cheon, links the Han River and lies into the Yellow Sea. As such, the creek offers a recreational environment and a remarkable public area that provides various advantages, regulating the microenvironment of its surroundings and significantly increasing local biodiversity—the restoration project aimed to regain its former glory and has received wide acclamation. According to Kim Youngmin, professor in the University of Seoul's Department of Landscape Architecture, in a radio interview, " Cheonggyecheon gave a certain answer to the controversial debate in urban planning between those who emphasized the vehicle-oriented city and those who believe the city should be more pedestrian-friendly." Korea scholar Matt VanVolenburg sees Cheonggyecheon renewal as " a visual centerpiece to Seoul's attempts to build a 21st-century city, with most of its humiliating 20th-century history removed and dotted with the recreation of the pre-colonial past" (Marshall, 2016). Because of this, Cheonggyecheon urban renewal establishes a modern public place that contributes solely to the social impact of the urban environment and sustainable urban development.

Table 1: Summary of the role of open spaces (e.g., greenways, parks, etc. in cities) towards Sustainable Urbanization in Nigeria

Social Benefits	Aesthetic/Psychological	Economic	Environmental function
<ul style="list-style-type: none"> • Meeting place (Gehl et. al, 2006; Oldenburg, 1989) • Sociability/providing a medium for the cultural expression of diversity (Thompson, 2002) • Provision of conducive environment in summer 	<ul style="list-style-type: none"> • Aesthetic/Visually pleasing (Gehl et al., 2006) • Healthy urban lifestyle (Morgan 1996, 59). • Urban identity/City imageability • increased quality of life through recreation and providing shade and shelter in and around towns and cities (Sustainable trade infrastructure in Africa: An essential element for growth and prosperity?") • More green space around one's house is associated with better mental health (Bos, van der Meulen, Wichers, & Jeronimus, 2016). 	<ul style="list-style-type: none"> • Local economy (business-oriented services) • Leisure & entertainment • Outdoor restaurants for various people, especially women 	<ul style="list-style-type: none"> • Reduces urban heat Islands (Climate Change Management, 2017) • Protecting against flooding by absorbing city runoff water (Rosenow, 2019) • Reduces city air pollution by absorbing CO2 ("Green Infrastructure: Cities," 2014) • providing improvements to biodiversity and amenity (Woods-Ballard; et al., 2015).

Source: Authors

5. CONCLUSION

In the study, the act of place-making in Nigeria is traditionally accompanied by irregularity of replacing nature with artificial structures, devastating the accomplishment of a nature-friendly environment. Therefore, there is a need for general awareness of the significance of green areas or any natural resources on-site toward attaining a sustainable urban environment. Also, Government and relevant stakeholders should double their effort in monitoring land development to ensure strict compliance to the sustainability threshold. Consequently, government and property developers are encouraged to sustain the status quo of incorporating a row of trees and other urban design elements in cities to create a pleasant and memorable atmosphere for the public.

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