

UTILISATION OF OPEN SPACES IN ENHANCING ARCHITECTURAL SUSTAINABILITY: A CASE STUDY OF METROPOLITAN LAGOS

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ABSTRACT

As a result of urbanisation, green fields in urban Lagos are being lost to urban development, with more open spaces being encroached. Tafawa Balewa Square's bordering racecourse has recently been misused and is now being landscaped as a concrete jungle. The poor quality of ancient open spaces in Lagos state is aptly demonstrated by the degradation of Lagos Marina by overhead bridges and the coastal erosion that erased the Lagos Bar Beach on Victoria Island to coastal erosion. To improve architectural sustainability: a case study focuses on Metropolitan Lagos. The qualitative analysis method compares the study area's built-up area to the land area initially designated for open space in the original plan. This study found that residents' social, economic, and cultural activities interact in complicated ways in open spaces, which serves as justification for using the location or nearby building.

Keywords: Green Space, Housing Estate, Open Space, Sustainability, Urbanization

1.0 INTRODUCTION

In metropolitan centres, the presence of open space is crucial. Prior to urbanisation, it is crucial to conserve the current green area. Urban open spaces serve as a repertoire of unique attractiveness and a marker for people's culture and history. (David & Senem, 2017). Open spaces help to foster an urban environment that enhances livability and protects and restores ecological diversity through the pathways of recreation for urban residents and sanctuary for endangered plants and animals. It also aids in reducing the impact of natural disasters. (Jegade, Adewale, & Olaniyan, 2019). Open spaces set a template for urban aspirations and recommend patterns for realisation. Researchers suggest that the inadequacy of open spaces and those available are misused and mismanaged, leading to a physical template on the environment and welfare of residents, which is symptomatic of its poor quality. (Olanusi, Akingbohunbe, & Ogunraku, 2017).

Therefore, the aspiration to attain a healthy and sustainable environment will require identifying and analysing urban open spaces related to city planning. According to Akintoye and Opeyemi (2014), there are numerous qualitative and quantitative issues with urban open space today. The required amount of open spaces is confined on a widespread basis. The housing market is congested, particularly in high-density areas where people are confined to buildings without access to outside spaces for recreation and gardening, which results in the street becoming a playground (Cooke, 2017). Viewing open space as less critical than other land uses would be inappropriate. Open space always loses when competing claims for a

specific piece of land are made by dwelling, parking, commercial, industrial, and other land use categories. This issue has made the investigation necessary (Kingsley & Omatsone, 2010).

Lagos state often experiences seasonal flooding during the rainy season because it is one of those states with a very high-water table and is also subjected to industrial effluent discharge into lagoons and waterways, which are also compounded by the indiscriminate dumping of refuse in open spaces. (Emordi, 2005). Lagos State is launching a greening project to maintain and conserve the biodiversity and ecology of the environment in Lagos state in order to accomplish the 7th Millennium Development Goal, which is to ensure environmental sustainability. (Kingsley & Omatsone, 2010). Certain government policy workers have realised that preserving open spaces can enhance recreation,

instigate natural disasters, and preserve specific geographical and biological attributes, which can incentivise preservation efforts (Leah, 2000). The observable trend of urban growth is low density along the urban fringe, which may come with the loss of open space creation and reduction of existing one (Kitchin & McArdle, 2015).

This study emphasised the current shortage of open spaces in the state to give an acceptable sociocultural response to the citizens' need for recreational options in Manifestation of Defensible Space in Lagos State Development and Property Cooperation Housing Estates, Lagos, Nigeria (Jegede *et al.*, 2018). The study focuses on the present situation and the utilisation of open spaces to comprehend their problems by comparing the government housing estate in Lagos State. The focal point of this study is the governing agency, if there is one. In this study, the physical and aesthetically pleasing characteristics of urban spaces are covered, and the provision, availability, sufficiency, and use of open spaces within the Lagos metropolitan area are emphasised. (David & Senem, 2017).

2.0 LITERATURE REVIEW

Typically, public places provide opportunities for leisure, cultural, and enjoyment activities. Cities' social and economic activities revolve around them and should be seen as crucial land use, equally crucial to other land uses. (Bashorun & Ayeni, 2013). The concept of recreation spaces suited for recreation, both active and passive, goes beyond vacant lots, parks, and neighbourhood squares. Open spaces encompass conservation land (government-owned or organisational) earmarked for agricultural lands, green buffers to roads, and spaces for recreation, either passive, such as walking or hiking, or active, such as soccer, tennis, or basketball (Michael, 2009). Cities of the global south are witnessing unprecedented population increases in urban centres, particularly since the last century, which has resulted in explosive urban growth that has culminated in megacities. In the emerging world, two factors accelerate urban population increase: natural growth occasioned by a net increase in birth rate and rural-urban migration brought about by the supposed city appeal as the centre of prosperity. (Angelidou & Psaltoglou, 2017).

Any city's land use can be split into two main categories as a function of its landscape. The first category consists of the structures that house the various functions, such as business, housing, industry, and education. The second group comprises the nearby parks, residential yards, public and private roadways, and undeveloped land (Ndidi & Anthony, 2008). The people in which the city is built are more significant than the natural and climatic conditions that affect the cityscape. Open space is territory left in its natural state or transformed into artificial gardens for use or enjoyment in a parallel universe (Oduwaye, 2005). This change can also be considered conserved terrain with a particular aspect, such as preserved panoramic or historical significance. Open spaces come in different types and complexities, from front gardens to private backyards, and

others are complex, like school playgrounds, race courses, golf courses, botanical gardens, and country regional parks. This concept could also be broadly used in waterways, rivers, valleys, hills, mountains, lakes, and oceans (Bashorun & Ayeni, 2013).

Significantly, open space provides benefits ranging from scientific to air and water pollution mitigation, reducing urban sprawl to the social level, like crime reduction, revitalising neighbourhoods to make them more home cohesive, and providing recreation opportunities. Economic benefits through business opportunities and attractive property values are also there (Dimuna, 2011). It is a tremendous disappointment that open spaces are disappearing in some areas of Lagos, which has numerous adverse effects on the quality of life and property values. The upper and middle classes will not frequently be present in a neighbourhood lacking recreational amenities. The building of homes also displays the development of slum and ghetto conditions without enough ventilation (Aluko, 2011).

Open spaces and gardens play a crucial role in the structure and use of urban centres. Residents' utilisation of open spaces takes many various forms. Open spaces are an essential component of the urban landscape, shape its function, and have the quality of life as one of its outcomes (Olanusi *et al.*, 2017). Furthermore, Open spaces mirror a city's social and psychological fabric and provide a window through which its cultural diversity is displayed while also serving as a repository of memories for the city dwellers. Open spaces are generally seen as land in its natural form, either existing in its natural form or altered to form gardens (Michael, 2009).

2.1 Importance of Open Spaces

Additionally, the presence of open spaces offers several opportunities. First is the opportunity for social inclusion through social interaction. This opportunity can encourage communal activity and capacity building that fosters citizenship and local pride, which may reduce antisocial behaviour and crime (Kitchin & McArdle, 2015).

Open spaces are also the go-to places for cultural activities in urban centres, serving as channels for preserving the city's cultural heritage

by helping to mould a visually pleasant environment that can support living, working, and exploration. It helps stabilise local housing and markets, attracting investments that boost economic activities. The benefits of open spaces also extend to children and young adults, as physical activity and fresh air can help them stay healthy and safe from illnesses like obesity (Basiri *et al.*, 2017). Open spaces also benefit urban cities in the pursuit of a sustainable environment by helping to reduce population and offering ecological and visual diversity, something that used to be the preserve of the countryside (Cooke, 2017).

2.2 Urbanisation

Expansion in the urban cities often outstrips those of the countryside; as regards population growth, especially in third world countries, this growth now strains on city amenities like water, electricity, and public transport, leading to what can be referred to as an inverse relationship between population growth and quality of life (Ellis & Roberts, 2016). This growth manifests as sociological problems of crime, health, inadequacies, low education, and other incidental environmental issues. However, the reality of urbanisation is often that of desperate ecological centres that have experienced decapitation to give way to the more economically rewarding high-rise apartment buildings (Adejumo, 2002).

This distortion results in open spaces that are not amenable to correction. However, elements of open spaces like parks, beaches, and nature reserves located in urban areas generate quality urban living. (Bashorun & Ayeni, 2013). In the same vein, gardens are a form of open space that serves as a venue for social gatherings, sports, and educational meetings and helps to reinforce diversity and place identity for urban residents. (David & Senem, 2017).

2.3 Green Space Concept

These gardens conveniently support human activity while sustaining wildlife, plants, and aquatic conditions. This balance ensures an adequate quality of life for urban dwellers. The above assertion is also valid for green space regarding quality of life; it is better appreciated when viewed as flora and fauna. These pillars of biodiversity make a city worth living (Adejumo, 2002).

2.4 The British Open Space

Historically, as far back as the nineteenth century, the countryside has receded in proportion to the growth of its cities; this leads to the deprivation of residents of places for healthy exercise and recreation. It also manifests as school playgrounds, which provide places for schoolchildren

to train and play, and teachers organise various sports like football. This activity will eventually develop into school sports and games associations (Angelidou & Psaltoglou, 2017). Several rules apply to how open spaces are laid out and planned in all New Towns in Britain, following the excellent London development plan (Ellis & Roberts, 2016).

The following recommendations are focused on: offering fields, with a suggested standard of 6 acres per 1,000 people; offering pitches, courts, and green belt areas for public or private usage; offering play areas for kids, such as traditional playgrounds (with permanent equipment and hard surfaces), standard designs, and areas for ballgames (with goal posts and floodlights) (Ellis & Roberts, 2016). Depending on the availability of space, there are natural play areas (land left in its natural state with hollows and bushes), toddler areas, adventure playgrounds, and comprehensive playgrounds. A path and a golf course are also available, depending on the age distribution, growth in demand brought on by the leadership, youth services, local conditions, participation patterns, climate, and the proximity of available space. Broad space guidelines have been formulated by the Greater London Council (GLC) for Town growth proposals (Ellis & Roberts, 2016).

Table 1: Greater London Council's suggested open space standard

OPEN SPACE	TYPE	AREA/ACRE (Ac)	POPULATION
Town	Park	1 Ac	1,000
Public	Playfield	215-3 Ac	1,000
Private	Playfield	1 Ac	1,000
Children	Playspace	0.5 Ac	1,000
Remaining	Playspace	7-8 Ac	1,000
Total		12-13.5 Ac	5,000

Source: Greater London Council Field Survey

Other organisations create other population range guidelines that consider sports and social development in addition to this regulation, which governs how open space is developed in Great Britain. Furthermore, because Ebenezer Howard, a famous utopian and the creator of

the Garden City idea, was the brains behind these parks in the nineteenth century, the British experience emphasises the availability of parks. It is difficult to imagine any district or location in Great Britain needing more parks due to the country's importance of parks (Cooke, 2017).

2.5 Nigeria Open Space

It is nearly incomprehensible that modern Nigerian cities (Lagos, Kano, Ibadan, and Benin) have prioritised the supply of open space less than older ones because early settlements in Nigeria have always incorporated open spaces and gardens. Provision for town gardens, walks, lanes, and roadways is a subject of development alternatives, such as in Ile-Ife, Igbo, and Hausa towns. (Akintoye & Opeyemi, 2014). Unfortunately, Contemporary city developments have systematically taken over existing open spaces and have gone ahead to eliminate them together in new and expanding schemes. Typically, courtyard houses or "courtyard architecture" enclose the open areas to provide outdoor space within residential areas, witnessing the progressive disappearance of courtyard architecture. Urban dwellers' activities have increasingly been squeezed to the point of discomfort. Shaded open spaces that serve as outlets for heat generated by buildings and that also serve noise, dust, and odour filters, thereby encouraging relaxation, are disappearing. (Olanusi *et al*, 2017).

2.6 Lagos State Open Space

Relaxation and the need for open areas to appreciate one's interests have historically been neglected in Lagos. As a result, there are now few amenities in urban areas that promote or even permit the general population to exercise, play, or unwind away from the hustle and bustle of urban life. (Emordi, 2005). Open spaces and their amenities seem novel or unimportant to policymakers. To address the population's requirements, the Lagos State Government, for example, needs to provide urban places for recreation through its facilities; the most current ones need to be adequate for the population. They need to be more readily available. It can be argued with accuracy that the numerous concepts proposed in the past state government approach to open space management and protection have yet to produce any tangible results (Adejumo, 2002).

2.7 Standard for Open Space in Lagos State Residential Housing

This "New Town" idea is considered a valuable addition to already existing towns and cities because it helps Lagos. This city is rapidly expanding, absorbing, and dispersing its extra inhabitants. (David & Senem, 2017). The allotment of open spaces in Lagos New Town is based on the specific standards and parameters listed in Table 2. In low-density estates, 5% is frequently budgeted for open space, while 10% of the total land area for high-density housing projects is kept as designated open spaces. The overall population of New Town is in proportion to the total area of land that is developed. In essence, the design criterion must include a determination of the population density per unit area. The goal of any design is to maintain the density of people per unit area as low as feasible. Making such a choice avoids slum conditions and urban congestion. (Oduwaye, 2005).

Table 2: Recommendations for open space in Lagos State housing developments

Usage	Total areas of public open space
High density	5–10% of the total open area
Medium	3 – 7% of the total open area
Low density	2 -5% of the total open area

Sources: Lagos State Development Planning Unit

Table 3: Proportional Land Use in Lagos State's New Town Projects

Usage	Percentage for use
Residential	A range of 60 and 70%
Commercial	A range of 15 and 32%
Roads	A range of 15 and 20%
Industrial	As required
Recreation	A range of 10 and 20%

Sources: New Town Development Authorities

2.8 Study Area

The study region is the Lagos Metropolitan region, located between latitude 6° 22'N and longitudes 20° 42'E and 30° 22'E East, respectively. The oblong shape lies along the coast of the Atlantic, covering a distance of about 180 kilometres, and is bordered to the east and south by the Nigerian state of Ogun and the Republic of Benin, respectively (Aluko, 2011). Its five administrative divisions are Ikeja, Badagry, Ikorodu, Lagos Island, and Epe. It covers an area of approximately 358,862 hectares or 3,577 sq. km and comprises five (5) administrative divisions: Ikeja, Badagry, Ikorodu, Lagos Island, and Epe. The Ogun Rivers, Ologe Lagoon, Kuramo Waters, Badagry Beach, Five Cowries, and Omu Creeks are only a few of the state's natural water features (Esan, 2021).

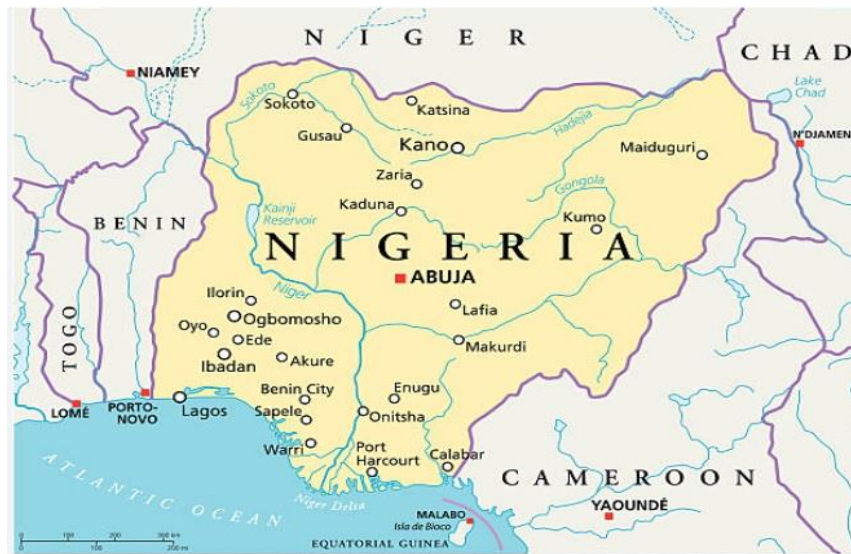


Fig. 1: Lagos State within Nigeria context

Source: Google map. <https://images.app.goo.gl/Woy3K3q2E47VJZh68>

Since the 16th century, there have been numerous alterations. The creation of banks and telephone services was a crucial component in the development of Lagos and its surroundings. The first railway connecting Lagos and Otta was built in 1897, and 95 kilometres of the lines were finished. (Johnson, 2010). There have been attempts to build a bridge between the Island and the Mainland, rehabilitate some Oko-Awo areas, or relocate residents to Surulere, Yaba, or Ebute-Metta. The Lagos Chamber of Commerce was established in 1877, and the General Post Office in 1808. Lagos state saw a tremendous rate of expansion between 1809 and 1968. The area's land mass expanded from 1.55 square miles in 1891 to 27.22 square miles in 1963. (Adejumo, 2002).

3.0 METHODOLOGY

In order to compare the extent of the actual built space in the study area to the land area allotted for open space in the original plan, a qualitative analysis method is used, as the degree to which open space in the state complies with the law, the function of Lagos State planning standards and the experts in the built environment. The survey targeted notable residential estates in Lagos State, while 30 in-depth interviews and 6 focus group sessions were conducted with professionals in the built environment and community leaders. Additionally, open spaces were selected for detailed analysis. Interviews and focus groups were held for residents of public residential estates owned by the Lagos State Development Property Corporation and the New Town Development Authority (NTDA) in the Omole Scheme Estate, Iba Housing Estate, and Raji Rasaki Estate. This study entails the Lagos State Housing Company deciding on the style of residential homes. Responses include government employees, independent contractors, non-government employees, and professionals in the built environment.

4.0 RESULTS AND DISCUSSION

The following was discussed regarding the open spaces that are currently present, as well as the physical, social, and historical context of the chosen residential estates in Lagos State, including Lekki Peninsula Scheme 1, Dolphin Estate Ikoyi, M.K.O. Abiola Garden City, Omole Scheme Ikeja, Iba Housing Estate, Raji Rasaki Estate, Alliance Housing Scheme, and Alliance Housing Scheme, Ojokoro.

Among these estates, Lekki Peninsula Scheme 1, established in 1982, spans 1,046.60 hectares and caters to the affluent yet needs help in the planning authority's implementation, leading to the reallocation of designated recreational space for residential purposes. Dolphin Estate, completed in 1991, is a low-density residential neighbourhood lacking adequate amenities for outdoor leisure, and its open space faces limitations due to a reservoir tank and other uses. MKO Abiola Garden, initially known as Marwa Garden, was implemented under the Lagos State Family Support Programme in Ikeja Local Government and contributed to the region's social and recreational landscape. Omole Scheme 1, within Ikeja Local Government, includes an open area that is poorly maintained but utilised by local children for football. Iba Housing Estate, located southwest of Ojo town, represents a newly developed neighbourhood with distinct areas like the ancient Iba town and the Iba Housing Estate constructed under the Jakande Administration, reflecting the diverse residential fabric in Lagos State.

4.1 Availability of Open Space

The findings on the amount of open space in the residential areas under study showed the relevance of open space and the need to access its availability. Conclusions drawn from the findings are as follows: Lekki Peninsula recorded 28% of open space that was available and 72% of estates that were unavailable; 36% of the area at Dolphin Estate was open space, while 64% was unusable quite the opposite; The MKO Abiola Garden calculated a 39% availability rate for open space and a 61% non-availability rate; Omole scheme showed 32% of open area to be available and 68% to be unavailable; Iba Estate scored 51% for open space that was available and 49% for the area that was not; Raji Rasaki recorded 19% for open space that was available and 81% for unavailability.

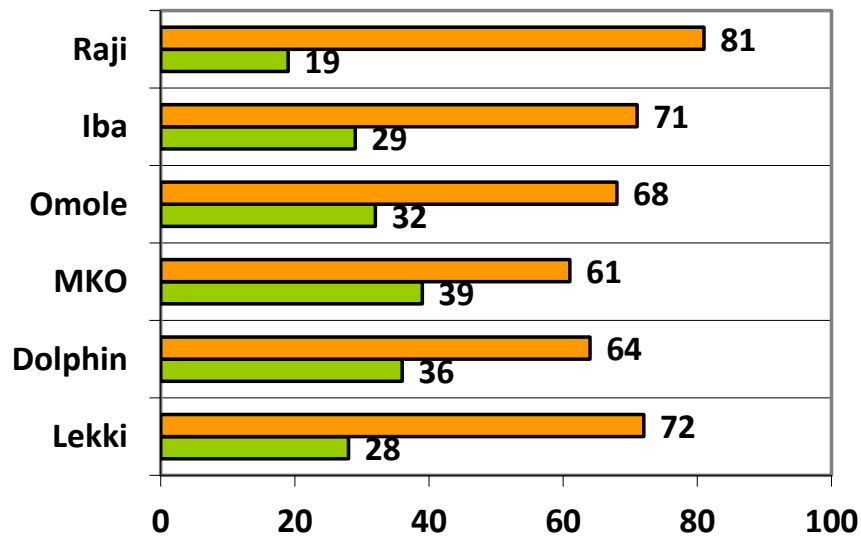


Fig. 2: Availability of open space

4.2 Comparison of Open Space with Stipulated Standards

According to the report, the Lekki Peninsula has 1.01% of its area for recreational use. Compared to the government-provided standard for open space, Dolphin Estate has 1.42%, MKO has 2.31%, Omole Scheme has 3.63%, Iba has 2.48%, and Raji Rasaki has 1.4%. These results show ineffectiveness and a need for more management control of open spaces by the appropriate channel to supervise and lead land use development for the state's residential estates, especially the planning authority.

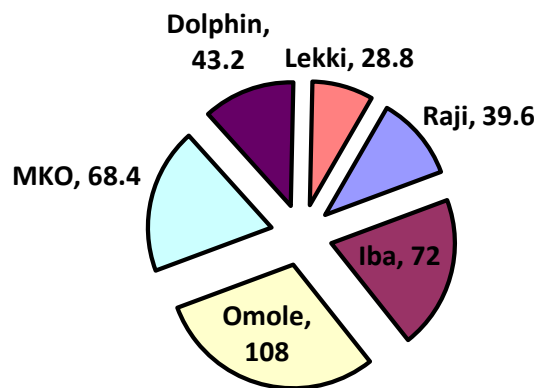


Fig. 3: Comparison of open space with stipulated standard

4.3 Existing Use of the Open Space

The need for proper use of these open spaces within residential areas makes it necessary to ascertain how the open space in residential estates is currently being used. On the Lekki Peninsula, there were 21% recreational gardens, 9% open areas, 22% playgrounds, and 48% other uses, such as celebrations, religious activities, and ceremonies. A recreational garden, a children's playground, open space, and other uses comprised 27%, 30%, 40%, and 12% of Dolphin Estate. MKO Abiola noted 59% for a garden for recreation, 30% for a playground for

kids, and 11% for other uses. Omole Scheme 1, on the other hand, recorded 46% for a recreational garden, 22% for a playground for kids, 14% for open land, and 18% for other purposes. Iba Estate had a recreational garden, a playground, and 25% open space, with the remaining 19% used for other purposes.

Raji Rasaki also noted 19% for leisure activities, 21% for playgrounds, 22% for open space, and 38% for other uses.

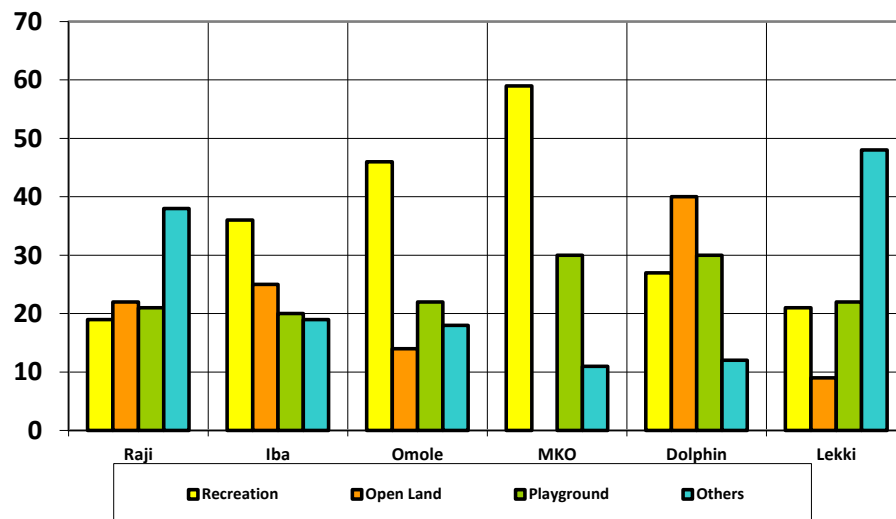


Fig. 4: Existing use of the open space

4.4 Maintenance of Open Space

The level of upkeep of the open spaces in the housing estates was as follows: Only 17% of the open space, according to Lekki Peninsula, was kept in good shape, while 83% of the remaining land was not. In Dolphin Estate, just 26% of the open space was effectively maintained, while the other 74% required additional care from the appropriate parties. According to MKO Abiola, only 28% of public places are kept up to code, while 72% are ignored. Omole Scheme 1 scored 31% for adequately maintained and 69% for inadequately maintained. Iba Estate has a rating of 85% poorly kept and 15% appropriately maintained. Raji Rasaki has 9% of its open space that was effectively maintained, and 91% of it needs to be better maintained.

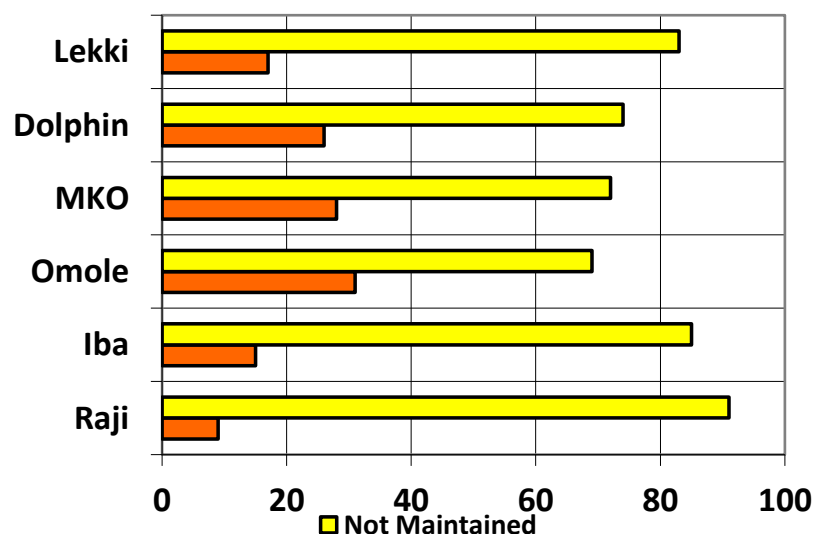


Fig. 5: Maintenance level of open space

5.0 CONCLUSION

An open space is a tangled web of neighbourhood economic and sociocultural activity that justifies using the location or nearby building. Social and cultural activities in a public area are pertinent to structuring a community. The site's social, economic, and cultural infrastructure and the services offered to citizens are significant factors to consider. The public has very high standards for social comfort and open space. As stated in this study, there were numerous problems with open spaces in residential areas, including poor application of open space standards by architects, failure of the planning authority's framework for developing and managing open space, architects, and non-development of land reservations. Consequently, statutory authorities needed a precisely defined function in maintaining open space.

To ensure a quality environment, it is advised that the government set up a plan to design, build, administer, and promote beautiful open spaces in the city of Lagos. Policymakers should prioritise open space and chances for survival. In order to direct the design, development, and administration of open space in residential estates, it is also necessary to adopt planning criteria. The private and governmental sectors work together to launch a campaign for landscape enhancement and open space management within residential complexes. Resources must be pooled to raise the money needed to build infrastructure for outdoor recreational activities and promote the beauty of open space. A window should be opened to address the lack of park gardens and effectively manage open space in housing estates.

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