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# Adoption of Sustainable Site Planning Strategies by Beach Resorts in Lagos, Nigeria

O. J. Ediae<sup>1</sup>, J. C. Egbudom<sup>2</sup> and F. J. Abeng<sup>3</sup>

Department of Architecture, Covenant University, Ota, Ogun State, Nigeria.

Authors emails: <sup>1</sup>osahon.ediae@covenantuniversity.edu.ng

<sup>2</sup>jude-thaddeus.egbudonpgs@stu.cu.edu.ng

<sup>3</sup>favour.abengpgs@stu.cu.edu.ng

**Abstract.** Resorts are commercial establishments specialised to meet vacationers needs through the provision of specialised services such as food, entertainment and accommodation. Most of the facilities provided by beach resorts are outdoor-based, therefore detailed attention should be paid to the landscape and external environment and this implies that the implementation of sustainable site planning strategies is crucial in achieving sustainable development. This paper seeks to investigate the adoption of sustainable site strategies by Beach Resorts in Lagos, Nigeria to understand how the various strategies could be applied in Site planning. The study was limited to beach resorts in Lagos, Nigeria and three resorts were carefully selected through purposive sampling. A qualitative data collection method was adopted and data collected were analysed through content analysis and findings revealed that there is high adoption of sustainable site planning strategies by beach resorts. Design strategies for site planning in a bid to create more sustainable developments in Nigeria were recommended.

**Keywords:** Beach Resort, Sustainability, Sustainable Site, Planning Strategies, Site Planning

## 1. Introduction

Resorts offer many advantages to consumers; they serve as a location of recreation for people of all ages and ethnic backgrounds, they provide comfort and convenience, they provide entertainment for all ages, and they provide a peaceful place to relax away from the bustling metropolitan area. Vacations have been proven to offer a variety of health advantages, including better mental and physical health and greater brain capacity. These advantages may contribute to increased workplace productivity and improved family connections [1].

Because the earth's ecology is extremely fragile [2], even if beach resorts have benefited society and economy via tourism, the influx of huge people results in detrimental environmental impacts in the host towns [3]. One of the negative consequences of this is climate change, which results in a rise in sea level and a retreat of the shoreline [2]. Due to the nature of coastal tourism, which is highly reliant on high-quality surroundings, resort activities would ultimately degrade the host environment, thus losing the attention of visitors and guests. This trend renders coastal expansion extremely incompatible with sustainability.

The environmental problems that Beach Resorts provide have created an urgent need for proactive steps to guarantee environmental sustainability. Among the built environment's components, particular attention must be given to buildings due to their significant impact on health and environmental deterioration, carbon emissions, and global warming. The concept of green building was established to address problems caused by the construction industry and to have a minimal impact on the environment and people [4]. Adequate policies and activities may result in substantial ecological and human advantages. [5] emphasized the significance of Beach Resorts adopting a sustainable strategy as a concept that satisfies visitor and user needs while also protecting the environment and creating future possibilities.

Reid *et al.* [6] discovered that the most critical factor for coastal projects should be sustainable site planning. This is because the majority of resort activities take place outside [7], and the development's



biggest difficulties relate to land usage and the environment. Sustainable site planning is a green building concept that encourages ecologically conscious site planning and design (SPD) [8]. The stage of sustainable site planning and design enables designers to carefully rearrange the site layout, as well as to position and move specific elements on the site, such as materials, temporary roads and parking lots, buildings and amenities, and so on. Sustainable site design is an efficient method of maximizing land-use efficiency in construction development [9]. This paper aims to investigate how Beach Resorts in Lagos, Nigeria, are implementing sustainable site strategies in order to better understand how the various methods might be used in site development.

## 2. Literature Review

A resort is a self-contained commercial business that aims to satisfy the bulk of a vacationer's requirements on-site, including lodging, entertainment, shopping, food and beverage, and recreational activities. A resort is a hotel facility that includes a range of amenities, such as entertainment and recreational activities. A resort is a place where people come for vacations, leisure, or day trips [10]. This may be a single structure, such as a hotel, or it can be a whole island or a ship at sea. One of the most desirable characteristics of a resort is that visitors are freed of the majority of daily duties, which are often handled by the facility's staff. Typically, resorts provide a range of activities, such as massages, cosmetic treatments, gourmet dining, and live entertainment. A beach resort is simply a resort with access to a beach. To be labelled a destination amenity, the resort must be located on the beach (not merely have access to it), offer guest-only beach amenities, and amenities and activities that suggest the beach as an anchor feature [10].

Green construction seeks to minimize a building's environmental impact and to promote natural resource conservation. While the effect of buildings on the environment (particularly on land) is unavoidable, certain design strategies can be used to mitigate negative impacts on the land's ecology [11]. A sustainable site is a critical aspect of green building, and environmentally conscious site planning and design (SPD) decisions are critical in the development of a site [8]. Site planning and design are two critical issues that planners must consider when forming a sustainable site. Planning and design creatively incorporate the function, use, and needs of the building's users, resulting in a functional, workable, and efficient environment. The stage of sustainable site planning and design allows designers to meticulously reorganize the project's site layout, as well as to locate and relocate specific features on the site, such as materials, temporary routes and parking lots, buildings and facilities, and so on. Atanda & Olukoya [12] identified that in Nigeria, Sustainable site as a criteria for green building is not considered in the national building code and recommends that it should be studied and considered in planning. In the adoption of green building practices in Nigeria, Faremi *et al.* [13] identifies that sustainable site planning and conservation of natural environments and biodiversity integration are not considered in the design by professionals. Therefore, relevant literature suggests that the integration of sustainable site planning into the design process is low in Nigeria.

Sustainable site planning is an effective method of maximizing land-use efficiency in the construction of buildings [9]. Huo *et al.* [9] carried out an assessment of the criteria in sustainable site planning across the various green building rating systems, the result of the study highlighted the various strategies and divided them into three broad groups which are; Based on resource management, based on surrounding conditions and based on natural Environment.

### 2.1. Resource Management Based

Green SPD's main concept is sustainable resource usage, which means reducing energy and other resource consumption.

**2.1.1. Land Use.** This is because land usage involves interconnectedness between individuals and communities, which has a significant effect on economic and social well-being [14]. Ecologically vulnerable areas should not be developed to reduce environmental impact. Redevelopment of formerly occupied or contaminated land should be encouraged, with adequate evaluation and cleaning. Using sustainable development principles, underground construction aims to minimize environmental hazards while saving energy, increasing urban structure diversity, and reducing local transportation demand

Underground structures are naturally shielded from severe weather and are fully isolated from all climates [9].

*2.1.2. Passive Building Design.* The passive design uses natural elements to heat, cool, and light a building [15]. Passive design is the most cost-effective and widely accepted technique of reducing home heat load. Passive solutions reduce or eliminate the need for mechanical systems, energy consumption, and CO<sub>2</sub> emissions.

*2.1.3. Green Vehicle Parking.* Green cars produce less pollution than gasoline or diesel-powered automobiles, or cars that run on alternative fuels. Green vehicle marketing reduces pollution by encouraging alternatives to conventionally fueled vehicles [16]. Green vehicles should be given priority parking in green SPD, either within the electric vehicle charging stations or liquid or gas alternative-fuel filling stations.

*2.1.4. Less Parking Floor Space.* Reduce the number of paved surfaces to allow rain and snow to naturally flow over the landscape and into groundwater aquifers. Minimizing site development footprints may help preserve natural areas and allow for their restoration. In fact, reducing parking footprints reduces surface parking land [17].

*2.1.5. Irrigation.* For example, preserving or growing urban greenery and avoiding ecological damage on-site are examples of irrigation. To conserve potable water, build appropriate landscape irrigation systems that utilize rain or recycled water, and use drought-tolerant plants [18].

*2.1.6. Stormwater Management.* Preventing agricultural land erosion and floods in highly populated urban and rural areas requires stormwater management. Stormwater management is the detention, retention, or release of stormwater for reuse or groundwater absorption. Within the limitations of current infrastructure, stormwater management should aim to mimic or preserve the natural hydrologic cycle [9].

## *2.2. Environmental Conditions*

In addition to utilizing existing building resources, conserving urban humanistic history, and maximizing site resources.

*2.2.1. Local Transport.* Sustainable transportation systems, according to the European Union Council of Ministers of Transport, can provide basic human and environmental needs while promoting intergenerational equality [9]. To discourage private car use, a sustainable building project's parking capacity should be restricted. To reduce pollution, building occupants should be encouraged to use public transit instead of private vehicles and taxis.

*2.2.2. Integration to Immediate Environment.* An open space is any undeveloped, publicly accessible region free of buildings or other structures. In land-use planning, open space includes parks, community gardens, public sitting areas, squares, and playgrounds. Closer interaction with the environment and society is encouraged by open space, which also adds to environmental quality [9].

*2.2.3. Daylight Access.* The sun, the sky, and the spaces between and around them light up structures. It may adjust the urban fabric to the environment, ensuring that all buildings and spaces get sunlight. The effect of new buildings on vulnerable neighbouring structures should be carefully considered in green SPD [9].

*2.3. Natural Environment.* The third SPD principle in green buildings is that the natural environment should be properly preserved to create coordination and harmony between the project site and the surrounding ecosystem.

*2.3.1. Building Microclimates.* Used and accessible places such as building entrances and exits, pedestrian paths, open spaces, streets and podium gardens, walkways, sitting spots and playgrounds all help to create microclimates. Wind, sunlight, temperature, and air quality should all be considered while designing a site's microclimate [19].

*2.3.2. Heritage Cultural.* Cultural heritage offers a framework for understanding previous social, cultural, and economic developments. Because cultural continuity and human history are important factors in social cohesion and belonging, cultural heritage preservation is essential for sustainable development. Protecting archaeological remains, historic buildings, and monuments on-site helps maintain and preserve cultural heritage components in the surrounding areas [9].

*2.3.3. Ecological Conservation and Protection.* To promote green land usage, green buildings should be built on low-value land, to maintain existing biological features throughout the site design and construction stages. Conservation of habitat is the most effective method to reduce the negative environmental impacts of new development. On-site, green buildings help to create or maintain native species habitats, preserving and enhancing local biological diversity [20].

*2.3.4. Ecological Management Plan.* Because construction sites are the main working surfaces for projects, poor site management may create substantial environmental contamination, affecting both nearby inhabitants and the broader public. It is important to minimize the environmental impact of building and demolition activities during the construction period. Effective environmental management should strive to reduce noise pollution, air pollution, water consumption, and construction waste, as well as enhance worker health on construction sites [9].

### **3. Methodology**

The study was carried out to investigate the adoption of Sustainable Site Planning Strategies in selected beach resorts in Lagos, Nigeria. This needed the features to be identified, examined and described for clarity and easy understanding, therefore the research employs a qualitative research approach, as the research problem is aimed at understanding and describing a phenomenon. The study is a multiple case study research and data was gathered from the selected case studies. 12 beach resorts in Lagos state which meet the amenity criteria to be termed a beach resort were identified [21]. In selecting the Beach resorts in Lagos, three beach resorts were randomly selected within Lagos state. The selected beach resorts were La Campagne Tropicana Beach Resort, Whispering Palms Beach Resort and Atican Beach Resort.

In order to gather relevant field data, a literature review was first carried out in order to identify the features for assessing the level of site sustainability this was used to develop an observation guide. Data collection from the beach resorts that constitute the sample size was done through the use of the observation guide. The observation was divided into two sections; the first collected the relevant project information, the second addressed the Sustainable site features. The sustainable site planning strategies were noted and documented. Field data were collected between June 2021 and July 2021. To analyse the data, the sustainable site planning strategies were assessed on a scale of 0-5, zero being the least and 5 being the highest. The result was content analysed and presented with the use of a descriptive approach.

### **4. Results And Discussion**

As stated in the methodology, the three selected beach resorts were investigated. The first is the Whispering Palms Hotel, situated in Iworo/Ajido town, off the Badagry Expressway. The resort is on the beach and has magnificent ocean views. The Whispering Palms Badagry restaurant serves local and continental cuisine, as well as daily breakfast, guests can order soft and alcoholic beverages at the bar. The Lagos lagoon is a natural wonder that also highlights a historical aspect of the region. The Whispering Palms Resort Lagos has free parking and is open 24/7 and also has a conference hall that can host workshops, seminars, and meetings. Whispering Palms Resort is 20 minutes from Slave Museum House and 30 minutes from French Village and the 1st Storey Building in Nigeria.

The second beach resort examined is the La Campagne Beach Resort is located on a 65-acre piece of property that contains a mangrove swamp and naturally separates the lagoon from the Atlantic. All features are emphasized within a cultural and contemporary design, preserving the fascinating tropical village identity. The resort's design incorporates learning while having fun, from the welcoming gestures to the native names of the chalets and the indigenous use of furniture both inside and out. Lagoon and

mangrove forests enable visitors to view a broad range of tropical plants and animals, including snake trees, mangroves, epiphytes, bats and kingfishers.

The third, Atican Beach Hotel in Lekki, Lagos, is located on the Atlantic Coast and has an outdoor swimming pool and water sports facilities. This hotel has a restaurant and a 24-hour front desk. Guests may order a beverage at the bar. All rooms have air conditioning, a flat-screen TV with satellite channels, a refrigerator, a kettle, a bath or shower, and a desk. Each accommodation has a private bathroom, and some rooms have a balcony or a view of the sea. Each room has a wardrobe. The hotel offers a substantial English/Irish breakfast each morning. The hotel has a children's playground and an Olympic-size swimming pool.

Table 1: Adoption of Sustainable Site Planning Strategies by the Selected Beach Resorts

Parameters	Comments		
<b>Sustainable Site Planning Strategies</b>	Whispering Palms Beach Resort	La Campagne Tropicana Beach Resort	Atican Beach Resort
<b>Based on Effective Resource management</b>			
Use of previously occupied or contaminated land for site development	No previous site development	No previous development on site	The site has not been developed in the past
Open Space (parks, landscape)	Green areas with trees used as shading devices	Green areas with trees used as shading devices	Open space was used for car parking and finished with concrete
Green vehicle Parking (electrical vehicle charging)	Not Present	Not Present	Not Present
Rainwater collection	Not identified	Rainwater is collected on a lake within the resort and used for activities such as kayaking	Not identified
Landscaping	Well defined lawns, presence of hard surfaces for walking and cycling. Presence of plants	Green areas and trees were provided but not well planned and defined	A low percentage of green area, sparse vegetation and trees,
Irrigation (reuse and management of site water)	No gutters or other man-made water drainage routes identified	No gutters or other man-made water drainage routes identified	No gutters or other man-made water drainage routes identified
<b>Based on Surrounding conditions</b>			
Local transport (sustainable transport systems)	Presence of bicycles and quadricycles	Use of an automobile vehicle to transport people from the site entrance to the beachfront	The site is small and needed no means of local transportation.
Integration of building development to the immediate environment.	Buildings were given adequate setbacks	Buildings were given adequate setbacks and a limited number of trees were fell	Buildings were given adequate setbacks and follow the height of surrounding buildings
Daylight access	Presence of windows for interior spaces	Interior spaces are naturally lit	Presence of windows for interior spaces
<b>Based on Natural environment</b>			
Building Orientation	Inclined at 45 degrees which act as a passive	Buildings are uniform on all sides	Inclined along the north-west axis. With longer sides facing the East/West

	means of reduction in solar heat gain		
Conservation of archaeological remains, historic buildings, and monuments on site	Use of locally sourced materials and preservation of culture through sculptures, art and crafts	Use of locally sourced materials and preservation of culture through language, fabrics (Adire) and sculptures.	Use of graffiti and street design as an exterior wall finish
Ecological value and protection (conservation and preservation of habitats)	Preservation of trees, terrain, water body and landscaping	Preservation of trees, terrain, water body and landscaping	Preservation of trees, terrain, water body and landscaping

#### 4.1. Effective Resource Management

Land Use: The beach resorts were developed on virgin land. Huo *et al.* [8] explains that ecologically vulnerable areas should not be developed to reduce environmental impact. Therefore this criterion is poorly implemented because all three beach resorts were developed in natural environments.

4.1.1. *Open Space.* There was a presence of open spaces in the beach resorts. The open spaces were introduced in two of the resorts through green areas and playground, while the third, Atican beach introduced the strategy by the creation of a car park alongside an expanse of land for accommodating an audience during stage performances. This implies that the adoption of open spaces by beach resorts is high.

4.1.2. *Green Vehicle Parking.* None of the beach resorts had green vehicle parking provided.

4.1.3. *Parking Floor Space.* The parking floor space was limited to the entrance of all three developments. This led to the absence of roads within the site which significantly reduced the floor area of paved surfaces on site. The adoption of this strategy can be said to be average.

4.1.4. *Rainwater Collection.* There was no rainwater collection system in place in all three beach resorts. The implementation of this strategy is low.

4.1.5. *Landscaping.* Two out of the three resorts showed a high implementation of landscaping by the design of paved surfaces, green areas and presence of flowers and trees. However, Atican beach resort had poor landscaping this is because of the absence of green on-site, no demarcation between walking paths for pedestrians movement and lawns, absence of trees and flowers on-site. The adoption of this strategy can be said to be high.

4.1.6. *Irrigation.* Irrigation of the site involves the means of disposal and reuse of water. The beach resorts do not have man-made means of drainage for surface water, they rely on the natural means of drainage. This reflects good retention of the natural terrain, however, in times of extreme rainfall this may lead to flooding due to the presence of manmade structures.

#### 4.2 Based On Surrounding Conditions

Local Transport: La Campagne Tropicana provides a vehicle that takes people from the entrance gate to the beachfront where most of the resort activities are located. Whispering palms provides on-site bicycles and quadricycles though limited to a part of the site, it still assists residents in moving around. Atican beach resort has a small land area which eliminates the need for local transportation. The adoption of this strategy is high.

4.2.1. *Integration of Building Development to the Immediate Environment:* The resorts exhibited a good integration to the natural environment by the presence of trees and adequate setbacks between buildings,

which create a more natural environment with good airflow within the site. There is a good implementation of this strategy.

*4.2.2. Daylight Access:* The interior spaces of all the developments have fenestrations provided primarily for natural lighting. The presence of adequate setbacks between buildings also maximizes daylighting due to the absence of shadows. This strategy is well adopted.

#### *4.2.3. Based on Environmental Conditions*

*Building Orientation:* The orientation of buildings in Whispering palms were at a 45-degree inclination which is fair. La Campagne Tropicana utilised chalets which each interior space has windows facing all sides. The Atican beach resort has most of its buildings, including the main hotel inclined in a north-south direction, with the longer sides lying along this axis. This implies that the adoption of this criterion is low.

*4.2.4. Conservation of Archaeological remains Historic Buildings, and Monuments on-site:* All three case studies reflected conservation through Use of locally sourced materials and preservation of culture through art and crafts, language, fabrics (Adire), paintings and sculptures. Therefore all three beach resorts reflected a good implementation of this strategy.

*4.2.5. Ecological Value and Protection:* The beach resorts generally exhibited a good implementation of this strategy. This was achieved through the retention of the natural terrain and trees, water bodies on-site and good landscaping with the provision of lawns.

#### *4.3 Discussion*

The study was carried out to investigate the level of adoption of sustainable site planning strategies, after conducting the research, the results showed that; The adoption of strategies based on effective resource management was low, the strategies majorly implemented in this category were the presence of open spaces and landscaping. The least implemented were the Land use and presence of green parking.

The beach results showed positive results based on the surrounding conditions category, all strategies in this category were properly implemented by them. The most implemented strategy was daylight access. The adoption of strategies based on natural environment category was fairly good. Strategies such as the conservation of archaeological remains, historic buildings, and monuments on-site and Ecological value and protection were discovered to be the most considered within the category while the consideration of building orientation was a poorly implemented strategy. Previous findings show that sustainable site planning as a strategic tool in sustainable development is not one usually considered generally by designers in Nigeria as well as in the National Building Code [12]. However, this study shows that there is a high adoption of sustainable site planning strategies in the design of beach resorts in Lagos. This study highlights that though existing literature has identified the low adoption of sustainable site planning strategies by buildings in Lagos State, there is a relatively high adoption of the strategies in design of beach resorts in Lagos.

#### **5. Conclusion**

Due to the fragility of the ecosystem, there are a lot of changes in climate due to building development especially in coastal development, the study aimed at investigating the adoption of sustainable site strategies in beach resorts in Lagos. The study was focused on three selected beach resorts, La Campagne Tropicana Beach Resort, Whispering Palms Beach Resort and Atican Beach Resort. The results of this showed a generally good implementation of sustainable site planning strategies. The highest adopted strategies are Daylight access, presence of open spaces, landscaping and conservation of cultural heritage. The least implemented strategies are Green vehicle parking, irrigation, land reuse and building orientation.

In a bid to create more sustainable developments, all the sustainable site planning strategies have to be implemented efficiently. Thus, this study recommends that coastal developments, as well other land developments should implement all the strategies including those that have been identified as the least



adopted. The adoption of these strategies can be done through the provision of electric car charging parks and minimise the encourage the use of clean energy such as solar; provide adequate means of site water drainage with consideration to the natural drainage pattern of the site; reuse previously occupied sites for new developments to minimise the rate of expansion into natural vegetation; lastly, designers should ensure the orientation of their building maximises airflow while minimizing heat gain from the sun.

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