IPJ Ibadan Planning Journal
May 2025,
Vol.11, No. 1, 46-54

Ibadan Planning Journal
journal homepage: http://journals.ui.edu.ng/index.php/ipj/issue/view/7

Bottom-Up Strategies for Creating Sustainable Urban Settlements through Sustainable Real Estate Development Practices: A Review

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Abstract

This study explores the concept of sustainable urban design and its significance in achieving Sustainable Development Goal-11 (SDG-11) through sustainable real estate developments, focusing on Lagos, Nigeria. It investigates effective strategies for creating urban settlements by integrating sustainable real estate (buildings) and developing Eco-cities such as Alaro City in Epe, Lagos. An exploratory research method was employed, and key findings highlight the importance of integrating sustainable building design, green spaces, efficient public transportation, renewable energy, efficient water management systems, etc., into real estate development at the planning stage. The study identifies government, architects, quantity surveyors, builders, and individual real estate developers as crucial stakeholders in promoting sustainable real estate developments through the bottom-up approach that will eventually result in sustainable urban settlements. Recommendations emphasize the need for government prioritization of public awareness campaigns and strategic planning, such as giving necessary encouragement and support to local building materials industries. It was equally recommended that certain specific built environment professionals, such as land surveyors, town planners, architects, and quantity surveyors who are the first contact to real estate developers should endeavour to always advise and convince their clients to embrace sustainable real estate design and construction.

Keywords
Bottom-Up, Lagos, Sustainable City, Sustainable Real Estate

Article History
Received 11 Jan. 2025
Accepted Mar. 2025
Published online May 31, 2025

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Declaration of Conflicting Interests
The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

1. Introduction

Over the years, the world has witnessed unprecedented urbanization, with more than half (3.5 billion) of the global population presently residing in cities (UNDP, 2023). Similarly, it has been predicted that about 68% of the world's population will be living in cities by the year 2050 (Bansard, 2022). This rapid urban growth poses significant challenges, including increased energy consumption, increased waste generation, insecurity, environmental degradation, housing needs, etc. In addition, Oke (2023) highlighted the challenges further that 90% of urban expansion in developing countries such as Nigeria will be in hazard-prone areas; 1 billion people around the world live in informal settlements in cities; 500 million city-dwellers are exposed to rising sea levels; and that 1.2 million Km^2 of land will be added to cities via urban sprawl. Consequently, in response to these identified challenges, sustainable urban planning vis-à-vis sustainable real estate development practices has emerged as a crucial strategy to address them in order to create cities that are liveable with properties that are environmentally friendly and sustainable.

To address the global urbanization challenges, the UN-Habitat is encouraging countries to develop urban planning initiatives and strategies to tackle issues such as urban sprawl, geometrical population growth, congestion, poverty, pollution, urban mobility, issue of energy, inequality, and urban biodiversity (UN-Habitat, 2015). According to UNIDO (2016), as urbanization is globally increasing, the need to have sustainable cities is receiving increasing global attention. This is the case in most developing countries, including Nigeria, where there is an alarmingly high urbanization rate with insufficient or inadequate infrastructure and existing systems that can take care of the increasing population in the cities.

This study, therefore, explores the principles of sustainable urban planning, focusing specifically on the integration of sustainable real estate developments (buildings) into the urban sustainability conversation.

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It is aimed at identifying effective real estate development strategies for creating sustainable urban settlements within Lagos State. It would explore the concept of sustainable urban planning and its significance in addressing environmental challenges in urban areas, investigate the concept of Eco-cities, and analyse Alaro City in Epe, Lagos, as a case study of a successful Eco-city project in Lagos that integrates sustainable practices.

The findings and recommendations of this study will have practical implications for policymakers, built environment professionals, real estate developers, and other stakeholders involved in urban development decision-making.

2. Review of Literature

This review seeks to explore existing literature that highlights the strategies for achieving sustainable urban design and property development. Scholars have extensively studied various principles and technologies essential for sustainable development in the built environment as outlined in subsequent sections:

2.1 Concept of Sustainable Urban Design and its Key Components

The rapid urbanization and increasing population densities in cities worldwide necessitate sustainable urban planning and development. Sustainable urban planning involves designing cities to meet present needs without compromising future generations' ability to meet their own. Sustainable cities are safe, convenient, liveable, and prosperous with three key features that are a vibrant street life that enables a variety of activities, promoting walkability to bring people to the public space, and supporting affordability of economic activities such as housing and other needed services (UN-Habitat, 2015). Singh (2023) emphasizes the importance of conserving natural resources and maintaining ecological balance as foundational principles of sustainable cities. This aligns with the broader definition of sustainability, which seeks harmony between economic, social, and environmental dimensions. McIntyre, Ivanaj, and Ivanaj (2019) identified three pillars of sustainability, which are: Social (addressing basic human needs, equity, participation, and social responsibility); Economic (growth, market expansion, cost externalization); and Environmental (carrying capacity, sustainable yield, biodiversity, resource conservation). The three key components of sustainability, according to Singh (2023), are:

i. Economic Sustainability: This involves using local and regional natural resources productively for long-term community benefits without damaging the environment. This aims to balance resource use with the economic development of urban areas.
ii. Social Sustainability: Emphasizes equitable access to physical, natural, and economic resources, particularly for marginalized groups. It focuses on ensuring that urban development benefits all segments of society from top to bottom.
iii. Environmental Sustainability: This component addresses the impact of urban production and consumption on the environment. It includes strategies to manage resource use and minimize pollution and ecological damage.

Consequently, there is an important need to incorporate green spaces as well as green buildings (sustainable real estate developments) into urban environments to have a sustainable living environment. Green open spaces, such as parks, community gardens, and green rooftops, provide numerous benefits, including improving air quality, reducing urban heat island effects, and enhancing biodiversity. The spaces also offer recreational opportunities, contributing to the overall well-being of residents. Furthermore, efficient public transportation systems have been identified as crucial for reducing urban traffic congestion and lowering greenhouse gas emissions. Public transportation options, such as buses with dedicated lanes that make trips faster, trains, cycling lanes, as well as boats for coastal cities like Lagos, encourage the use of sustainable modes of transport over private vehicles, thereby reducing the carbon footprint of cities. It is noteworthy to state that the federal government of Nigeria, and some state governments, have started rolling out CNG (Compressed Natural Gas) powered vehicles and tricycles which is good for the environment.

Renewable energy sources, including solar, wind, and geothermal energy (heat within the earth), are also important. The integration of renewable energy systems in urban planning helps reduce reliance on fossil fuels, decrease air pollution, and promote energy independence. However, policies and incentives to support the installation of renewable energy technologies in real estate (buildings) and public infrastructure are essential for widespread adoption.

The waste management system is another critical element to be focused on for comprehensive recycling programs, composting facilities, and waste-to-energy technologies in the realization of a sustainable urban city. Effective waste management reduces landfill use, mitigates pollution, and promotes the circular economy by reusing materials. Improper and inefficient waste management has

several negative consequences on the environment, which include air pollution, soil and water contamination, thereby endangering the ecosystem etc. The effect could even be flooding of the environment if wastes/refuse block the drainage and various water channels that are meant to channel runoff water to a larger water body. This is one of the reasons why the Lagos State government banned the use of Styrofoam in January 2024, aside from the negative implications of using the material for packaging food.

Apart from the larger environment, the environmental-related issues within the immediate neighbourhood are equally crucial for a sustainable urban environment. In line with this, Sadeghi, Panahi, and Ravaee (2018) propounded the "complete street strategies". The idea is to have a functional and active immediate neighbourhood that is equally environmentally friendly. The study identified the indicators of a Complete Street which translates to a sustainable neighbourhood as; active transportation which includes the improvement of sidewalk infrastructure and consideration of cycling facilities; improving public transportation; traffic calming in consideration of other road users; consideration of motor vehicle users for instance by providing secure, inexpensive, and easy to access parking facilities; availability of environmental (green) infrastructure such as canopy trees along the streets, gardens, drainages, etc. for climatic and mental comfort; and the ease of access to available public utilities and urban infrastructure in the neighbourhood such as access to underground water, electricity or gas lines, etc. It is assumed that these strategies will result in many benefits such as increasing safety, increasing travel options, reducing transportation costs, reducing air pollution, having consideration for all categories of people, including people living with disability, and improving the quality of life.

Globally, nations are promoting new guidelines that can drastically lower the environmental effects of the built environment with the establishment of green building tools that can be used in measuring or assessing a building's environmental effects by assessing the environmental and resource-efficient performance of a real estate development to enhance the building performance and minimize likely environmental impacts from the building construction. Such tools include the SBTool in Canada, BREEAM in the UK, LEED and Energy Star in the USA, and Green Star in Australia and South Africa (Matemilola & Muraina, 2023).

Similar to the complete-street strategies are the five principles promoted by UN-Habitat as strategies for sustainable neighbourhood planning. These are adequate space for streets and an efficient street network; high-density use with at least 15,000 people per square kilometre or 150 people per hectare or 61 people per acre; mixed landuse with at least 40% land space allocated to economic use in any neighbourhood; social mix with the accommodation of all income strata in the neighbourhood; and land-use specialization that combines compatible land-uses into one block and neighbourhood (UN-Habitat, 2015).

After giving adequate attention that can make the neighbourhood sustainable, what follows is the attention given to individual real estate development that makes up the neighbourhood or mini-city. This is adequately considered in Section 2.2 hereafter.

Bansard (2022), however, categorized the actors that can shape urban sustainability into governmental (local, state, and federal governments) and non-governmental actors (businesses, professionals, civil society organizations, schools, research institutions, faith-based organizations, as well as the people). These actors are essential in assisting to achieve urban sustainability through various intended measures such as lobbying to phase out the use of fossil fuel, switching to renewable energy, putting in place mechanisms for the re-use of water, proper waste disposal and waste segregation, appropriate pro-sustainability real estate development design/practices, etc.

In addition to assisting in the enhancement of a sustainable environment, businesses equally engage in sustainable measures to increase efficiency, improve their reputation in the local community, or align with their corporate values. Ditto to some of the other actors.

2.2 Nexus between Sustainable Real Estate Development Practices and Urban Sustainability

An area can only be classified as urban or urban settlements due to the presence of various classes of real estate developments that are inhabited or being used for one purpose or the other by the people. This underscores the importance of the critical assessment of the sustainability of individual real estate developments when planning or assessing the sustainability of an urban area. Real estate in the context of this study is simply land with a building development on it. Such buildings can be for residential, commercial, industrial, institutional, hospitality, health care, religious, recreational, or any other purposes that are essential to enhancing the living conditions of people in an urban settlement.

Sustainable real estate development is synonymous with sustainable property development;

green building; eco-friendly building; circular real estate; as well as a green real estate development (Matemilola & Muraina, 2023). Similarly, sustainable estate development (sustainable mini-city development) owned by an individual or a corporate organization is equally in this category. The process of real estate development has an important link to material resources needed for construction, waste generation during construction, energy consumption, as well as the general impact of the real estate on the immediate environment of the project.

Mohammed and Abbakkyari (2016) propose strategies for achieving sustainable real estate design and construction, emphasizing principles such as Sustainable Site Design, Water Conservation and Quality, Energy and Environment, Indoor Environmental Quality, and Conservation of Materials and Resources.

Sustainable real estate development practice is the act of employing environmentally friendly design, materials, technology, and techniques that can significantly reduce the carbon footprint of a building (Merrill, 2021 during construction, and when the property is in use. Matemilola and Muraina (2023) opined that the built environment is responsible for the emission of one-third of the global greenhouse gases and this surely calls for concern. Consequently, it is germane for the actors in urban sustainable development advocacy to be aware of the important role of real estate when planning for a sustainable environment. It is therefore imperative that in every real estate development, sustainability issues such as energy efficiency through renewable energy, air-conditioning, users' health and comfort, natural ventilation, natural lighting systems, smart front, and roof systems, active and passive thermal comfort systems, photovoltaic panels, etc. (Osmanoglu, 2018) should be accorded high priority. Aside from being needed for the overall sustainability of the urban environment, sustainable real estate is equally efficient in terms of functionality and the mental health of its users.

It is important to state that to assess, measure, or improve the urban sustainability development of some countries, researchers have recently been focusing on the real estate development practices, the building/construction industry, or the real estate sector of such economies (Ala-Mantila, Kurvinen & Karhula, 2023; Baronin, Gushina & Romanova, 2023; Matemilola & Muraina, 2023; Merrill, 2021; Osmanoglu, 2018; Richter, Soliva, Haase & Wrase, 2022; Sadeghi, Panahi & Ravaee, 2018; Santos, 2022). Hence, it is a strategic bottom-up approach to resolving urban sustainability issues.

Notwithstanding, there are certain barriers to the adoption of sustainable real estate development practices. These include government barriers, human barriers, knowledge and information barriers, cost and risk barriers, and market barriers. Out of all the barriers, the study identified cost as the major barrier militating against the adoption of sustainable construction techniques in developed nations, and equally a bigger issue in developing countries. The study estimated that the use of sustainable building techniques can increase construction project costs by up to 20%. This higher cost tends to work against sustainability because of the prevalence of widespread poverty and wealth inequality in most developing countries, such as Nigeria.

Therefore, given the importance of a sustainable environment to all, actors in the urban sustainability conversation in developing nations must look inwards on how to overcome the barrier of cost and other identified barriers peculiar to their environment by employing sustainable, effective, and cost-efficient real estate development practices that resonate with all stakeholders in the real estate sector.

3. Methodology

A qualitative exploratory research design was employed for this study. The design is flexible and adaptable to the methods employed in the study because formal research protocols and procedures have not been strictly utilized (Ogunbameru & Ogunbameru, 2018; Umeh, 2018). Such research sparsely involves using structured questionnaires or any form of probability sampling. In a similar vein, Okot, Hernandez, Zumbado, Lopez, and Navarro (2022) opine that qualitative research describes the state of events as they exist. Hence, the researcher can only report what has happened or what is happening as regards the subject of the study. The research is based on subjective data items that are not numeric, but such data must meet sound logical reasoning. Similar studies, such as Matemilola and Muraino (2023), Santos, 2022; etc. used the same methodology.

4. Findings and Discussions

4.1 Case Study Analysis: Alaro City, Epe, Lagos, Nigeria

Alaro City, an urban development project in the coastal town of Epe in Lagos State, Nigeria, offers a compelling case study in sustainable urban design. It is conceived as a joint venture between Rendeavour, one of Africa's largest city and industrial park developers, and the Lagos State Government. The city is situated on 4,000 hectares within the North-

West Quadrant of the Lekki Free Zone as shown in Figure 1, and it is strategically located in Ibeju-Lekki, a burgeoning area known as the "new Lagos," which is part of the four quadrants of the free zones as designated by the Lagos State government (Rendeavour, 2024).

The city's proximity to major infrastructures like the Lekki-Epe Expressway, the largest Deep-Sea Port in West Africa, and the proposed new international airport further enhances its appeal and accessibility. The Dangote refinery is equally located in Epe, where Alaro city is situated. The city comprises various classes of real estate developments such as residential, commercial, light industrial park, schools, retail malls, logistic properties, etc. Alaro City exemplifies sustainability by integrating key components of environmental, economic, and social sustainability in individual classes of real estate development at the settlement. The city incorporates energy-efficient buildings that minimize energy consumption and employ water conservation systems to manage its water resources effectively.

General environmental sustainability is achieved through extensive green spaces that enhance biodiversity and available recreational areas for residents. It also has a sustainable, independent power plant that uses gas to generate electricity. To ensure effective flood management, city planners have adopted a rain garden system that ensures that the properties in the city are not prone to any form of flooding. Additionally, comprehensive waste management practices that promote recycling and reduce landfill waste exist in the city.

Its economic sustainability is supported by investment incentives, such as zero corporate income tax, zero VAT, and zero customs duties, which attract global and local businesses, fostering economic growth. The city boasts of reliable infrastructure, including power and tele-communication connectivity, which enhances business operations and attracts further investments. Moreover, the development of light industrial and commercial areas creates numerous employment opportunities for the local community.

As for social sustainability, this is emphasized through community engagement, involving the city promoters, real estate developers, urban planners, and residents in collaborative planning efforts that equally encourage the bottom-up strategy. Residential developments like Universal Homes and Talent City provide modern, sustainable living spaces with amenities that support a high quality of life in a sustainable environment. The city's strategic location near key transport routes (water and land) and future infrastructure projects, such as the international airport, ensures connectivity and ease of movement for its residents as well as goods for its businesses.

The city indeed provides a solution to sustainable urban planning (see Figure 2) and city-building problems of Lagos due to its huge and increasing population, having the smallest land area amongst states in the country, as well as its rapid urbanization.

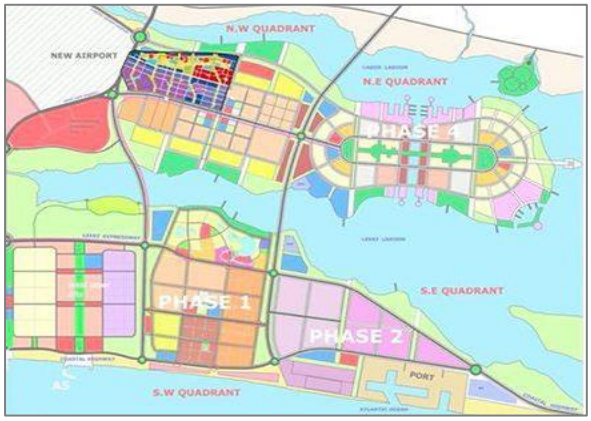

Figure 1: Lekki Free Trade Zone Master Plan showing Alaro City in the North-West Quadrant

Source: Google Maps, 2024

4.2 Strategies for Sustainable Real Estate Development Practices

Whether residential, commercial or for any other use, real estate developments are required to be built with sustainability features and equally fitted for sustainable management practices. Hence, a building should be a product that serves the people, including making the environment sustainable to live in, and not the other way around. A sustainable design is an all-encompassing building design approach that impacts all the phases of a property's life cycle.

To achieve sustainability in real estate development, which will in the long run enhance the general sustainability of the urban settlement, the following practices as adapted from the study of Fontan (2023), are to be considered in preparation for any real estate development within the urban area:

i. *Locate your Real Estate near a Mass Transportation Route:* The real estate development should be located near a mass transit bus park or a train station. This is to allow for communal transportation that can discourage the use of personal vehicles, which could lead to the burning of fossil fuel, which causes greenhouse gas emissions into the environment. In this wise, the Lagos state government should continue to develop mass transit routes that can connect all suburban areas of the state, for residents to be able to develop their real estate developments, especially residential, in any area of the state.

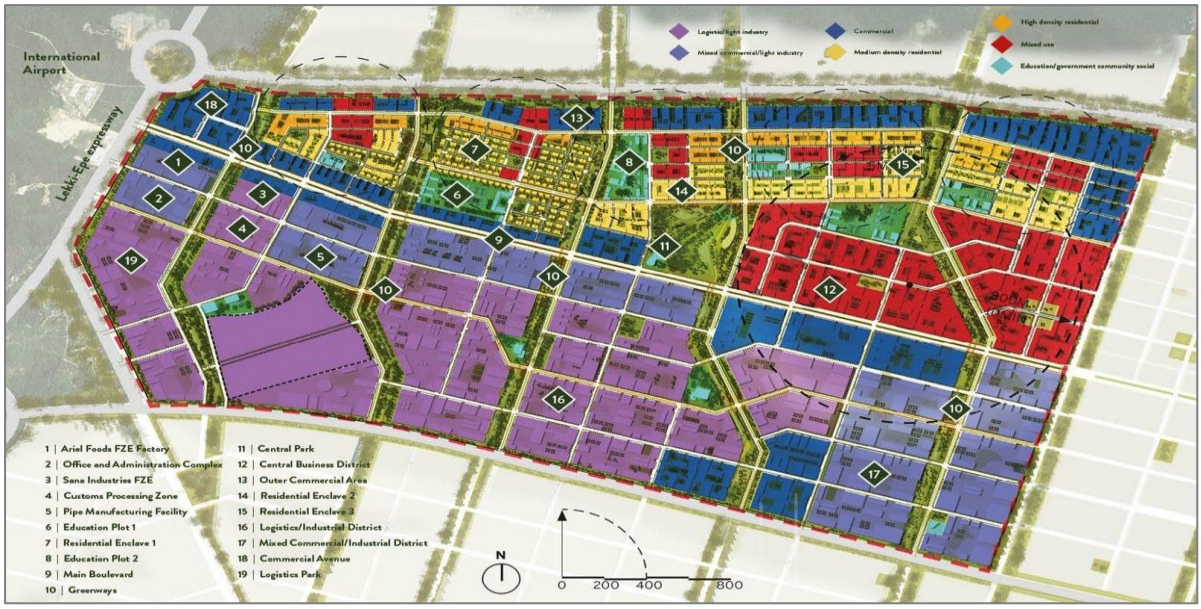

Figure 2: Master Plan of Alaro City
Source: Google Maps, 2024

ii. *Promote Sustainable Transportation with your Real Estate:* The real estate development, whether single or within an estate, should encourage sustainable transportation. For instance, the point of recharging electric or hybrid vehicles should be factored into the building design. If it is an estate, the road design should be able to accommodate the use of bicycles.

iii. *Physical and Mental Health Amenities for Real Estate Users:* The general well-being of all individuals using a property, be it residential, commercial, etc., is very essential in measuring the sustainability performance of a property. Therefore, it may not be out of place to have a gym, swimming pool, or other minor sporting facilities in a real estate development. If it is a commercial or industrial real estate, facilities such as a relaxation hall or a nap room will go a long way to positively impact the mental health of users of such real estate and at the same time raise their morale.

iv. *Maximize the Use of Natural Light within your Real Estate:* Taking advantage of natural lighting during the day within a real estate structure is very important as it reduces electricity consumption, leading to energy efficiency, which is a factor that drives sustainability. The architect should be able to effectively assess the natural lighting orientation of a proposed real estate development to be able to position the building windows and its other light-reflecting elements properly.

v. *Appropriate Real Estate Development Size:* Ensure you maximize the use of space (land and building spaces) and do not build more than what you need. Bigger buildings translate into the use of more resources during construction and when the building is being used. That is, in terms of more financial cost, use of more scarce land resources, use of more building materials, use of more water, use of more energy, etc. One way or the other, this impacts sustainability negatively. Hence, real estate users should only build what will serve their purpose, or to put it succinctly, what they need.

vi. *Rehabilitation of Existing Real Estate:* Another way of conserving building materials, reducing the depletion of natural resources, and ensuring sustainability is to build on an existing real estate development. This means not tearing it down completely (or demolishing it) but retaining some parts that are still strong and useful, and building on them to serve your present need.

vii. *Adaptive Reuse of Real Estate Development:* Again, demolishing a building to construct a new one for another use is not a sustainable idea. Instead of demolishing, such property can be converted to another use entirely when properly re-designed by an architect. This act will lead to the conservation of resources that could be used for the new construction, and it will impact sustainability positively.

viii. *Use of Renewable Energy / Energy Efficient Appliances:* It is very important to consider the source(s) of energy when planning a real estate development because of the importance of electricity to users of properties. Clean energy sources are essential because of their sustainability features. Such sources include the sun (to use solar or photovoltaic panels); the earth's heat (to use geothermal facilities); and wind (to use windmills). It is essential to have any of these sources of electricity when developing real estate in Lagos state because of the epileptic nature of public electricity. Although the use of generators that use fossil fuels such as PMS (a.k.a. petrol) and AGO (a.k.a. diesel) is common as an alternative power source, it impacts sustainability negatively. In addition, energy-efficient electrical appliances such as LED bulbs, energy air- air-conditioners, fridges, water heaters, room heaters, etc., should be encouraged by real estate users. This will reduce their energy need and also make energy costs cheaper in the property. It is equally essential to use electrical appliances with a programmable thermostat. Some properties are designed in such a way that the solar panels for renewable energy will serve the purpose of roof coverings or car-port thereby saving costs.

ix. *Conserve Water:* Water is a very important commodity that is needed daily in a property, and its use seems to be highest in a residential property. Therefore, its conservation is highly necessary for sustainability purposes. A property can be designed in such a way that water can be reused within the property; the property can have "low-flow" bathroom/kitchen installations; it can also have "dual-flush" toilet installations, etc. Unimportant tasks that could result in wasting water should be jettisoned. Similarly, flowers and plants that require much water for survival should not be planted.

x. *Use Sustainable Building Materials:* Building materials that are high in Volatile Organic Compounds (VOCs) should be discouraged. It is also a good, sustainable idea to use recycled materials in property development or to use building materials that can be recycled. The use of locally sourced building materials is equally good for sustainability. Such local building materials include clay, timber, bamboo, laterite stones, coconut fibre in concrete to serve as reinforcement, palm trees, etc. As regards recycling of materials, materials such as metal, plastic, and glass used in a property can be recycled if the property is diligently deconstructed instead of being demolished when it is no longer needed or when it has reached the end of its life cycle.

xi. *Incorporate Sustainable Planting:* It is common to see properties being designed with little gardens on the balcony, on the rooftop or around the building. Vegetables and vegetable crops that are needed by the household can be cultivated on a subsistence scale. Such a garden should not be difficult to maintain, and if on the rooftop or balcony, should not cause structural harm to the property.

xii. *Real Estate Design with Green Roofs and Biowalls:* Green roofs and Biowalls with plants could serve the purposes of aesthetics while also improving sustainability. A Biowall is a botanical air filter that leverages the natural ability of plants to purify indoor air by releasing oxygen (O2) into the atmosphere while taking in carbon dioxide (CO2) and eliminating Volatile Organic Compounds (VOCs) that are released by some building materials. The Biowall can reduce heating, ventilation, and air-conditioning (HVAC) energy consumption by up to 25% for the reason that less air from outside is required for ventilation inside the property. It is equally possible to design a building in such a way that the solar panels for generating electricity can also serve the purpose of the roof on the property.

xiii. *Sustainable Soak-away and Septic Tank Design:* A well-designed soak-away can contribute immensely to sustainable water management through efficient management of soil water, and excess rainwater, as well as prevent flooding. This goes a long way in making the real estate development flood-resilient and environmentally sustainable. Similarly, septic tanks can equally be designed to enhance sustainability through the principle of sewage sedimentation and digestion of sludge. Anaerobic bacteria which are introduced into the septic tank, thereafter decompose the sewage after one or two days.

xiv. *Design a Building with Minimal Maintenance Cost:* When designing a sustainable building, the ease of maintaining it should be of priority. If a building is difficult to maintain because of design or cost, it may increase the deteriorating rate of such property, thereby impacting negatively its sustainability.

xv. *Design and Build to Last Long:* Sustainable real estate should be of good design and

constructed with quality building materials that will last long. This is so as a major feature of sustainable property is for such to last long while also serving its purpose maximally.

xvi. *Build a Real Estate with Great Architectural Design:* Naturally, people will usually like to take good care of whatever they love. Consequently, if a sustainable property is of great architectural design, users of such a property will want to take good care of it by employing a high-maintenance culture.

xvii. *De-construction as against Demolition:* Every real estate developer should be encouraged to design and construct in such a way that at the end of the life-cycle of the property, de-construction can be carried out while the regained building materials can be re-used or recycled. This will lower the pressure on the natural resources that are used in manufacturing such building materials.

5. Conclusion

The study has been able to analyse the importance of urban sustainability to the general well-being of the present generation without jeopardizing the needs of future generations. As several studies on sustainability have been largely focused on urban sustainability (SDG-11), which looks rather huge to achieve over the years, this study suggests the bottom-up approach strategy as well by focusing on individual real estate developers. If every real estate developer, such as the promoters of Alaro City, could factor in sustainability features or practices at the planning stage of their developments, be it residential, commercial, industrial, etc., it would go a long way in impacting the sustainability level of the urban settlements generally.

It is recommended that the government and other stakeholders should step up their advocacy campaign about the necessity of everyone to key into habits that positively impact a sustainable environment. Therefore, the populace has to be enlightened for them to know the ways they can be an agent of sustainability through their real estate developments. For instance, the government can develop low-income mass houses with sustainability features and use the same as an advocacy to encourage the populace to do the same.

Built environment professionals, such as town planners, architects, quantity surveyors, and builders, have major roles to play in selling the idea of sustainable building design and the use of sustainable building materials to real estate developers. This is because they are the first point of contact for the clients. They should be able to advise and convince their clients of the need for sustainable real estate developments. The professionals should equally endeavour to acquire more knowledge on current/modern sustainable building practices because one cannot give what he or she does not have.

It is also imperative for the federal and state governments in Nigeria to encourage the local production of sustainable building materials. This could be through a reduction in taxes of the industries in the sector, reduction in their electricity tariffs, or any other means that can make them continue to produce and equally be selling at lower costs. The government should give much support to such industries.

The government should make it mandatory for real estate developers to incorporate sustainable features in their proposed building design before getting planning approval for such development. And there should be adequate monitoring of the approved design to ensure that the proposed sustainable features are indeed implemented in the developments.

Lastly, all the possible barriers to sustainability, especially 'the cost barrier', should be eliminated.

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