Architecture, Shelter, and the Philosophy of Architecture that Advocates Sustainable Energy Sources and Conservation of Energy: The Case of Green Architecture

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Abstract

The entire world is faced with increasing population numbers and the increases are not without consequences. It must be recognized that increasing population pressure has impacts on the demand for land, its products and environmental challenges facing our planet that resulted in the innovation and introduction of green architecture. The understanding of the meaning of green architecture is different between the people in the advanced (western) world and people in the developing countries. As a result, the aim of this paper is to develop an illustrative report that will graphically explain and start putting in perspective, the meaning of green architecture to the people in the developing countries. Qualitative and quantitative research methods dealing with the issue at hand, "Architecture, shelter and the philosophy of architecture that advocates sustainable energy sources and conservation of energy: the case of green architecture" were adopted. Study conducted by the authors in Abuja, Lagos and Awka, Anambra State on their understanding of green architecture were adopted. 15% of the respondents indicated that it is when a building is painted green. 23% indicated that it is when one or two (1 or 2) pots of plants are placed in a building/roof, 20% indicated that it is when a building is designed to minimize the effects on the built environment while 42% indicated others. Academic institutions in the developing countries should upgrade their academic curriculums to include programmes in sustainability, green architecture and their positive impacts on the natural environments. Those will help in curbing the consequences of over population, urbanization and their pressure on the natural environment hence, the recommendation of this work.

Key words: *Architecture, Shelter, Sustainability, Energy, Green Architecture, Development*

Introduction

Architecture is the total environment made visible (Langer, 1953). But, by whom? And that is the question. As human beings, we have our architecture and animals have their architecture too. However, human beings have, for generations, looked at architecture with interest in human satisfaction and have not given enough attention to animals and their unique architecture. It is not arguable, architecture has always been diversified covering human beings

and their architecture, animals and their architecture, urban areas and the urban architecture that are sometimes, good and sometimes, bad. Good in the sense that, the architecture of the urban areas are good and bad in the sense that, the good architecture of the urban areas are abused, deformed, altered with unwanted and unauthorized additions, structures, littering, dumplings and filled with abandoned and decaying vehicles, security gates, etc. Yet, scholars have from generations to generations, defined architecture to suit the interest of the human beings without adequately addressing the definitions to include animal and urban front architecture (Obiadi, Onochie and Umo, 2019). Agbonome and Obiadi (2015), extensively detailed the definitions of architecture from different perspectives and views and out of their explanations that the present authors extracted greater part of what is presented in this section, as it were an account of a broader view in the definitions of architecture and who the architects are.

Architecture may never be fully defined because the parameters for the definitions are wide and endless. Attempts, however, have been made at defining architecture in the past. A lot of the definitions were based on interests, foci, techniques and materials. The profession of architecture appears to have been cornered by few individuals and groups, qualified as “architects” based on legal interpretation of the word, even when they may not be enhancing the profession.

Architecture evolves in and with time. The evolution implies that architecture changes over time and can be traceable to works produced by previous generations of architects (Brown, 2006). Each epoch offered something new while modifying its antecedents because architecture continues to be influenced by past civilizations even as it captures and midwives the birth of new ideas. From Greek to Roman and Contemporary architectures, the evolution has remained integral, yet there are elements that have remained conservatively canonical. According to CITE (2013), architecture is the art of building in which human requirements and construction materials are related so as to furnish practical use as well as an aesthetic solution, thus differing from the pure utility of engineering construction. Neufeldt et.al (1993), looked at architecture as a science, art, or profession of designing and constructing buildings, bridges, a building, or buildings collectively; a style of construction [Elizabethan architecture] design and construction {the architecture of a beehive}; any framework, system, the design and interaction of components of a computer or computer system. While it is not the intent of this paper to get into the detailed evolution of architecture, it is important to understand architecture, how it progressed and the influences experienced in relation to human environment and technology. As Allegretti (2011), indicated, architecture is not a business, not a career, but a crusade and a consecration to a joy that justifies the existence of the earth. It is certain that architecture has undergone transformations in time and at the same time, has defined many histories, but its primary concern remains the “design and construction of buildings, the style in which a building is designed and constructed, and the complex structure of something (Soanes, 2001). From the Greek perspective, arkhitekton (which draws from all the components from "chief" and "builder, carpenter, mason") can mean: “the art and science of designing and erecting buildings and other physical structures, the practice of an architect, where architecture means to offer or render professional services in connection with the design and construction of a building, or group of buildings and the space within the site surrounding the buildings that have as their principal purpose human occupancy or use; a general term to

describe buildings and other structures; and a style and method of design and construction of buildings and other physical structures" (Teacher, 2014).

These definitions address all aspects of designing human environments and habitation by architects. They present architecture in a broader perspective involving all aspects of design and construction. Architecture is both a process and a product. It is a derivative as well as the process of planning, designing and constructing forms, spaces and the corresponding accommodating ambience. Architecture involves functional, technical, social, and aesthetic considerations (Teacher, 2014). It is a collaborative process where materials, technology, labour and reason interact to create a physical form. The process also involves drawings, specifications, estimation, scheduling, administration and management of construction. These are anchored on the architect who is empowered by law and training to design, supervise the erection of buildings (Dale, 2005). The architects are designing and supervising buildings for human habitation however, the population of almost all the communities around the world are out numbering the provided housing hence, urbanization.

The entire world is faced with increasing population numbers and the increase are not without consequences. According to Barlowe (1986), these consequences that are felt mostly and the concern for the resources to sustain the increasing population is making countries and organizations, devise measures that would control the increasing population. The effects of the increasing population numbers on the sufficiency of food supplies and the maintenance of the quality of local environment can become matters of critical concern. The occurrence of problems this nature in time past has caused some culture to accept population control measures such as sex taboos, delayed marriages, birth control, infanticide, and senicide. Moral restraints now prevent popular endorsement of population control measures that involve the taking of human life; but strong support exists for the acceptance of practices that will check the rate of population increase. He (Barlowe), further indicated that, regardless of the position one takes on the controversial question of population control, it must be recognized that increasing population pressure has important impacts on the demand for land and its products (Barlowe, 1986).

The increasing population of the world is putting pressure on the world's resources and making it impossible for the communities to sustain themselves with the basic provision of food, shelter and clothing. Man obtains his basic needs such as food, clothing and shelter from nature (Gerasimov et al, 1975). He works with nature and uses natural endowments to get the type of shelter, clothing and food he wants; these in turn became a part of his physical environment. Among them, shelter leaves the most visible impact on the built environment, while at the same time its characteristics are influenced by the natural environment. Shelter influences environment in three ways: 1, by consumption of natural resources; 2, by adding physical objects to the environment; 3, by acting as an intermediary between man and nature. Shelter form is determined on the one hand by social norms and practices and on the other by environmental factors such as physiography and climate. Shelter acts in a physical sense as an intermediary between man and nature and in a social sense between man and society. It is a refuge for the tired either in the city or in the village (Mabogunje, Hardoy and Misra, 1976). Refuge, be it housing or office, has huge negative impacts on the natural resources.

House, housing, could be defined as a building to live in, especially by one person or family, a house-hold; a family or dynasty including relatives, ancestors and descendants; the audience in a theatre, a business firm; a legislative assembly; house music, to provide accommodation or storage for; to cover, encase (Geddess and Grosset, 2005). According to Uji and Okonkwo (2007, p17), Turner (1974), sees 'housing' as human dwelling, a roof over one's head meant to serve as shelter for human living, interaction and carrying out of activities away from in clemencies of weather. Uji and Okonkwo (2007) further indicated that, Turner (1974) associates housing with the process of responding to the needs for shelter and the associated demands of social services, health and public facilities which go with the physical shelter in order to ensure congruent living with the environment. Housing generally refers to the social problem of insuring that members of society have a home to live in, whether this is a house, or some other kind of dwelling, lodging, or shelter (Housing, 2013).

Housing however is more than just shelter. Housing is a "process" as stated above and that process has a "product" (Abdulkarim M, 2005). The product is the dwelling units made up of different housing typologies which is not "static". When man needs a change, the product can be modified, renovated, rehabilitated, converted, new ones constructed, and up-graded, etc. (process) to satisfy needs, demands, and supply. The important needs of housing was further underscored by Collins (1976) in Turner's second law of housing, which stated that housing is not what it is, but what it does in people's lives. The human needs that the dwellings units satisfy include; physiological, biological, psychological, social, cultural, political and economic (Abdulkarim M, 2005 and Joseph, 1995).

The concept of housing need in this study is viewed in line with the end draft report of Federal Republic of Nigeria 1991; "as the dwelling units of different housing typologies required to accommodating all households at specific minimum standards or above without consideration whether or not families can pay for it". The concept of housing demand is viewed from two perspectives; (i) in line with the UN Habitat 1991 concept of housing demand; "as the estimation of the number of households that would be willing and able to acquire a particular housing package" and (ii) in line with Abdulkarim M, (2005); "as a measurement of housing units required, hence housing deficit or shortages is seen as equivalent to demand".

The concept of housing supply in the study is viewed in line with Abdulkarim's (2005), concept of housing supply; "as a process involving conventional and non-conventional methods by which houses are constructed through normal institutional channels and are used by owners or offered for sale or not". Whether for sale or not, housing delivery to satisfy the growing world population and help in curbing urbanization negatively impacts the earth's natural resources.

The provision of shelters and the built environments led to the depletion of natural resources and creating unsustainable living for the communities, and the word sustainability is derived from the Latin *sustinere* (*tenere*, to hold; *sus*, up). *Sustain* can mean "maintain", "support", or "endure". Since the 1980s *sustainability* has been used more in the sense of human sustainability on planet Earth and this has resulted in the most widely quoted definition of sustainability as a part of the concept sustainable development, that of the Brundtland Commission of the United Nations on March 20, 1987: "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

Sustainability has been defined in many different ways however, according to the United Nations 2005 World Summit on Social Development, it is the potential for long-term maintenance of wellbeing, which has ecological, economic, political and cultural dimensions that requires the reconciliation of environmental, social equity and economic demands. It is further indicated that sustainability is studied and managed over many scales (levels or frames of reference) of time and space and in many contexts of environmental, social and economic organization. The focus ranges from the total carrying capacity (sustainability) of planet Earth to the sustainability of economic sectors, ecosystems, countries, municipalities, neighbourhoods, home gardens, individual lives, individual goods and services, occupations, lifestyles, behaviour patterns and so on (Sustainability, 2005).

To accommodate the rapid population growth in almost all the communities of the world, urban designers must deal with spatial organization of spaces, and spatial is defined as, relating to space (Geddes and Grosset, 2005). It is conceivable that we might have a region which is not simply characterized by homogenous spatial quality, but is in fact a true spatial region, a structured continuum of spatial form. In a primitive sense, such large urban spaces as river openings are of this nature. A spatial region would be distinguished from a spatial node (a square) because it could not be scanned quickly. It could only be experienced, as a patterned play of spatial changes, by a rather protracted journey through it (Lynch, 1985 p. 105).

Urban design is a bridge between the professions of urban planning and architecture and the primary concern of urban design has been with the physical form of the city. For most of recorded history, architecture and urban planning have shared a concern with overall design of human settlements and the quality of the physical environment. In the twentieth century, urban design has focused on the form of urban settlements and the cultural process which affect those forms (Cantanese and Snyder, 1997). While urban design is trying to midwife between urban and rural living, the architecture of the urban fronts are fast changing, embracing the rural architecture character of taking farming into the buildings in the name of sustainability.

With the quest for sustainable environments, came the new trend in the evolution of architecture termed green architecture. Green architecture, philosophy of architecture that advocates sustainable energy sources, the conservation of energy, the reuse and safety of building materials, and the sitting of a building with consideration of its impact on the environment. In the early 21st century, the building of shelter (in all its forms) consumed more than half of the world's resources, translating into 16 percent of the Earth's freshwater resources, 30–40 percent of all energy supplies, and 50 percent by weight of all the raw materials withdrawn from Earth's surface. Architecture was also responsible for 40–50 percent of waste deposits in landfills and 20–30 percent of greenhouse gas emissions. Many architects after the post-World War II building boom were content to erect emblematic civic and corporate icons that celebrated profligate consumption and omnivorous globalization. At the turn of the 21st century, however, a building's environmental integrity, as seen in the way it was designed and how it operated, became an important factor in how it was evaluated (Wines, 2024).

Depending on the region, green architecture, equally known as green building is designed to reduce the overall impact of the built environment on human health and the natural

environment. It is efficiently accomplished by using energy, water, and other resources in protecting the building occupants health and improving employee productivity at work. This helps in the reduction of waste, pollution and environmental degradation (Green Building, 2016).

The search of space and want for buildable and agricultural lands, led to innovative use of rooftops for agriculture, recreation and eateries in some developed countries major cities. In Boston, Massachusetts, the Fenway Park vegetable garden (Fenway Farms) inside Fenway Park, home of the Boston Red Sox, Boston, Massachusetts, United States of America stood out as a good example. There is an urban farm in Boston growing 6,000 pounds of produce a year. It happens to be located on the roof of Fenway Park, home of the Boston Red Sox, Boston, Massachusetts, United States of America. This is operated by the Green City Growers, Fenway Farms, and it has roughly 5,000-square-foot of rooftop garden area tucked up behind the third baseline at legendary Fenway Park, home to the Boston Red Sox (Bresnahan, 2023).

In a historic move, the Cable Network News (CNN) editor's note, “Call to Earth, an editorial series committed to reporting on the environmental challenges facing our planet, together with the solutions, Rolex’s Perpetual Planet Initiative have partnered to drive awareness and education around key sustainability issues and to inspire positive action towards our environment and the growing challenges. With this intervention and efforts in innovative and creative endeavours erupting around major cities of the world especially, in the utilization and management of the urban spaces for agricultural uses, came green architecture. All kinds of innovative agricultural practices were developed including, planting of vegetables, potatoes, yams, etc., in cement bags. Planting in water and suspended in racks in covered clear tents and canopies. However, among all of them, the most notable is the conversion of rooftops into agricultural lands as seen in Boston, Massachusetts.

The Fenway Park, Boston, Massachusetts, the home of the Boston Red Sox (Baseball club), is known for being green. It is hard not to associate the two, considering the Green Monster, the stadium’s massive outfield wall that has towered over the field since it opened in 1912. The ballpark and its famed wall are painted in a unique shade of green that was even offered to the public by the US paint company, Benjamin More. However, surprising to most people is another green aspect of the iconic baseball venue, spanning a section of what was once an empty black rubber roof. An urban farm introduced there is making Fenway green in a completely different one from the conventional paint green the world knew Fenway Park for. On any given day, farmers from Green City Growers, plant, harvest and maintain the roughly 5,000-square-foot rooftop garden area called Fenway Farms, tucked up on the third floor behind the third baseline (plates 1 to 3).

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Plate 1. An aerial view of Fenway Park shows Fenway Farms in the foreground, against a backdrop of the Boston skyline. Bob Crowley/CNN
Source: Stock Photo Alamy (retrieved March 18, 2024).

Plate 2. An aerial view of Fenway Park shows Fenway Farms in the foreground, against a backdrop of the Boston skyline. Bob Crowley/CNN
Source: Stock Photo Alamy (retrieved March 18, 2024).

According to Bresnahan (2023), with 2,400 total square feet of growing space, the beds can cultivate anything from A to Z (asparagus to zucchini) says Chris Grallert, the president of the Green City Growers, and a local farmer who grew up going to Red Sox games as a kid. Equally, in Boston, local is not new. In 1920, an area in downtown Boston ranked fifth in the nation for values of crops or fruits and vegetables. And all the communities around Boston had local markets and local gardens. Having a rooftop farm at Fenway Park, is an amazing way to be a part of reinvigorating a local food production system.

In the process of growing and expanding green venture, in 2014, the Red Sox organization enlisted the help of Recover Green Roofs, which designed and installed the rooftop garden using a modular growing system with soil-filled lined milk crates. Green City Growers then came in to maintain the farm, which was operational by Major League Baseball's Opening Day in 2015.

Bresnahan (2023), citing Chris Grallert, what we are doing here has been done for 10,000 years or more. We are not flying to the moon. What we need is sunlight, water, soil, drainage, fertility and the basic things that any agricultural system needs. You can really grow anything that could grow on a garden on the ground. We are just taking that system and putting it up on a roof (plates 1 to3).

Plate 3. Fenway Farms is pictured here in late August 2023, when it was flush with eggplant, tomatoes, carrots, onions, and multiple varieties of peppers, beets, greens such as kale and arugula, and herbs like basil.
Source: Stock Photo Alamy (retrieved March 18, 2024).

Impressively, the majority of the products from the rooftop farms stay and were used within the ballpark. Just down the walkway running parallel to the farm, Chef Ron Abell, and his staff across multiple restaurants and concessions at Fenway, use the fruits, vegetables and herbs in dishes served at the ballpark (plate 4).

According to Grallert, the harvest from Fenway Farms reduces the amount of produce the ballpark needs to buy by roughly 20% every year. The chef and the people in the food service concessions here are intimately involved with selecting what crops are grown and how much of the crops are grown. In general, the ballpark produces more than what is needed for the restaurants within the ballpark (plates 4 to 6), and most times, anything extra, along with produce from a designated smaller section of growing space at the neighbouring Vineyard Vines deck, gets donated to a local charity called Lovin' Spoonfuls (Bresnahan, 2023).

Plate 4. Vineyard Vine Club, Boston Red Sox, USA
Source: Stock Photo Alamy (retrieved March 18, 2024).

Plate 5. Vineyard Vine Club, Boston Red Sox, USA
Source: Stock Photo Alamy (retrieved March 18, 2024).

Plate 6. Vineyard Vine Club, Boston Red Sox, USA
Source: Stock Photo Alamy (retrieved March 18, 2024).

In the same vein, the addition of the Fenway Farms has many advantages other than the produce it supplies to the park restaurants and area charity organizations. It acts as insulation to the ballpark itself by cooling the building as much as 15 degrees Fahrenheit in the summer, and

insulating it during cold Boston winters. It attracts visitors to Fenway Park, either on tours, attending baseball games, eating (plate 4 to 6) or other events such as concerts, and the Green City estimates that roughly five hundred thousand children and adults visit Fenway Farms every year (plate 4).

Both the locals and visitors to the Red Sox ballpark are postulated to have psychological effects of the ballpark roof gardens. Looking at cities can give a special pleasure, however commonplace the sight may be. Like a piece of architecture, the city is a construction in space, but one of vast scale, a thing perceived only in the course of long spans of time. At every instance, there is more than the eyes can see, more than the ear can hear, a setting or a view waiting to be explored. Nothing is experienced by itself, but always in relation to its surroundings, the sequences of events leading up to it, the memories of past experiences. Every citizen has had long association with some part of his city, and his image is soaked in memories and meanings (Lynch, 1985 p1).

With that impact, within the ballpark, there is a desire for people to have more locally grown fresh produce and interact with the people who are growing and distributing that fresh produce, and when you have such high visibility, people start to see that it is possible and it can really be the seed to start the new revolution towards food system transformation (Bresnahan, 2023, citing Grallert, 2023), and a new trend in the architecture of cities and the urban areas rooftop farming.

Within the past decades, the architecture of different cities have gone through changes and according to Shane (2011), different urban actors in different periods during the last 60 years worked to create different urban models, using the basic urban elements of enclaves, armature and heterotopias. A beautiful and delightful city environment is an oddity, some would say an impossibility (Lynch (1985 p.2). According to Lynch (1985 p.3), a legible city would be one whose districts or landmarks or pathways are easily identifiable and are easily grouped into an overall pattern and that legibility is crucial in the city setting. Although clarity or legibility is by no means the only important property of a beautiful city, it is of special importance when considering environments at the urban scale of size, time, and complexity. To understand this, we must consider not just the city as a thing in itself, but the city being perceived by its inhabitants (Lynch, 1985 p.3).

Environmental images are the result of a two-way process between the observer and his environment (Lynch, 1985 p.3). There seems to be a public image of any given city which is the overlap of many individual images. The content of the city images, which are referable to physical forms, can conveniently be classified into five types of elements: paths, edges, districts, nodes, and landmarks (Lynch, 1985 p.46). These, make up the city and make people want to keep coming for their pleasant experiences.

According to Cole (2024), sometimes you just need an escape from the hustle and bustle, but you need not travel far to find a gorgeous hideout; we Londoners are innovative folk, placing luscious retreats sky-high above the city. From pretty floral havens to quirky botanical terraces, unique herb nurseries to living bars, delve into our list of best roof gardens in London. Rooftop gardens in London would include, but not limited to the following: the resident Sky Garden restaurant, Darwin Brasseris, London Bridge Rooftop, one of the best free rooftop gardens in London, 601 Queen's Road, Sky Garden, the Candlelit roof garden atop the Brunel Museum,

Skylark Roof Garden, KRAFT, Hackney bar with a chill attitude, Netil 360, Coq D'Argent, the Southbank Centre's Queen Elizabeth Roof Garden, Crossrail Place rooftop garden, Canary Wharf (Cole, 2024) and a list of others.

Statement of Problem

The trend and the understanding of the meaning of green architecture or better said, green building is different between the people in the advanced (western) world and the people in the developing countries. To the people in the advanced world, greet architecture means, the philosophy of architecture that advocates sustainable energy sources, the conservation of energy, the reuse and safety of building materials, and the sitting of a building with consideration of its impact on the environment, while in the developing countries, green architecture simply means, putting a flower pot or two in one's balcony. The level of understanding of the meaning of green architecture differs in both sides of the world and that is the problem.

Aim

The primary aim of the paper is to develop an illustrative report that will graphically explain and start putting in true perspective, the meaning of green architecture to the people in the developing countries and especially, leading to their understanding of sustainable energy conservation, conservation of energy in buildings, reuse of building materials, and consideration of the environment in sitting of buildings.

Research Methodology

The authors primarily adopted qualitative and quantitative research methods, where they carefully analyzed and interpreted works of other authors and used them in buttressing their points as applied to the issue at hand, "Architecture, shelter and the philosophy of architecture that advocates sustainable energy sources and conservation of energy: the case of green architecture."

Findings

As indicated above, the Fenway Park, Boston, Massachusetts, the home of the Boston Red Sox (Baseball club), is known for being green. It is hard not to associate the two, considering the Green Monster, the stadium's massive outfield wall that has towered over the field since it opened in 1912. Being painted green since 1912 has not made the Fenway Park green architecture until 2014, when the Red Sox organization enlisted the help of Recover Green Roofs, which designed and installed the rooftop garden on the roof of the ball Park, using a modular growing system with soil-filled lined milk crates. Green City Growers then came in to farm on the roof (plates 1 to 6). As it is the case in most of the advanced countries green architecture, efforts are made to design the building with emphases in green plants and to maintain the principles of green architecture that included, paying attention to sustainable energy conservation, conservation of energy in buildings, reuse of building materials, and consideration of the environment in sitting of buildings.

Not only that, attention is paid to their weather situations and the use the green architecture in adaptation to their two extreme weather conditions (cold winter and hot summer) is of utmost

important to them. As earlier indicated, the addition of the Fenway Farms has many advantages other than the produce it supplies to the park restaurants and area charity organizations. It acts as insulation to the ballpark itself by cooling the building as much as 15 degrees Fahrenheit in the summer, and insulating it during cold Boston winters. As a result, completing a building and painting it green does not make it a green building or green architecture as it the common understanding in the developing countries.

In a study conducted by the authors of this work in Abuja, Lagos and Awka, Anambra State, Nigeria, 255 questionnaires were randomly distributed to individuals within the building industry, students and estate developers, and each city received 85 questionnaires. The survey tried to understand the communities understanding of the meaning of green building or green architecture. When asked, their understanding of green architecture, what is green building or green architecture? 15%, thirty-eight (38) out of the 255 respondents indicated that it is when a building is painted green. 23%, sixty (60) out of 255 respondents indicated that it is when one or two (1 or 2) pots of plants/flowers are placed in a building/roof of a building. 20%, fifty (50) respondents indicated that it is when a building is designed to minimize the effects on the built environment while 42%, one hundred and seven (107) respondents indicated others (table 1A).

TABLE 1		
1. With your understanding of architecture, what is green building or green architecture?		
Questions	Number	Percentage
A. when a building is painted green	38	15
B. When one or two pots of plants/flowers are placed in a building/roof of a building	60	23
C. When a building is designed to minimize the effects on the environment	50	20
D. Other-please specify	107	42
TOTAL	**255**	**100**

Upon investigating to know which city the 15% of the respondents who indicated that green building or green architecture is when buildings are painted green, 33%, twenty-eight (28) out of the thirty-eight (38) came from Abuja, 12%, ten (10) out of the thirty-eight (28) from Lagos while none came from Awka.

Out of the 23%, sixty (60) out of two hundred and fifty-five (255) who indicated that a building is green or green architecture when one or two pots of plant/flowers are placed in a building/roof of the building, 13%, eleven (11) out of the sixty (60) came from Abuja, 21%, eighteen (18) out of the sixty (60) came from Lagos while 36%, thirty-one (31) out of the sixty (60) were from Awka.

A look into the 20%, fifty (50) out of the two hundred and fifty-five (255) who indicated that green building or green architecture is when a building is designed to minimize the effects on the environment. 16%, fourteen (14) out of the fifty (50) came from Abuja, 42%, thirty-six (36) out of the fifty (50) came from Lagos while none came from Awka.

While investigating the 42%, one hundred and seven (107) out of the two hundred and fifty-five (255) respondents who indicated others, 38%, thirty-two (32) out of the one hundred and seven (107) came from Abuja, 25%, twenty-one (21) out of the one hundred and seven (107) came from Lagos and 64%, fifty-four (54) out of the one hundred and seven (107) were from Awka (table 2).

TABLE 2

1. Where do you deposit your garbage?

Cities	**Number**	**Question 1a**		**Question 1b**		**Question 1c**		**Question 1d**	
		#	%	#	%	#	%	#	%
ABUJA	85	28	33	11	13	14	16	32	38
LAGOS	85	10	12	18	21	36	42	21	25
AWKA	85	0	0	31	36	0	0	54	64
TOTAL	**255**	**38**	**15**	**60**	**23**	**50**	**20**	**107**	**42**

The researcher's field work indicated that the three cities actually have sky bars and restaurants with pots of plants which the respondents took to be green building or green architecture. According to the definition of green architecture as accepted in the advanced world, the researchers were not able to see any structure that meets that standard in the three cities. Although sky bars and restaurants are new in Awka, they are more prevalent in Lagos (plates 7 to 10).

Plate 7. ZAZA Lagos. 19 Agoro Odiyan St. Victoria Island, Lagos 106104
Source: Prince Ehis, Local Guide

Plate 8. 16/16 - design-focused boutique hotel and private gathering space.
Source: Prince Ehis, Local Guide

Plate 9. Lagoon Restaurants. 1C Ozumba Mbadiwe Avenue, Victoria Island, Lagos 106104
Source: Prince Ehis, Local Guide

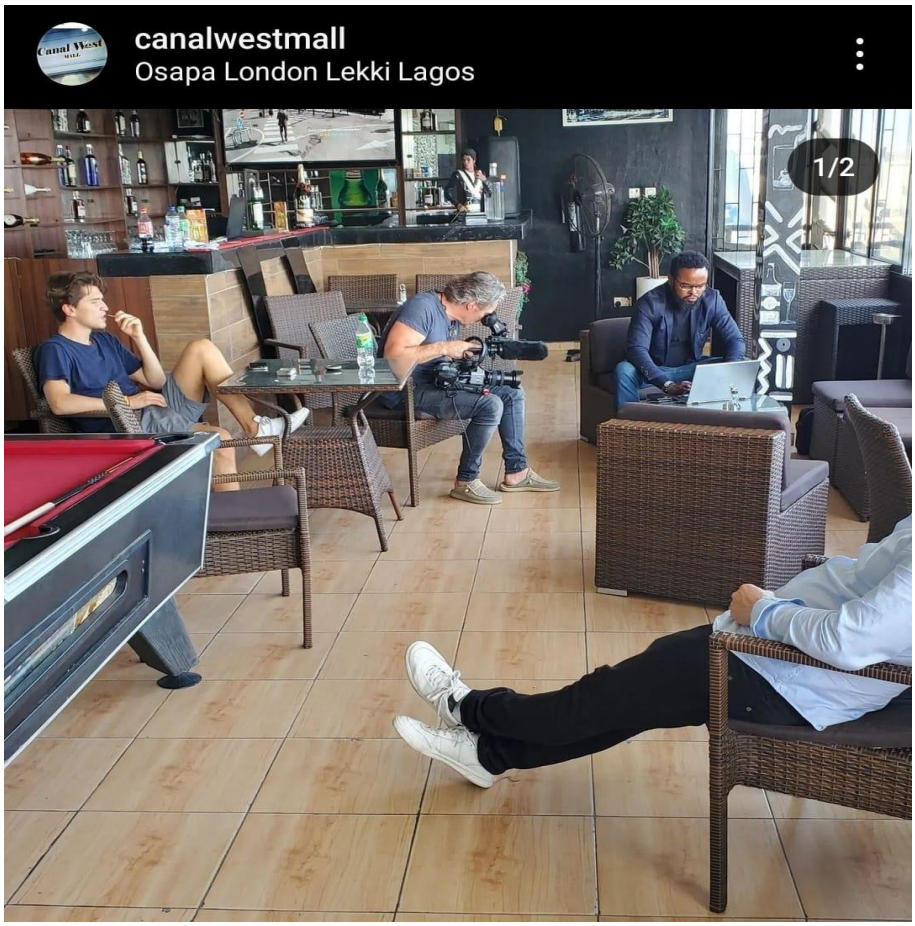

Plate 10. Founders Bar at Canal West Makk, Osapa London, Lekki, Lagos
Source: Tochukwu Obikili, Founders Bar - @thefoundersng

While on the field and discussing with the respondents especially, the 42%, one hundred and seven (107) out of the two hundred and fifty-five (255), who indicated others on the questionnaire, a good number of them were actually confused and believed that a building becomes green or green architecture when green or blue lights are installed in them. A good number of them even returned the question, "What is green architecture?" A good number of the architecture students believed that, a building must be completely covered with plants or synthetic green plants to become green architecture. From all indications, a substantial number of the respondents were confused and worried more about how to maintain the plants in the building than the subject matter, and to them, plants belong to the ground and not on top of the buildings.

Recommendations

Academically, the need to start educating the people in the developing countries on the significance of green buildings or better said, green architecture is there and needed urgently. The depletion of the world's natural resources because of our want for a better living conditions at the expense of our future generations should be of utmost importance to all as a result, the

sustainability of our natural resources, over population, urbanization and demand for more lands must be controlled for a better tomorrow and for our generations to come.

Academic institutions in the developing countries should be encouraged to upgrade their academic curriculums to include programmes in sustainability, which would include green buildings/green architecture, their positive impacts on the natural environments, and the consequences of over population, urbanization and their pressure on the natural environment. These, will lead both the students and housing communities to start understanding sustainable energy conservation, conservation of energy in buildings, reuse of building materials, and consideration of the environment in sitting of buildings hence, the recommendations of this work.

Conclusion

Today, the major threat to human environment is more complex, more closely connected with the very way in which cities are built. For example, the largest cities have grown nearly tenfold in a century. Yet, their consumption of land is greater still because of the ever ending population growth and associated urbanization. To address the problems of over population and urbanization, the services of the building professionals must include the understanding of the earth resources and their management. The architect who is the master in the provision of architectural services, must minimize the abuse of the natural resources and innovatively advance the course of housing provision to minimize damages to land resources.

Architecture however, may never be fully defined because the parameters for the definitions are wide and endless. Attempts, however, have been made at defining architecture in the past. A lot of the definitions were based on interests, foci, techniques and materials. The profession of architecture appears to have been cornered by few individuals and groups, qualified as “architects” based on legal interpretation of the word, even when they may not be enhancing the profession. The urban designers and planner who, plan and design the cities and the urban areas are not much talked about yet, they provide spaces for the architects to design the urban houses.

In all these, the demand for land, provision of land, population problems and urbanization, all have consequences and negatively impacting the earth’s natural resources and the adoption of the green buildings, green architecture will help in understanding sustainable energy conservation, conservation of energy in buildings, reuse of building materials, and consideration of the environment in sitting of buildings hence.

It is important to realize how these pressures resulting from development, on the urban geography mutually reinforce rather than correct one another. Although cities transform resources in ways that contribute strongly to economic development and social welfare, they also generate waste that pollute the urban-human environment and degrade renewable natural resources. A simple fact in this respect is that, though man’s interaction with nature has brought about the formation of urban spaces and centers and their extension, the same process of interaction has also led to the degeneration of the spaces it created. This is an important issue in housing and residential quantity and quality (Okonkwo, 1998: 33-34).

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