



PROMOTING INDIGENOUS ARCHITECTURE TOWARDS A SUSTANABLE GREEN ECONOMIC DEVELOPMENT IN NIGERIA

**¹ODETOYE SUNDAY ADEOLA, ²ABUBAKAR ALIYU MUNKAILA & ³KABIRU ZAKARI
⁴OSUNKUNLE ABDULMAGEED**

¹Department of Architecture, Ladoke Akintola University, Ogbomosho, Oyo State, Nigeria. ^{2,3}

⁴Department of Architectural Technology, Federal Polytechnic, Bauchi, Bauchi State, Nigeria

Abstract

Most of the indigenous architecture are usually made of local construction technology and local construction method which shows a careful thought in this style of building, the choice of materials is readily available and fits our tropical climate. Some of the popular and noticeable architecture are the Hausa, Igbo and Yoruba – the three popular tribes in Nigeria. Due to the current trend of the economic recession, the initiation of this work looks primarily into the concept of providing a low cost home and food security. Architecture and green economy resources showcase buildings that produce plants and animals. The organic technology resources here focus on the production of different high value crops like tomatoes, vegetables, maize, and beans. Other components of the integrated farm include chicken (native and exotic), cow, goat and ram raising with fish culture. The approaches to fertilizer uses, pests and diseases control is purely organic in nature, in which, raw materials come from available farm wastes, indigenous plants and crops that are easily found and grown within the area or nearby areas. However, the need for design, construction and management of such two in one building facilities are too much of a heavy burden to bear due to some circumstances beyond the control of the masses. Hence, the work is aimed at studying the various concepts in achieving sustainable green economy development in terms of how to obtain and use architectural innovations, waste to wealth initiatives, constructions, cutting-edge technologies, principles, laws and regulations among others. As a result of the above, this paper revisits as well as appraises the issues and challenges of architecture and integrated green economy resources for positive implementation and benefits for the masses.

Key words: *Innovations, technology, recession, sustainable and masses*

INTRODUCTION

Before the advent of the Arabs and Europeans to Nigeria, the sophistication of the Nigerian Kingdom was very visible in their peculiar architecture. In a multicultural society like Nigeria, most of the kingdoms had a beautiful and unique architecture that reflected the climate, culture, and beliefs of the people. (Adebayo, 2020). According to Oluwagbemiga and Modi (2014) related that most recent buildings designs across Hausa regions in Nigeria have been built with imported materials and the construction techniques tailored to satisfy the modernity self-ego and aspirations. Thus, traditional architecture ought not to be abandoned and forgotten, hence;

experts' awareness should be tailored to the understanding of its original essence. While Green economy/Agriculture indicates ploughing a field, planting seed, harvesting a crop, milking cows, or rearing of livestock (David, 2014). Agribusiness system has undergone a rapid transformation as new industries have evolved and traditional green economy operations have grown larger and more specialized. National Development means the ability of a country to improve the social welfare of the people by providing social amenities like quality education, potable water, affordable housing, access to food, good transportation, adequate medical care and access to communication, etc. According to the report 'Our common future' by Dr. (Ms.) Gro Harlem Brundtland. First woman Director-General of WHO, sustainable development is defined as development that satisfies the needs of the present without compromising the ability of future generations to satisfy theirs. This report, published in 1987 by the United Nations World Commission on Environment and Development, insists on the need to protect the diversity of genes, species, and all terrestrial and aquatic ecosystems in nature. It therefore recognizes that the three 'pillars'-the economy, society and the environment – are inter connected. Nasiru (2011), reported that transformation actually means a complete change from one situation to another, a total departure from the old order to a new one. Transformation does not come accidentally, but requires deliberate effort. To change from a failure to a successful person calls for performance of some activities that will facilitate the actualization of such dreams, transformation call for practical action and go beyond mere expression or verbal pronouncement, but requires a number of tasks to be performed. Agritecture is the art, science, and practice of incorporating agriculture into the built environment. This integration can be inside of the building (indoor vertical green economy) to maximize the density of growing or outside of it (living walls and rooftop farms) to take advantage of the microclimates that exist through the design of city architecture. Agritecture then is one way of challenging the current industrial scale agriculture by bringing food production to urban, local architectural environments (Association for Vertical Green economy, 2017). Hydroponic green economy can be incorporated into design projects to offer sustainable solutions to future generations and VydroFarm uses fully adjustable tiered racks to accommodate different crops at different growth stages and Valoya LED lights line each tier to provide a high quality light source. Nutrient-rich water is supplied direct to the plants, and ventilation and environmental monitoring equipment all work together to provide the optimum growing conditions to reliably and consistently produce the perfect harvest (Urban Ag News, 2018). The agricultural architecture deals with all the relevant aspects of animals and plants considerations of providing a comfortable space to build and accommodate every living things in the macro and micro environment. The environment is therefore the physical, biological and information sciences (including ecology, biology, physics, chemistry, plant science, zoology, mineralogy, oceanology, limnology, soil science, geology and physical geography (geodesy), and the atmosphere.

A green economy is defined as low carbon, resource efficient and socially inclusive. In a green economy, growth in employment and income are driven by public and private investment into such economic activities, infrastructure and assets that allow reduced carbon emissions and pollution, enhanced energy and resource efficiency, and prevention of the loss of biodiversity and ecosystem services. The role of Green Economy, Sustainable Consumption and Production and Resource Efficiency for Sustainable Development: Sustainable Consumption and Production aims to improve production processes and consumption practices to reduce resource consumption, waste generation and emissions across the full life cycle of processes and products – while

Resource Efficiency refers to the ways in which resources are used to deliver value to society and aims to reduce the amount of resources needed, and emissions and waste generated, per unit of product or service. The Green Economy provides a macro-economic approach to sustainable economic growth with a central focus on investments, employment and skills (UNEP, 2019).

OBJECTIVES

- 1 To identify a reliable connection between the indigenous Architecture and green economy resources.
- 2 To explore the use of indigenous Architecture and green economy resources in the design of structures towards a sustainable development.
- 3 To use of indigenous Architecture and green economy resources as a method of transforming traditional structures into a smart houses.

LITERATURE REVIEW

The combination of the sustainable of Architecture and green economy resources to support national development can never be under estimated. Related studies and literature defines the relevance of the study to the existing cases which can be used as the basis for the design formulation and integration of design theories and practices. Increasing population of hungry and malnourished people, and expected doubling of worldwide demand for food by 2050 as population, incomes, and consumption of animal products grow, necessitate need to support a paradigm shift that focuses energy increasingly on promoting agropreneurs. As agropreneurs through adoption of innovation and assumption of risk of uncertainty improve productivity, transform traditional indigenous agriculture industry into a modern enterprise, and strongly impacts food security, quality of life, economic growth, and political stability (Owoade, 2017).

According to Nasiru (2017), Agribusiness has been defined differently by different authors. It is a concept easy to understand but difficult to define. In simple words "business means the state of being busy". Broadly, business involves activities connected with the production of wealth. It is an organized and systematized human activity involving purchase of goods and service with the object of selling them at a profit. Business concerns buying and selling goods, manufacturing goods or providing services in order to earn profit.

Starting off a business is one of the challenges most aspiring entrepreneurs face. Businesses have different level of risk. Entrepreneurs take risk that is calculated and it is expected of aspiring entrepreneurs to follow suit. Most startups fail because they did not put certain things into consideration which are necessary for business survival and scalability. Some of those things are: doing a thorough feasibility study with market research, getting to know your target customers, going to market with a Minimum Viable Product (MVP), good marketing strategy and tough optimism among others (Kaspharyn, 2017).

Roles of Agropreneurs in Sustainable Rural Livelihood and Food Security The concept of agropreneur or agripreneur represents new breed of agricultural enterpriser who is creative, innovative and enterprising, and whose business motive involves application of scientific and technological knowledge to profitable management of agricultural enterprise (Owoade, Omogoye & Olaniyan, 2011). To put more clearly, an agropreneur is an innovator and a businessman all combined together in one individual. Basically, agropreneurs are involved in agribusiness activities such as manufacture and distribution of farm supplies, genetics and breeding, production and the storage-processing-distribution of farm commodities and the items made

from them. Owoade, (2014) stated that agropreneurs through their active participation in the food and agricultural sector strongly impacts food security, industrialization efforts, quality of life, economic growth, and political stability and, to a certain extent, a nation's position in international relations and trade. He also posited that agropreneurs also turn inherent challenges in the sector to opportunities (wealth and value) through adoption of creativity and innovation and assumption of risk of uncertainty associated with the sector. Specifically some of the socio-economic and technological roles of agropreneurs in sustainable food security and rural livelihood include:

1. Transformation of traditional indigenous agriculture industry into a modern enterprise.
2. Stabilization of rural communities through creation of strategic rural-urban economic turnaround opportunities and sustainable jobs or employment creation.
3. Marshalling the financial resources or mobilizing savings necessary for agricultural value chain development.
4. Reduction of food import bill and saving of foreign exchange needed for development
5. Bearing the ultimate risk of uncertainty associated with agricultural industry.
6. Provision of avenue for the dispersal and diversification of economic activities.
7. Utilization of local raw materials and human resources
8. Wealth creation in the society through improved productivity and accruable income to participating actors in the food and agricultural value chain.
8. Stemming the tide of out-migration (rural-urban drift), a pressing issue in rural Nigeria the agricultural base of the country, through creation of jobs and wealth.
9. Stimulation and adaptation of indigenous technology to modern agricultural system.
10. Adaptation of imported technology to local environment such as the waste to wealth initiatives, such as biofuel and biogas.
11. Development and adoption of appropriate technology to maximize output and sustain production system.

NIGERIAN INDIGENOUS ARCHITECTURE AND GREEN ECONOMY AT A GLANCE

Appropriate applications of Architecture and green economy resources are multifaceted according to Okeke et al.; 2018 are narrated below:

1. **Building Use and Occupant Needs** — Assess the occupant's needs and expected building use to determine the functional design priorities of the building;
2. **Climate Analysis** — Conduct a local climate analysis to determine climactic needs and to assess the potential for passive design strategies;
3. **Site Plan Development** — Perform the preliminary site plan development and landscape design, while considering strategies that can improve occupant comfort, reduce building loads, and further enable passive design strategies;
4. **Building Design** — Proceed with the building design working to meet the occupants' needs and functional requirements of the facility, while incorporating passive design strategies, and being cognizant of the life cycle costs and impacts of material selection and energy use.

METHODOLOGY

In order to clarify issues of Architecture and Integrated green economy resources, the concept, systems, the principles and the technological innovations based on the various applications are

therefore presented. The profiles of leading examples of the each concept as illustrated in a series of outlined pictures show the comparative effects on how to make a comparison among them. The research method made use of primary data sources for a qualitative analysis.

QUALITATIVE ANALYSIS

This section has been analyzed based on sorting out; by using compare (general views) and contrast (specific views) of the respondents as tabulated below in (Table 1).

Table 1 Qualitative analysis of general views and specific views

S/no	Questions	General views	Specific Views
1	Suggest methods used in Architecture and green economy resources for achieving:		
		Advanced plants and animals green economy	Hydroponics, Green houses and Ranching
	Food security?	Evolution of new materials, equipment, furnishing and finishing products especially in agritecture concepts.	Industrialized farm buildings, and cutting-edge technology systems and courtyards
2	How can we apply the above in :		
	Design?	Agric industry, Construction industry	Considerations and determinants of hybrid systems
	Sustainability?	Interactive Agricultural and Architecture for present and future challenges	Sustainable green economy built environment
	Services?	Programmed alert systems for plants, animals and buildings	Programmed farm building maintenance systems
3	List some applications of Architecture and green economy resources.	Aspects roof green economy, wall green economy, and vertical green economy	space management and thinking locally but acting globally
4	What are the advantages and disadvantages of Architecture and green economy resources.?	Fascinates farm building operations and quality farm output, but capital intensive	Achievement of national food security but not easily accessible and may be costly

Source: Researchers' field work, 2022

RESULTS & FINDINGS

The results showed a positive agreement to the fact that indigenous Architecture and green economy resources and systems are useful for operations of advanced plants and animals green economy like Orchard, Hydroponics, Green houses and Ranching. By carefully correlated general and specific views, the similarities shows that there has been useful applications to the present situations in architecture while it has not been applied to the fullest as in the specific views in the recent times but in the future.

POLICY SUGGESTIONS

There is the need in professionalism whereby Architects team up with Agriculturists to produce more of enabling Architecture and Integrated green economy resources, concepts and systems.

- i) More research investigations could be made possible by considering global best practices, sustainability, etc. in future.
- ii) Indigenous Architecture and green economy resources should be introduced as Entrepreneurship Education Development Programmes in the Higher Institutions of learning.

CONCLUSION

This work have allowed for a more accurate knowledge about Architecture and green economy resources from architectural and Agricultural point of view, especially as regards management of resources, space and waste. Most of the developments of traditional and historical Agritecture had undergone transformations which begins with green buildings and hydroponics which often appears to be simple to understand. This entire process of building design that reduces the harmful effects on our health and environment is known as green architecture or green design. Green architecture is a sustainable practice of green building design which is designed and constructed with keeping the environmental standards in mind. Today, we find ourselves at a crossroad on making choices about architectural standards, building materials and new construction, along with the operation and maintenance of buildings, account for a considerable sum of the total greenhouse gas emissions. Knowing this reality, architects are supposed to carry the responsibility of building properties without deteriorating the planet's environmental structure or depleting its resources any further (Samer, 2019).

REFERENCES

- Adebayo, M.A (2020). Pre-colonial traditional Architectures of Nigeria. Retrieved from <https://guardian.ng/life/pre-colonial-traditional-architectures-of-nigeria/>
- Aliyu Mamman (2008). Entrepreneurship Education Development & Poverty Eradication in Nigeria, Joyce Graphic Printers & Publishers, Kaduna, Nigeria.
- Andrew (2016). Agritecture: Fusion of Agriculture and Architecture. Retrieved from <https://www.slideshare.net/atiinteractive/agritecture-fusion-of-agriculture-and-architecture>
- Association for Vertical Green economy (2017). Vertical Green economy, Retrieved from <https://academy.vertical-green-economy.net/intro-to-agritecture>.
- David R.H (2014). Agritecture: Definition and overview, retrieved from doi:[10.1007/978-1-4419-0465-2_64](https://doi.org/10.1007/978-1-4419-0465-2_64)
- Kaspharyn (2014). *How to start as an Agropreneur*, Retrieved from <http://www.agropreneurszone.com/how-to-start-as-an-agropreneur/>
- LASALLE College of the Arts (2015). 'Agritecture', Retrieved from <http://www.thelasalleshow.com/projects/aditya-hukama/agritecture/>
- Nasiru, M. (2011). The Practicality of Agribusiness in Nigeria, Being a Paper presented at Pre-Agm Lecture organised by the Association of Muslim Professionals (AMP), ATBU, Bauchi.
- Oluwagbemiga. P., Modi, S. Z. (2014). Development of Traditional Architecture in Nigeria: A Case Study of Hausa House Form. Retrieved from <https://www.eajournals.org/journals/international-journal-of-african-society-cultures-and-traditions-ijasct/vol-1no-1june-2014/development-traditional-architecture-nigeria-case-study-hausa-house-form-2/>
- Okeke, F. O; Chinwe ,S.A; Okafor, C.; , Andy N. N; Ani, E. K; Okere, C. and Ugwu C. C. (2018). Green Architecture The Nigerian Perspective. International Journal of Agriculture, Environment and BioResearch Vol. 3, No. 06; 2018 ISSN: 2456-8643 www.ijaeb.org Page 341. Retrieved from https://ijaeb.org/uploads2018/AEB_03_281.pdf
- Owoade, O.A. (2014). Nigerian youths and agropreneur development: turning challenges into opportunities, Yaba Journal of Management Studies; 9(1), 110-119.
- Owoade, O.A. (2017). Agropreneur Development: A Framework for Sustainable Food Security and Rural Livelihood; IIARD International Journal of Economics and Business Management, ISSN 2489-0065 Vol. 3 No. 3, Retrieved from <https://iiardpub.org/get/IJEBM/VOL.%203%20NO.%203%202017/Agropreneur%20Development.pdf>
- Owoade, O.A., Omogoye, A.M., & Olaniyan, S.T., (2011). Sustainable reforms towards Emergence of Agropreneurs; The Moulder, 3(2), 167-178. Oyo, Nigeria, 3(2).
- Samer, Z. (2019). Green Architecture and Sustainable Economic Growth in Nigeria. Retrieved from <https://www.thecable.ng/green-architecture-and-sustainable-economic-growth-in-nigeria>
- Urban Ag News (2018). Hydroponic green economy, Retrieved from <http://urbanagnews.com/blog/london-agritecture-sustainability-workshop-to-feature-hydrogardens-vydropfarm/>
- UNEP, (2019). Green Economy. Retrieved from <https://www.unep.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/green-economy>
- Zahner (2008). Tessellate, Retrieved from <http://www.azahner.com/tessellate.cfm>