Global Journal of human-social science: C
Sociology & Culture
Volume 19 Issue 2 Version 1.0 Year 2019
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-460X & Print ISSN: 0975-587X

Hindrances to Vernacular Architecture of Northern Nigeria

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Abstract- Nigeria is a country located in the Western part of Africa. The country is a multinational state with diverse ethnicity of which the three most notable are the Hausa-Fulani, Igbo, and Yoruba; these ethnic groups speak over 500 different languages and share a wide variety of cultures. The Hausa-Fulani are one of the largest ethnic groups in Africa and also a diverse and culturally homogeneous people living mainly in the Sahelian and Sudan savannah region of Northern Nigeria. They mostly live in small villages or towns in Africa, where they grow crops, raise livestock, and engage in trade. The trade influenced political development as ideas (and people) from the Middle East and North Africa made their way south to these cities. Such movements especially due to trades led to an exchange of ideas, cultural practices, and socialization, etc. have a significant impact on the Hausa-Fulani's way of life as confirmed in their traditional building designs and construction processes.

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GJHSS-C Classification: FOR Code: 120199

Strictly as per the compliance and regulations of:

Hindrances to Vernacular Architecture of Northern Nigeria

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Abstract- Nigeria is a country located in the Western part of Africa. The country is a multinational state with diverse ethnicity of which the three most notable are the Hausa-Fulani, Igbo, and Yoruba; these ethnic groups speak over 500 different languages and share a wide variety of cultures. The Hausa-Fulani are one of the largest ethnic groups in Africa and also a diverse and culturally homogeneous people living mainly in the Sahelian and Sudan savannah region of Northern Nigeria. They mostly live in small villages or towns in Africa, where they grow crops, raise livestock, and engage in trade. The trade influenced political development as ideas (and people) from the Middle East and North Africa made their way south to these cities. Such movements especially due to trades led to an exchange of ideas, cultural practices, and socialization, etc. have a significant impact on the Hausa-Fulani's way of life as confirmed in their traditional building designs and construction processes. Such architectural design is referred to as "Tubali" in the Hausa-Fulani language; globally known as Vernacular Architecture. A couple of studies conducted in Nigeria revealed that Nigerians persistently discriminate against indigenous building materials because of doubtful durability and life span, poor social acceptability, as well as lack of well-established standards for these materials. The combination of these challenges further compounds the problems in terms of continuity, development, sustainability of the concept and practice of Vernacular Architecture. This research paper aims to assess and discuss some selected factors hindering the Vernacular Architecture in the northern part of Nigeria (dominated by the Hausa-Fulani tribe) with the view of identifying, evaluating and ranking such factors on how they hinder VANN. The reviewed literature in the VA field helpedp in identifying some factors hindering VANN. The identified factors formed the main body of the questionnaires structured based on a 5-point Likert scale and randomly administered to various construction project professionals practicing in Northern Nigeria's built environment. The resonses are analyzed with the use of Percentage tables; Mean item score/weighted average scores and T-test. The result shows that all the identified factors were agreed by the respondents to Hinder Vernacular Architecture of Northern Nigeria, as is further attested by the hypotheses tested.

Keywords: buildings, factors, hausa-fulani, hindering, northern nigeria, vernacular architecture.

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I. Introduction

a) Background to the Study

Nigeria is recurrently referred to as the "Giant of Africa, "due to its large population and economy, with approximately 200 million inhabitants and also the seventh most populous country in the world with one of the most significant numbers of youths [1][2][3]. The country is a multinational state with diverse ethnicity of which the three most notable are the Hausa-Fulani, Igbo, and Yoruba; these ethnic groups speak over 500 different languages and share a wide variety of cultures [4][5].

The Hausa-Fulani are one of the largest ethnic groups in Africa. They are diverse but culturally homogeneous people based primarily in the Sahelian and Sudan savannah area of Northern Nigeria and southeastern Niger republic. The largest population of Hausa-Fulanire sides in Nigeria and Niger [6].They mostly live in small villages or towns in Africa, where they grow crops, raise livestock including cattle, and engage in trade. These city-states became centers of long-distance trade. The trade influenced political development as ideas (and people) from the Middle East and North Africa made their way south to these cities. Such movements especially due to trades led to the exchange of ideas, cultural practices, and socialization, etc. which have a significant impact on the Hausa-Fulani's way of life as confirmed in their traditional building designs and construction processes. Such architecture is referred to as "Tubali" in the Hausa-Fulani language; globally known as Vernacular Architecture.

Many researchers define the term "Vernacular Architecture" (VA) in many different ways as; the 'idea and technology' of a particular group's method of constructing shelter under the conditions of scarcity of materials and efficient constructional techniques [7]. An accurate reflection of how generality of people want to build and is depictive of their lifestyle [8]. A building made by people in tribal and peasant societies where an architect or a designer is not employed [9]. An architecture that is the outcome of an anonymous design period, and objective environmental surrounding that society forms for itself [10].VA evolved from the experiences of a group of people living under different climatic conditions. It involves the technique of using locally available resources based on the environmental,

cultural and historical background of people [11], [12], [13]. VA is a style of architectures designed base on needs and availability of building materials reflecting the local traditions of a group of people [14]; VA is the local or regional architecture of a group of people [15], [16]. It is also referred to as a constructed shelter of a group of people according to their culture, traditions, beliefs, and environment which is constrained by their climate and locally available materials

In Nigeria, lack of research and government funding coupled together with other factors such as human neglect, socio-economic condition of Nigerians, modernization, discontinuity, and weather and climatic conditions are the major problems hindering or impeding the vernacular architectural practices. A couple of studies conducted in Nigeria also revealed that Nigerians persistently discriminate against indigenous building materials because of doubtful durability and life span, poor social acceptability, as well as lack of well-established standards for these materials [19]. Fatty (2006), also states that in the tropics, only scientific evaluation of new ideas will save its traditional architecture [20]. Earth buildings always suffer from common defects such as surface erosion, partial crumbling, humidity, and hallowed bases [21]. It is apparent that the state of quality control for earth construction hangs in the critical balance with limited tolerance for satisfactory performance; that is why most people use sand-cement wall system because they have been beneficial in term of durability and more tolerant in a tropical environment with competent performances [22]. Hence the need to assess the impacts of the factors hindering and impeding the vernacular architectural practices in Nigeria especially that of Northern Nigeria.

b) Research Aim

This research paper aims to evaluate and discuss some selected factors hindering the Vernacular Architectural practices in the Northern part of Nigeria with the view of identifying, assessing and ranking such factors on how they affect VANN.

c) Hypotheses

To adequately address the research problem and achieve the aim, the following hypotheses were formulated and statistically tested:

- *Null Hypothesis (Ho):* No significant factors are Hindering Vernacular Architecture of Northern Nigeria.
- *Alternative Hypothesis (HA):* Significant factors are Hindering the Vernacular Architecture of Northern Nigeria.

d) Research Methodology

The primary sources of data for this research work are from journals, conference/seminar/ workshop papers, textbooks, newspapers, magazines, and the internet sources, etc., which were used to review literature in the VA field and helped in identifying and discussing some selected factors Hindering VA practices in the Northern part of Nigeria. These formed the main body of the administered questionnaires which was structured based on a 5-point Likert scale of (Strongly Agree – 5; Agree – 4; Neutral / Undecided – 3; Dis-Agree – 2; Strongly Dis-Agree – 1). These structured questionnaires were administered randomly to the various construction project professionals practicing within Northern Nigeria's built environment. The responses were analyzed statistically using simple Percentage tables; Mean item score/weighted average scores and T-square statistics.

II. Literature Review

a) Factors Hindering VANN

Vernacular architecture of northern Nigeria has many unique features which differentiate it from any other form of architecture. Some of these notable features are the engravings carved on the façade of the buildings, use of available building materials such as mud, reeds, stones, and timber within the structures like doors, windows, plastering, and the process of renovations. This feature forms a colorful form of architecture which can only be found in Northern Nigeria [17].

Vernacular Architecture of Northern Nigeria has suffered a great deal from many different factors which include but not limited to:

1. Lack of Funding for Research Works
2. Human Neglect
3. Socio-economic condition
4. Modernization
5. Discontinuity
6. Weather and climatic condition

i. *Lack of Funding for Research works*

Lack of funding for research and development hinders the practices and development of vernacular architecture in northern Nigeria. Researchers are not provided with the necessary financing to integrate innovative design ideas that will provide a better living environment for building occupants. In a world driven by competition in advancement in technology, research has development implications on every nation, so also is the funding. The funding of research in Nigeria has a direct relationship with government allocations to various institutions as well as the priority of the subject area in the government policy. In a world driven by competition particularly in science and technology, Nigeria has remained a consuming society and seller's market. If adequate research is carried out in Nigeria, the nation would be able to develop products and methods of production which would reduce dependence on importation of manufactured goods [23]. A host of factors militate against research in

Nigeria, besides the failure to recognize it as a matter of policy, inadequate facilities – poor equipment, poor libraries, etc., as a result of underfunding [24].

Researches in education and other sectors of the economy rarely attract appropriate government funding which indicates a lack of commitment by government at all levels to the effect that researchers cannot acquire sufficient financial backing. Researches conducted by professionals and associations are usually frustrated due to lack of funds. The annual government budget on education is not enough, let alone provision of research grants to researchers and research institutes [23]. These by extension affects research works in the VA field which covers Traditional, Historical and Heritage buildings, etc.

ii. *Human Neglect*

Human neglect coupled with lack of will by the government, lack of appreciation of cultural heritage and poor acceptability of traditional building materials and method is some of the significant factors hindering the vernacular architectural practices in Nigeria. According to Osasona et al., (2009), due to the lack of apparent political will, Nigeria is yet to come to terms with the cultural implications and economic losses of the neglect of its heritage and vernacular architecture [25].Mostly traditional architectural element had been forgotten and even ignored [26].The discrimination against earth building has reduced the impact of Government efforts in empowering private housing sector [27].

There is the issue of conservation and preservation policy at the root of much of the decay of Nigeria's heritage structures. All over the geographic sprawl of the nation, samples of buildings-ranging from local traditional, through legacies of colonial occupation and facilitation, to locally hybrids each physically interesting, historically and culturally significant and thus worthy of preservation[25].

This entrenched negligence (resulting in trivializing evidence of the nation's material culture) has been the result on the one hand, and misplaced value on the other. Apart from Government's inactivity and the Ancient Monuments Society (AMS), generally the populace occupies itself with a more pressing issue of employment and the provision of food and basic shelters for families and individuals. Various Faculties of Architecture have frequently observed the neglect of heritage buildings. In 1999; an attempt was made to intervene, however minimally, on some buildings, to stem the tide of inevitable degeneration [25].

iii. *Socio-economic condition*

Egentiet al.,(2014) states that the durability of traditional building materials explains the reason for a cold shoulder from the financially strained Nigerians thereby forcing them to employ the use of the e expensive building materials like sand-cement blocks, which are widely known for durability, reliability and pleasant aesthetic effect. It also shows that Nigerians consider the owners of modern building as superior and economically stable than those with traditional structures. The proud owners of these new cement buildings were respected and placed high in the society [27].

A study survey conducted by Alagbe (2011) aimed at examining the relationship between people's knowledge of compressed stabilized laterite earth block and the acceptability of housing construction, the survey revealed that the acceptability of compressed earth block is dependent on durability and adequate promotion and enlightenment campaign by the public and private sectors in Nigeria[28].The use of traditional materials like earth, straw, bale, and stone, to be accepted overall mainly to scrap its offensive/derogative image as material for the poor[29].

With increasing problems of poverty, dwindling resources, and unfavorable economic atmosphere, architects should be encouraged to return to local traditional materials and technologies and through creativity and innovation came up with better ways of building. The major impediments in the campaign for earth, straw, bale and stone buildings are in their property value as economic commodities. Even though the client may be persuaded to build with such technologies, there is the likelihood that these houses may be priced lower by estate managers given their relative newness and complexity in real estate market in Nigeria [29].

iv. *Modernization*

In Nigeria, modernization is one of the significant factors that affect vernacular architecture; one of these factors are acceptance of earth as a modern building material. Egentiet al., (2014) identified that the durability of earth walls as one area that attracted the most concern from the public and emphasized the importance of addressing this problem for the earth to gain acceptance as a modern building material [30]. Modernization and societal advancement somehow had downgraded these practices of using traditional building materials in favoring the machine intensive, unsustainable building practices which are now being slowly re-evaluated [31].

With the coming of cement industries, expanded construction opportunities gradually relegated the traditional construction methods. The use of cement became an excitement with an impressive finish, durability and waterproof/ washable surfaces for floors and walls. It was a progressive and positive development in the human shelter and living conditions-product of science and technological development [27]. In term of construction, it is significant to state that the use of earth when compared with burnt bricks or the cement blocks; consumes less energy to make and consumes far less cement in instances where applied

for both the brick and mortar. On the other hand, this method of constructions should not eliminate concrete or any other material where necessary [29]. The experimental housing project using straw, stone, and earth among many others substantially shows that stone, straw, bale and particularly earth can easily be used as modern material to build at least two-story residential buildings [32].

v. *Discontinuity*

Discontinuity has been one of the significant factors that affect vernacular architecture in Northern Nigeria; some of the notable effects are the disappearance of the artisans and master builders which acquired the skills that are mostly passed down through generations. Egentiet al., (2014), stated that the old earth buildings associated with natives are gradually disappearing as illustrious sons and daughters of these families are replacing them with modern structures. Where there is no means of restoring the buildings, natives have traded them to commercial banks for good fortune and companies who desire them because of their strategic locations [27]. This disappearance of buildings forced the artisans to evolve and start using modern building materials.

Many of the traditionally significant buildings of the earth have weathered badly and are partially derelict. Instead of being progressively maintained, most have been abandoned entirely or had their cultural significance transferred to modern structures [25].It is apparent that the state of quality control of earth as building material hangs in a critical balance [27].

vi. *Weather and climatic condition*

Various geographical regions of this world have different climates which form the basis for the use of available materials for building construction, and Northern Nigeria is no exception. Northern Nigeria, covered by the Savanna region (Sahel, Guinea, and Sudan Savanna) has alternating Wet and dry seasons. The rainfall in this region is less than 1000mm per annum in only about five months in a year, especially between May and October. The rainfall intensity is very high between July and August [34].

UNCHS Habitat (1986), observed from the field of experiences that majority of world's earth houses in rural areas suffer from common defects identified as surface erosion, partial crumbling, unhealthy conditions due to constant humidity and hollowed bases [35]. The microclimate of heavy driving rain in most parts of Africa and the low level of infrastructural development like the irregular supply of electricity makes building planning difficult [27].

Climate forms part of determinant factors that led to the development of traditional architecture in northern Nigeria. These climatic factors include temperature, wind, and humidity. The climate of Northern Nigeria calls for design solutions that can improve the effects of excess day lighting, heat, rainfall, midnight cold and other factors[36]. The Hausa-Fulani builders have all along considered the impact of climate in determining their architecture. The climatic condition of Hausa-Fulani land has reasonably been constant, whereas available technology, durability of building materials, and economy is dynamic and thus, have changed. People have found more natural ways of doing things, with the availability of the building materials that perform against weather and climatic conditions. However, globalization had its toll on Hausa-Fulani traditional architecture as it has done on other traditional architecture worldwide. To combat the onslaught of weather and climate, the conventional features of architecture are fast disappearing [27].

Thus, the weather and climatic conditions hinder VANN through surface erosions, wear and tear of the buildings, constant humidity, and moisture from underground, partial crumbling, hollowed bases, and heavy and erratic rainfall.

III. Data Presentation and Analysis

a) Results from the Administered Questionnaires

The primary data for this research work is obtained through manually distributed questionnaires to the various construction project professionals practicing within Northern Nigeria's built environment. These include but not limited to: Architects, Quantity Surveyors, Civil Engineers, Project Managers, and Construction Managers, etc. The responses obtained are shown in table 1 below.

Table 1: Questionnaires distributed with responses

Questionnaires	Frequency	Percentage
Returned and Usable	350	58.33%
Returned but Incomplete	29	4.83%
Non-Returned	221	36.83%
Total	600	100%

Source: Authors' 2017; Fieldwork

The table above shows that:

i. Six hundred questionnaires (600) were manually distributed, and 379 (representing 63.17%) were retrieved, while 221 (representing 36.83%) are not recovered.
ii. Three hundred fifty (350) questionnaires (representing 58.33%) were complete and usable whereas 29 (representing 4.83%) were incomplete.
iii. As such, the response rate was reasonable.

The respondents are various construction project professionals practicing in Northern Nigeria's built environment. These include but not limited to: Architects, Civil Engineers, Construction Managers, Project Managers, Quantity Surveyors, and others, etc. The responses acquired by discipline is shown in table 2 below.

Table 2: Respondents' Professional Disciplines

S/N	Professional Disciplines	No. of Questionn aires Distributed	No. of Questionnaires Returned and Usable	Percentage (%) of Questionnaires per discipline
1	Architects	100	72	20.6%
2	Quantity Surveyors	100	53	15.1%
3	Civil Engineers	100	51	14.6%
4	Project Managers	100	61	17.4%
5	Construction Managers	100	64	18.3%
6	Others	100	49	14.0%
	Total	600	350	100%

Source: Authors' 2017; Fieldwork

The table above shows that Architects have the highest response rate with 20.6%, followed by Construction managers with 18.3%, Project managers 17.4%, Quantity surveyors with 15.1%, and Civil engineers with 14.6% while other professionals' (Mechanical and Electrical Engineers, Surveyors, Estate Managers, etc.) have 14%.

The assessment of the factors Hindering VANN based on a 5-point Likert scale of (Strongly Agree – 5; Agree – 4; Neutral / Undecided – 3; Dis-Agree – 2; Strongly Dis-Agree – 1) is shown in table 3.

Table 3: An Assessment of the Factors Hindering VANN

S/N	Factors Hindering VANN	Strongly Agree	Agree	Neutral / Undecided	Dis-Agree	Strongly Dis-Agree	TOTAL	Mean Item Score
		5	4	3	2	1		
1	Lack of Funding for Research works	116	130	60	31	13	350	3.87
2	Human neglect	135	116	53	29	17	350	3.92
3	Socio-economic condition	140	145	41	12	12	350	4.11
4	Modernization	176	111	31	27	5	350	4.22
5	Discontinuity	109	106	80	43	12	350	3.73
6	Weather and climatic conditions	104	99	72	36	39	350	3.55

Source: Authors' 2017

The mean item score (weighted average) values were analyzed based on the range (from 4.5 – 5.0 is Strongly Agree; 3.5 – 4.4 is Agree; 2.5 – 3.4 is Neutral / Undecided; 1.5- 2.4 is Dis-Agree; 0.5 – 1.4 is Strongly Dis-Agree) to allow for a remark for each of the identified Factors Hindering Vernacular Architecture of Northern Nigeria as shown below:

Table 4: Remark and Ranking Factors Hindering Vernacular Architecture of Northern Nigeria

S/N	Factors Hindering VANN	Mean Item Score	REMARK	Ranking
1	Lack of Funding for Research works	3.87	Agree	4th
2	Human neglect	3.92	Agree	3rd
3	socio-economic condition	4.11	Agree	2nd
4	Modernization	4.22	Agree	1st
5	Discontinuity	3.73	Agree	5th
6	weather and climatic conditions	3.55	Agree	6th

Source: Authors' Fieldwork.

From the above table, all the six identified factors were agreed by the respondents to Hinder Vernacular Architecture of Northern Nigeria.

Modernization which causes the replacement of the Vernacular buildings with new ones constructed with modern building materials was ranked first which is due to the discrimination against indigenous building materials, social class factor, and fear of durability of traditional earth buildings. The socio-economic condition was ranked second; this is due to the lack of strength of conventional building materials which explains the reason for a cold shoulder from Nigerians that are financially strained, with limited resources, and the high cost of maintenance of Traditional buildings.

Human neglect was ranked Third; this is mostly due to lack of will from the Government, cultural implications, Government inactivity, lack of appreciation of such buildings by the general public, and non-education of the owners of these buildings about the effect of losing these vernacular architectural buildings to the cultural history of Northern Nigeria. Lack of research and funding was ranked fourth by the respondents; this factor is due to lack of adequate policy in the allocation of funds by the government, inadequate facilities and scarcity of research-minded fellows.

Discontinuity was the factor ranked fifth; this is due to the availability of qualified artisans and master builders, lack of will to use traditional building materials, biological degradation and loss of cultural significance and value of earth buildings. Weather and climatic conditions were ranked sixth and last by the respondents; this is due to surface erosions which caused by heavy and erratic rainfall, the partial crumbling of the traditional building caused by moisture from underground. These indicate that this factor is the least hindering VANN as attested by the various construction project professionals practicing within Northern Nigeria's built environment.

b) Hypotheses Testing

The formulated hypotheses work was tested using T-test statistics. The mean item scores obtained from tables three and four above is used for the statistical computations with the result shown in table five below.

Table 5: Testing of Hypotheses

Factors Hindering VANN	MEAN	Standard Deviation	Standard Error	N	DF	Alpha (level of Significance)	P-value	Tcal	Ttab0.05, 5
Six Identified Factors	3.901	0.2431	0.0993	6	5	5%	0.0000	14.1189	-2.0150

Source: Authors' 2017; Statistical computations

From the computation in the table above it can be gathered that; With 5- degrees of freedom (DF) and 5% level of significance, the value of the T-test calculated (Tcal=14.1189) is greater than the value of T-test tabulated (Ttab0.05, 5= -2.0150). As such, the Alternative hypothesis which states that; Significant factors are Hindering the Vernacular Architecture of Northern Nigeria was accepted.

IV. Conclusions

This research work identified six factors hindering VANN based on the reviewed literature, which forms the main body of the questionnaire distributed to various construction project professionals practicing within Northern Nigeria's built environment. These include Architects, Civil Engineers, Construction Managers, Project Managers, Quantity Surveyors, and others. Six hundred questionnaires were manually distributed, and 350 questionnaires (representing 58.33%) were complete and usable whereas 29 questionnaires (representing 4.83%) were incomplete, while 221 (representing 36.83%) were not recovered. As such, the response rate was good. Architects score the highest response rate with 20.6%, Construction managers18.3%, Project managers 17.4%, Quantity surveyors 15.1%, Civil engineers 14.6% while other professionals' (Mechanical and Electrical Engineers, Surveyors, Estate Managers, etc.) have 14%Among the respondents.

The respondents agreed with all of the identified factors of modernization, socio-economic condition, Human neglect, Lack of Funding for Research works, discontinuity, weather and climatic conditions as factors hindering VANN;

V. Recommendations

The following recommendations were proffered:

1. There is a need for extensive research work on the Vernacular Architecture of Northern Nigeria by the indigenous scholars especially on the Historical aspects of the ancient and traditional buildings. These may open up some interesting indigenous elements of the VANN
2. There is also a need for further extensive studies to examine the impact of each of the identified factors on how it hinders Vernacular Architecture.
3. Further research is required to maximize the durability of the traditional building materials in Northern Nigeria.

References Références Referencias

1. Nigeria: Giant of Africa, by Peter Holmes 1987.
2. ^The CIA World Fact Book 2014. Sky horse Publishing, Inc. 2013. ISBN9781626360730.
3. ^Library of Congress – Federal Research Division (July 2008). "Country profile: Nigeria" (PDF): 9. Retrieved28 December 2011.
4. Ethnicity in Nigeria". PBS. 5 April 2007. Retrieved 9 May 2015.
5. ^"Nigeria's Identifiable Ethnic Groups". Online Nigeria. Otite, O. Retrieved 9 May 2015.Check date values in: |date= (help).
6. Zango FM". Retrieved 4 November 2015.
7. Porphyrios, D., 2006. Classicism is not a style. In: Jencks, C. and K. Kroopf, (Eds.), Theories and Manifestoes of Contemporary Architecture. 2nd Edn., John Wiley and Sons Ltd., Sussex, pp: 179-180.
8. Osasona, C.O., The concept of the "traditional" in African architecture (Chapter 2). Principles of Traditional Culture, ed. M. Okediji, BARD Books: Ibadan, pp:18-25, 1992
9. Oliver P., 2006, Built to Meet Needs Cultural Issues in Vernacular Architecture. Elsevier Ltd., Oxford, UK. 2006.
10. Kagan Gunce, & Zafer Ertuk & Sevic Ertuk., Questioning the "prototype dwellings" in the framework of Cyprus traditional architecture, available online at www.Sciencedirect.com., Elsevier Ltd. 2007.
11. Oliver P. Encyclopedia of Vernacular Architecture of the World. Cambridge University Press,; 1997 pp 14.
12. S.S Chandel, V. Sharma & B.M. Marwah., Review of energy efficient features in Vernacular Architecture for improving thermal comfort conditions, available online at www.Sciencedirect.com.
13. Oliver P. Earth as a building material today. 5. Oxford Art J Arch,; 1983. Pp 2.
14. URL: Wikipedia.org accessed 10/29/16
15. Glassie, H. (1990), Architects, Vernacular Traditions and Society, Traditional Dwellings and Settlement Review Vol, 1, No 2 (spring), 9-21. Retrieved in August 17 from; http//www.jstor.org/stable/2356 6248.
16. Kirbasand Hizli, 2016., Learning from Vernacular Architecture: Ecological solutions in traditional Erzurum Houses., available online at www.Scien cedirect.com., Elsevier Ltd. 2016.
17. I. I. Danja, Xue Li and S.G. Dalibi (2017): Vernacular Architecture of Northern Nigeria: A Review. International Journal of Scientific & Engineering Research, Volume 8, Issue 3, March-2017 ISSN 2229-5518
18. I. I. Danja, Xue Li and S.G. Dalibi (2017): Vernacular Architecture of Northern Nigeria: A Review. International Journal of Scientific & Engineering Research, Volume 8, Issue 3, March- 2017 ISSN 22 29-5518
19. Adogbo, K.J., Kolo. B.A., 2006. The perceptions on the use of the indigenous building materials by professionals in the Nigerian building industry. Ahmadu Bello University Zaria
20. Fatty H., 2006. Natural energy and Vernacular Architecture. In: Jencks, C. and K. Kroopf, (Eds.), Theories and Manifestoes of Contemporary Architecture. 2nd Edn., John Wiley and Sons Ltd., Sussex, pp: 144-145.
21. Heathcote, K.A., 1995. Durability of earth wall buildings. Constr, Build. Mater. 9 (3), 185-189
22. C. Egenti, J.M. Khatib, & D. Oloke., Conceptualization and Pilot Study of Shelled Compressed Earth Block for Sustainable Housing in Nigeria, 2014. Publication source, 2212-6090/c 2014 the gulf Organization for research and development.
23. Chikwe, Christian .K., Ogidi, Reuben .C., and Nwachukwu, K. Challenges of Research and Human Capital Development in Nigeria Journal of Education and Practice
24. P.A. Donwa: Funding of Academic Research in Nigerian Universities UNESCO forum on higher education, research and knowledge 2006
25. C.O Osasona,. F.O. Ewemade. Upgrading Ille-Ife's vernacular architecture heritage. WIT Transactions on the Built environment, V109, 2009 WIT Press, ISSN 1743-3509.
26. H.G.A. Ibrahim. Regeneration of sustainability in contemporary architecture: approach based on native function and activities strengthen identity. Urban planning and architecture design for sustainable development, UPADSD 14-16 October 2015.
27. C. Egenti, J.M. Khatib, & D. Oloke., Conceptualization and Pilot Study of Shelled Compressed Earth Block for Sustainable Housing in Nigeria, 2014. Publication source, 2212-6090/c 2014 the gulf Organization for research and development.
28. Alagbe, A.O,. 2011. Enhancing sustainable housing development in Nigeria using compressed stabilized laterite bricks. J. Sustainable Dev. Environ prot. 1,3.
29. O. Ejiga, O. Paul, O.O. Cordelia. Sustainability in traditional African architecture: a springboard for sustainable urban cities. June 2012. Sustainable futures: architecture and urbanism in global south Kampala, Uganda 27-30 June 2012.
30. Heathcote, K.A., 1995. Durability of earth wall buildings. Constr. Build. Mater. 9(3), 185-189.
31. Khalil, N. (1999) Ceramic houses and earth architecture, how to build your own, california: cal Earth press.
32. Adamu, M.S.T (2005): 'interpretation of significant and messages in Hausa traditional architecture. Case of ''zaure" entrance hall. Journal of

association of architectural educators in nigeria. Vol4, No 1. January –March, 2005. Pp10-21'.
33. Anuforum, A.C. and J.N. Okpara 2004. The influence of variability and climate change on agricultural production in Nigeria. European metrological society annual meeting abstacts. Vol. 1,00449
34. Anselm E.O, & O. FAti., 2010,. The influence of rainfall on Hausa traditional architecture. Research journal of applied science, engineering and technology. Maxwell Scientific organization 2010.
35. UNCHS Habitat (1986). Earth construction technology: Manual on surface protection. Nairobi: UNCHS (Habitat).
36. O.P. Agboola & M.S. Zango. (2014) Development of traditional architecture of Northern Nigeria; A Case Study of Hausa house form. International Journal of African Society Culture and Traditions. Vol.1, No 1, pp 61-74, June 2014.