

Review of selected features of hausa vernacular architecture Case study of Dakali and Zaire in Jos, Plateau State, Nigeria

N. A. Umaru¹, S. T. Adamu¹, M. M. Bello², Babatunde Adekoyejo Jolaoso^{3*}

¹Department of Architecture, Faculty of Environmental Sciences,
University of Jos, Plateau State, Nigeria

²Department of Architecture, Faculty of Environmental Technology,
Abubakar Tafawa Balewa University Bauchi, Nigeria

³Department of Architecture, School of Environmental Studies,
Moshood Abiola Polytechnic, Abeokuta, Nigeria



ARTICLE INFO	ABSTRACT
<p><i>Article history:</i> Received November 18, 2022 Received in revised form Dec. 19, 2022 Accepted December 29, 2022 Available online December 31, 2022</p> <p><i>Keywords:</i> Conservation Dakali Heritage Preservation Vernacular architecture Zaire</p> <p>*Corresponding author: Babatunde Adekoyejo Jolaoso Department of Architecture, School of Environmental Studies, Moshood Abiola Polytechnic, Abeokuta, Nigeria Email: koyejolaoso@gmail.com</p>	<p><i>Hausa Vernacular architecture is informed and shaped by cultural and religious values, wherein, Dakali and Zaire are unique features that plays a pivotal role. Cities are metaphorically described as historically solidified environment in time and in space. Thus, depicting physical, archival and artefacts of the past and present, from which it develops the future of human civilization and cultures set in a time series continuum. Hausa vernacular architecture is gradually getting evolved through modern trends by renewing, re-ordering and replacement of these features. Therefore, there is the need for studies to be carried out extensively on or before adaptation, adoption and implementation of evolving trends, in order to conserve and preserve the Hausa man's cultural and religious values in their architecture. The paper seeks to draw attention towards the preservation and conservation of indigenous heritages through vernacular architecture, especially with the examples from the characters of Hausa architecture, without arguing for a complete reversal to the past life styles, value and techniques that would neither be out-of-place with emerging trends and acceptability of modern technology nor be balkanized. Information was essentially extracted from relevant literature on the subject matter; adopts purposive sampling and content analysis method in the selection of study area and sample size; as well as, in the extraction of features of Hausa vernacular architecture respectively. This was complimented with field survey in the form of interviews, observation and case study. Results therefrom were discussed and descriptively presented. Findings revealed that, the identified features have remained prominent and continued to perform their expected functions. The paper conclude by underscoring the need to stimulate awareness, rejuvenate and regenerate the Hausa/Fulani vernacular architecture and cultural-heritage perceptibility through creative and integrative use of architectural designs and planning concepts and skills that will be sensitive to the rebirth of cultural symbols, relics, configurations, ornamentations as symbolic expressions depicting history, branding and conveying one message or the other, about the inhabitants for better understanding and conservation of fun-memories of the cultural/traditional values and heritages.</i></p>

Introduction

Vernacular architecture has been described as a reflection of historical, cultural and environmental setting. It has been expressed to be indigenous with specific time or place; integrates and combine local climatic conditions, locally available materials, simple construction techniques, traditions, living style, as well as the socio-economic conditions of a region. Thus, a relationship between ecological, material, economic and social factors (Rashid 2015; Auwalu 2019). The Hausas, sometimes interchangeably referred to as Hausa/Fulani, are culturally homogeneous people that dominates the northern part of Nigeria between latitude 3.50° East to latitude 11.0° East, and from longitude 10.50° North to longitude 14.00° North. Their vernacular architecture has a special aura around them. However, their architecture is perhaps one of the least known most beautiful of the medieval age with a fast-varnishing features, due to the influence of foreign taste/value and modernization by replacing the old buildings with new ones thereby forgetting its traditional architectural heritage (Gali Kabir Umar et al. 2019; Agboola and Zango 2014; Isa Ibrahim Danja, Li, and Dalibi 2017; I. I. Danja, Li, and Dalibi 2017; Auwalu 2019).

Since architecture is essentially geared towards meeting the needs of man and to satisfy its quest for aesthetics, therefore, a building is not an end in itself, it rather serves as a means to an end, which in turn, it is to satisfy the material and spiritual needs of the people; and thus, no good architecture can originate without paying respect and having semblance of or symmetry with the society in which it is situated (Dmochowski 1990; Chokor 2005). It implies that, architecture without provision for cultural and spiritual needs of the people is not a good architecture. Therefore, the concept of heritage conservation as a contemporary development is becoming significant in modern architecture, because of the faster pace in the development and redevelopment of towns and cities (Bello and Jolaoso 2017). It is in this stead, Bello and Jolaoso (2017) observed that, ancient and/or historic buildings are assuming a great risk in contemporary houses, with the development which has evolved demand for knowledge of antiquity that seems disappearing. It further implies that, this day,

heritage retention is largely driven by the criticism of the lack of sense of place and identity associated with new developments and there is the need to exploit resources for economic purposes. Paradoxically, cities are metaphorically described as historically solidified environment in time and in space. Thus, depicting physical, archival and artefacts of the past and present, from which it develops the future of human civilization and cultures set in a time series continuum.

The aim of this paper, is to draw attention towards the preservation and conservation of indigenous heritages through vernacular architecture, especially with the examples from the Hausa architecture, while its objective is to stimulate awareness, encourage and promote this area of architecture but not necessarily to argue for a complete reversal to the past life styles, value and techniques that would not fit into the trending and emerging acceptability of modern technology without balkanizing the essence of the understanding and conservation of memories of the Hausa traditional values and heritages.

Definition of terms

Birni is contextually referred to as a City (Gali Kabir Umar et al. 2019; Bilyaminu 2017).

Birane is contextually referred to as Cities (Gali Kabir Umar et al. 2019).

Gari is contextually referred to as a Town (Gali Kabir Umar et al. 2019).

Tsakiyar Gari is contextually referred to as a Central core (Olotuah and Olotuah 2016).

Wajen Gari is contextually referred to as an Outer core (Gali Kabir Umar et al. 2019).

Kofar Gida is contextually referred to as a Forecourt (Olotuah and Olotuah 2016).

Cikin Gida is contextually referred to as a Central courtyard (Abiodun et al. 2016).

Turuka is contextually referred to as a Bedroom (Olotuah and Olotuah 2016).

Shigifa is contextually referred to as the Second Entrance Hall (Olotuah and Olotuah 2016).

Dandali is contextually referred to as the Traditional Hausa house open space (Bikam and Chakwizira 2020).

Zauruka is contextually referred to as Entrance Halls/lobbies or foyers i.e. plural of Zaure (Abiodun et al. 2016; Bikam and Chakwizira 2020).

Zaure is contextually referred to as an Entrance Hall, Lobby, Foyer (Bilyaminu 2017).

Falo is contextually referred to as a Living Room (Gali Kabir Umar et al. 2019; Noma, Bakr, and Sayad 2022; Ajufoh and Abubakar 2019).

Bayangida is contextually referred to as the Toilet (G. K. Umar 2017).

Dakin Girki is contextually referred to as the Kitchen (G. K. Umar 2017).



Figure 1. Hausa traditional housing layout plan
 Source: (Bamalli 2018)



Plate 1. The forecourt zone (*Kofar Gida* showing the *Dakali* and the *zaure*, the main entrance hall)



Plate 2. Hausa architecture
 Source: (Bamalli 2018)



Plate 3. Passerby resting on *dakali*
 Source: (Bamalli 2018)



Plate 4. *Dakali* and *zaure* entrance
 Source: (Bamalli 2018)



Plate 5. Conceptual modern hausa architecture with modern materials
Source: (Bamalli 2018)

Hausa/Fulani as a tribe, is a collection of diverse and socio-culturally homogenous people of the northern part of Nigeria, bound together by common language, history and traditions, shades of dialects and large population, their geographical spread notwithstanding. They are mostly located in the northern part of Nigeria and constitute one of the largest African ethnic groups of the Sahel regions, which stretches across the Capitals of neighboring African countries like the Republics of Mali, Niger, Cameroun, Chad, Benin, Ghana (*Kumasi*), etc. The Hausa/Fulanis are generally known to be religious, which governs their life and conduct. Their settlements/habitations, clothing, foods, dance and music always reflect their belief, culture and traditions which are often expressed in images/symbols on their buildings and structures.

Their architectural design styles/concept, configuration, planning typology, symbolic expressions and ornamentations on their buildings became popular as means of expressing geographical location, cultural/traditional values, socio-political-economic status of the owners and users. It has been observed that, westernisation, acting as social force, has played no small role in de-emphasizing the significance of the African traditions and value system. Thus, the traditional practice is threatened by exposure to foreign tastes/western ideas and ways of life which have in turn eroded many of the old knowledge and native intelligence, especially the technical know-how on how to develop and use local materials to meet the modern time (Bello and Jolaoso 2017). In the same vein, Munoz (2003) also observed that, the tradition of the people has been seriously neglected, such that tradition is often seen and treated as exact opposite of modernism or modernization, which western ideas depicts or

symbolises; and that, justice is seldom done to the centrality of tradition as a concept, especially in areas of architecture and in reflecting the dynamics at shaping people's lives in the modern concept of designing buildings and structures for them. Yet, it is important to move beyond considering this important idea as representation of residual concept or as simply a tangential starting point in the development process of a people. However, events have over the years revealed that, urban regeneration, urban renewal, demolition, modification and replacement exercises have brought about a great degree of threat to the preservation and conservation of inherent Hausa/Fulani vernacular architecture in Nigeria.

Some selected features of hausa vernacular architecture of Northern Nigeria

Dakali, zaure, kofar gida, cikin gida, and shigifa are some of the selected features of Hausa vernacular Architecture of the Northern Nigeria for the purpose of the study. According to Gali Kabir Umar et al. (2019), Architectural expression like a language is frequently evolving into new forms and materials in contrast to the characteristics of past styles or building concepts and techniques. Auwalu (2019), the predominant tribes of Hausa-Fulani's occupy the Northern region. I. I. Danja, Li, and Dalibi (2017) asserted that, vernacular architecture of the northern Nigeria has many unique features which distinguishes it from any other. Olotuah and Olotuah (2016) corroborated the need for domestic privacy and safety for the inhabitants is a cogent factor informing the spatial planning of the traditional Hausa house. The natural domestic architecture of the Hausa/Fulani is a vivid element of their physical and spiritual culture. Their house forms express the collective aims and desires of their communities for an ideal environment suited for their communal lifestyle rather than individual goals. The culture of the Hausas is greatly influenced by Islam, which is the dominant religion practiced by the majority of them. Therefore, a typical layout plan is essentially of two houses in one, the outer male visitors' reception area and the restricted area for the women. This clearly defines the public and private areas of the house, which is highly respected by the public (Schwerdtfeger 1982 in Olotuah and Olotuah (2016)).

In a typical Hausa dwelling, there are two main zones, the forecourt zone (*kofar gida*) and

the central courtyard zone (*cikin gida*). The forecourt is an intermediate zone between the centre of the compound and the public domain. Before reaching the central courtyard zone (*cikin gida*), someone has to go through complicated entrance-ways (the *zaure* and *shigifa*) which blocks direct access and views into the interior of the compound. There exists a feature called Dakali, which is the first reception area for male guests which is mostly located at the forecourt zone (*kofar gida*) (see figure 1, plates 1, 2, 3, and 4). Therefore, for someone to get to central courtyard zone (*cikin gida*), he/she require to pass through the *zaure*, which serves as a reception room, as well as the main entrance hall, beyond which male visitors are not allowed but female visitors can proceed thereon into the central courtyard zone (*cikin gida*) through a second entrance hall (*shigifa*), (Olotuah and Olotuah 2016; Ajufoh and Abubakar 2019).

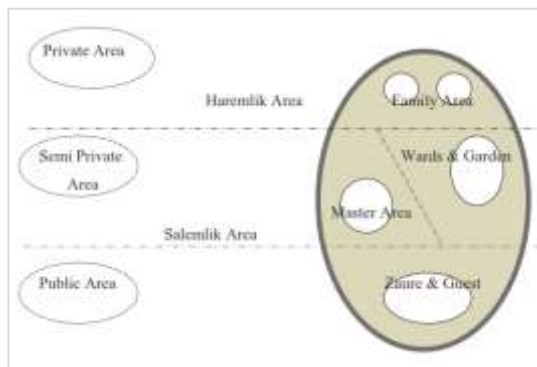


Figure 2. Conceptual typical hausa layout plan
Source: (Gali Kabir Umar et al. 2019)

The *dakali*

This is usually located outside of the house at the forecourt. It is used sometimes for evening relaxation (Zhang and Yusuf 2018) and also serves as place for entertainment and reception activities, especially for occasions such as weddings “*fatiha*”, naming ceremony and other social celebrations. At some other times, it serves as a picnic/playground for children and as resting area for others from the household(s) and passersby. Sometimes, it is used in the early hours of the mornings for the purpose of observing related therapy or administering related prescribed dose of the morning sun to acquire a vital vitamin often referred to as vitamin-D, when the sun has risen; and for eating the evening meals or at social engagement between males and females after the sunset (Abiodun, et al 2016; Gali

Kabir Umar et al. 2019). The *dakali*, when used as a structural function, it serves as a buttress-cum-retaining wall, thereby supporting, sustaining and upholding the wall(s) in place at both sub and super structural levels.

The *zaure*

In an Islamic design principle, it requires seclusion and privacy for women in residential design. In that regard, the dwellings are divided into two major areas namely: the front area contextually referred to as the *Zaure*, which belong to the master of the house and the *cikin gida* (the inner room spaces) are usually exclusive to the female and the close family (Agboola and Zango 2014). Auwalu (2019) describes it as the main entrance hall opening to the street. Gali Kabir Umar et al. (2019) claimed its major functions include security and access control, protection, reception, privacy, moral, ethnic ideas, decorations and administration. It serves also as a foyer and general circulation space (Adamu 2005 in Agboola and Zango (2014); Bilyaminu (2017)). It opens to the street but creates a separation between the outside public zone and a private inside zone for the family (Auwalu 2019; Gali Kabir Umar et al. 2019). It is an important space due to the security and control measures it offers to the compound and the family. According to Zhang and Yusuf (2018), it is usually the only way in and out of a Hausa home. G. K. Umar (2017) concluded that, it is interestingly a utility circulation space.

Auwalu (2019), the *shigifa* is a smaller inner *zaure* used as a more private male social space where the house head can relax in private with intimate friends and members of his family. It opens into the inner courtyard (*cikin gida*) of the compound. It also functions as a reception and entertainment area specially for the male father (*mai gida*) to his close and intimate friends and some other female visitors. It also serves as his relaxation space. The foregoing has been aptly captured by the description of *Zaure* as a multi-purpose space that symbolizes the man’s social-religious level of social acceptance and religious compliance (Osasona (2007) in Agboola and Zango (2014); and by the position of Noma, et al (2022)), affirming its function as a reception and entertainment area, pre-function lobby as well as an entrance hall.

Method

Information was essentially extracted from relevant literature on the subject matter by expert (published and unpublished), drawings, pictures, architectural models/imageries, field survey and observations from case studies. Purposive sampling and content analysis method were adopted in selecting the study area, sample size (buildings), and in extracting the array of features of Hausa vernacular architecture respectively. This was complimented with field survey through opinion polls in the form of interviews, observation and case study conducted on samples selected by stratified random sampling method. Google map software was used to generate images of the study area which was adapted for the purpose of detailed field studies. These images were used to reconcile the total number of buildings as established from the illustrations in figure 2. Digital camera was also used to snap and capture detailed vernacular features from the case

studies, as well as GPS device to pin-point the exact location of the selected samples for the case studies. While well-structured questionnaire was administered on a face-to-face format for quick and instant data collection. Graph paper and pencils were used to sketch the forecourt of the selected samples (case study) in order to establish the vernacular features under study. Results were thereafter discussed and descriptively presented.

Study area

The study area is a section of the old Jos city centre known as the *cikin gari*. This part of the city is predominantly inhabited by the Hausas/Fulanis. It is denoted by the red lines (line-dash-dot) in figure 3. The area is mainly used for residential purposes. It is bound on the west by Bauchi road, to the north by Mango street, to the east by *Masallacin Juma'a* street and to the south by the Jos-North Local Government Area secretariat, Fire Service Station and Dogon Agogo.



Figure 3. Google image of the study area

Populasi

The area has a total of twelve (12) streets/roads. They are Bauchi Road, Mango Street, Masallacin Juma'a street, Shehu street,

Balarabe street, Yandoka street, Turaki street, School line, Dankarfalla street, Muhmmadu Borno, Audi Street and Bakano street all in the Jos city centre of Plateau State, Nigeria. There are

about 22 buildings under construction which are uninhabited due to their state of either dilapidation or collapse, as well as open/undeveloped site in the study area. Using the satellite image generated from googlemap and on-the-spot physical counting of the buildings in the study area, there are 260 buildings representing the study population from which the study samples were derived.

Samples

Using the generated image and on a street-by-street format, six streets were selected on a stratified random option on street/road alignment

on north-to-south axis. Furthermore, in a discriminating order, two buildings were further selected on either side of the street at alternate formation.

Result and discussion

From the twelve (12) streets/road contained on the mapped out on the study area were selected by stratified random sampling method as tabulated hereunder for the collection of relevant data, extract and discuss information therefrom.

Table 1. Status of building(s) in the study area

No	Streets	Total No. of buildings	No. of building(s) in use	Building(s) under construction	Building dilapidated/collapsed (not in use)	Open or undeveloped site (No. building)
1	Bauchi road	15	15	2	-	-
2	Mango street	18	18	1	-	1
3	Masallacin Juma'a street	12	12	-	-	-
4	Shehu street	7	7	-	-	-
5	Balarabe street	27	26	1	1	2
6	Yandoka street	30	30	-	-	2
7	Turaki street	29	29	1	-	1
8	School line	27	26	3	1	1
9	Dankarfalla street	34	33	1	1	-
10	Muhmmadu Borno street	26	26	2	-	-
11	Audi street	28	28	1	-	-
12	Bakano street	7	7	-	-	-
Total		260	257	12	3	7

Table 1 illustrates the results of the field study, indicting total number of buildings within the study area. However, due to alterations or accretions over time, a number of buildings with vernacular features became drastically reduced arising from the influence of foreign taste/value and lack of integration with the development of modern technology. Hence, the birth of transitional changes to the emerging trends and the fizzling identity of the Hausa vernacular architecture. The layout of some of these sampled-buildings, though may still have the *Zaure*, but configured in a slightly modified format, with the attendant reduction in the expected functional values. The *Dakali* as a feature, in some cases did not provide for the desired functions as conceived, designed and constructed, due to alterations/accretions or modernization especially along the streets experiencing road construction, which was

brought about by the raised driveway and the concomitant sunken/dwarfed appeal to the seating level.

Case studies

Total of seventeen case studies were selected by stratified random sampling method (see plates 6–21). The identified vernacular features of the Hausa architecture were studied thereof. It was observed that both the *Zaure* and the *Dakali* are in various sizes, forms and layout which have undergone transformation arising from alteration and/or accretions, thus fizzling in the character of Hausa vernacular architecture, loss of preservation and conservation of heritage values.



Plate 6. Picture of case study 1. Location: Turaki Street, Jos



Plate 7. Picture of case study 2. Location: Balarabe Street, Jos



Plate 8. Picture of case study 3. Location: Balarabe Street, Jos



Plate 9. Picture of case study 4. Location: Yandoka Street, Jos



Plate 10. Picture of case study 5. Location: Yandoka Street, Jos



Plate 11. Picture of case study 6. Location: Turaki Street, Jos



Plate 12. Picture of case study 7. Location: School Line Street, Jos



Plate 15. Picture of case study 10. Location: Dankarfala Street, Jos



Plate 13. Picture of case study 8. Location: School Line Street, Jos



Plate 16. Picture of case study 11. Location: Dankarfala Street, Jos

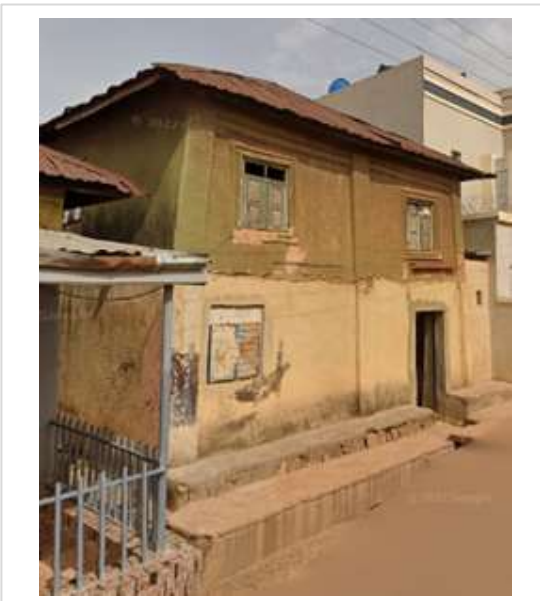


Plate 14. Picture of case study 9. Location: Dankarfala Street, Jos



Plate 17. Picture of case study 12. Location: Dankarfala Street, Jos



Plate 18. Picture of case study 13. Location: Muhammadu Borno Street, Jos



Plate 20. Picture of case study 15. Location: Audi Street, Jos



Plate 19. Picture of case study 14. Location: Muhammadu Borno Street, Jos



Plate 21. Picture of case study 16. Location: Audi Street, Jos

Conclusion

In Hausa vernacular architecture both *Dakali* and *Zaure* remained unique features that seems not only to serve their designed functions but they have helped in conserving and preserving their cultural and religious beliefs system. Their transformation is however, is inching into it, through the adoption of some foreign value/tastes and modern trends. In some instance, these

features have been gradually evolved through alterations, re-ordering and replacement.

Modernization and technology have the capacity of bringing about changes in all aspects of human lives and endeavours. This has no doubt affected the Hausa vernacular architecture and will continue to do so. The Hausa man, been dynamic in nature, can re-adjust, adopt and adapt to these changes and influences. This paper has therefore, revealed the need to stimulate awareness, rejuvenate and regenerate the Hausa/Fulani vernacular architecture and cultural-heritage perceptibility through creative and integrative use of architectural design and planning concepts that is sensitive to the rebirth of cultural symbols, relics, configurations, ornamentations as symbolic expressions depicting history, branding and conveying one message or the other about the inhabitants, their socio-cultural and socio-economic environment. This will significantly provide opportunity for the understanding and conservation of fun-memories of the cultural/traditional values and heritages.

Recommendation

In as much as change have remained the only constant in life and architecture been no exception, therefore, changes will require careful study, review and modification before adoption. However, certain architectural features notwithstanding, must be conserved, preserved and retained to sustain the people's cultural and religious heritage.

References

- Agboola, Oluwagbemiga Paul, and Modi Sule Zango. 2014. 'Development of Traditional Architecture in Nigeria: A Case Study of Hausa House Form'. *International Journal of African Society Cultures and Traditions* 1 (1): 61–74. www.ea-journals.org.
- Ajufoh, Michael Onyemaechi, and Abdullahi Bilkisu Abubakar. 2019. 'Evaluating Effects of Globalization on the Morphology of Hausa Traditional Architecture: A Case Study of Bauchi House Forms'. *International Journal of Env. Design & Construction MGT.* 10 (4): 334–47. https://www.hummingbirdpubng.com/wp-content/uploads/2020/06/MIJECM_334-347.pdf.
- Auwalu, Faisal Koko. 2019. 'Exploring the Different Vernacular Architecture in Nigeria' 7 (1): 1–12. www.eajournals.org.
- Bamalli, Uthman Hannafi. 2018. 'Rethinking & Resuscitating Hausa-Land Domestic Vernacular Architecture (Gidajen Hausa) A Study of Hausaland Adobe Architecture (Tubali)'. https://www.academia.edu/42806081/RETHINKING_and_RESUSCITATING_HAUSA_LAND_DOMESTIC_VERNACULAR_ARCHITECTURE_A_STUDY_OF_HAUSALAND_ADOBE_ARCHITECTURE_TUBALI.
- Bello, O. A., and B. A. Jolaoso. 2017. 'Character-Extinction of Yoruba Architecture: An Overview of Facades of Residential Buildings in South-Western, Nigeria'. *Journal of Emerging Trends in Educational Research and Policy Studies* 8 (3). <https://journals.co.za/doi/abs/10.10520/EJC-b391bd047>.
- Bikam, Peter, and James Chakwizira. 2020. 'Influence of Traditional Settlement Patterns on Urban Design and Planning: A Case Study of Zaria, Nigeria'. *Urbani Izziv* 31 (2): 66–77. <https://doi.org/10.5379/urbani-izziv-en-2020-31-02-001>.
- Bilyaminu, Musa. 2017. 'Modern Architecture in Nigeria and It's Trends in Historical Buildings: Failure of Modernist in Conservation and Restoration of Historical Buildings'. *International Journal of Architecture and Urban Development* 7 (3): 5–8. <https://www.sid.ir/en/Journal/ViewPaper.aspx?ID=699620>.
- Chokor, Boyowa A. 2005. 'Changing Urban Housing Form and Organization in Nigeria: Lessons for Community Planning'. *Planning Perspectives* 20 (1): 69–96. <https://doi.org/10.1080/0266543042000300546>.
- Danja, I. I., Xue Li, and S. G. Dalibi. 2017. 'Vernacular Architecture of Northern Nigeria: A Review'. *International Journal of Scientific & Engineering Research* 8 (3). <https://www.ijser.org/researchpaper/Vernacular-Architecture-of-Northern-Nigeria-A-Review.pdf>.
- Danja, Isa Ibrahim, Xue Li, and S. G. Dalibi. 2017. 'Vernacular Architecture of Northern Nigeria in the Light of Sustainability'. In *IOP*

- Conference Series: Earth and Environmental Science*, 63:1219–26. IOP.
<https://doi.org/10.1088/1755-1315/63/1/012034>.
- Dmochowski, Zbigniew. 1990. *An Introduction to Nigerian Traditional Architecture*. Vol. 2, So. London: Ethnographica in association with the National Commission for Museums and Monuments.
- Munoz, Louis J. 2003. *A Living Tradition: Students in Yoruba Civilization*. Nigeria: Bookcraft, Nigeria.
- Noma, Tanimu Adamu Jatau, Ali F. Bakr, and Zeyad M. El Sayad. 2022. 'Integration of Hausa Traditional Architecture in the Development of Abuja: A Methodological Approach'. *International Journal of African Society, Cultures and Traditions* 10 (1): 27–38.
<https://doi.org/10.37745/ijasct.2014/vol10no1pp.27-38>.
- Olotuah, Abiodun Olukayode, and Damilola Esther Olotuah. 2016. 'Space and Cultural Development in Hausa Traditional Housing'. *International Journal of Engineering Sciences & Research Technology* 5 (9): 654–59.
<https://doi.org/10.5281/zenodo.2297740>.
- Umar, G. K. 2017. 'Transformation in Hausa Traditional Residential Architecture'. *International Journal of Innovative Environmental Studies Research* 5 (4): 5–11.
<http://www.seahipaj.org>.
- Umar, Gali Kabir, Danjuma Abdu Yusuf, Abubakar Ahmed, and Abdullahi M. Usman. 2019. 'The Practice of Hausa Traditional Architecture: Towards Conservation and Restoration of Spatial Morphology and Techniques'. *Scientific African* 5 (September): e00142.
<https://doi.org/10.1016/j.sciaf.2019.e00142>.
- Zhang, J., and Z. L. Yusuf. 2018. 'A Study on the Building Materials and Construction Technology of Traditional Hausa Architecture in Nigeria'. In *Proceedings of the International Workshop on Materials, Chemistry and Engineering (IWMCE 2018)*, 434–41. Science and Technology Publications, Lda.
<https://docplayer.net/220059371-A-study-on-the-building-materials-and-construction-technology-of-traditional-hausa-architecture-in-nigeria.html>.