

**T.C.
BAHCESEHIR UNIVERSITY
GRADUATE SCHOOL OF EDUCATION
THE DEPARTMENT OF ARCHITECTURE**

A. AHMAD

**A STUDY ON THE TRANSFORMATION OF
VERNACULAR ARCHITECTURE OF NORTHERN NIGERIA
THROUGH OLD AND NEW PALACES**

**MASTER'S THESIS
AMINA AHMAD**

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ISTANBUL 2023

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ABSTRACT

A STUDY ON THE TRANSFORMATION OF VERNACULAR ARCHITECTURE OF NORTHERN NIGERIA THROUGH OLD AND NEW PALACES

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Architecture Masters Program

Thesis Advisor: Assoc. Prof. Dr. Efsun Ekenyazıcı Güney

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In the history of the Hausa region in northern Nigeria, palaces have been showcases of power, tradition, and culture. These palaces have been of great importance since the 15th century as administrative centers over cities. Their architectural approach was important to reflect the culture, power, and history of the Hausa people. These palaces also represented the features that makeup Northern Nigerian Native Architecture VANN. Unfortunately, the influence of VANN, which constitutes the transmission chain of architectural traditions, in the design of palaces began to disappear in the 19th century. Today it is difficult to associate these palaces with the features of VANN.

This research aims to show the transformation of VANN's influence on palace design and also to present a list of recommendations for designers of new Hausa palaces. Underlining the change in the architectural design and construction approaches of the palace, the study also emphasizes the importance of preserving the architectural heritage and identity of the palaces. For this, four palaces were chosen, which are representatives of the old and new palaces in Hausaland. Two of these are historic palaces with traditional design features that follow VANN. The other two are newly built palaces that contrast with the architecture of historical examples. Within the

scope of the study, visual evaluation and documentation were made in each palace, and historians who were experts in the history of the palaces were interviewed. The studies show that the production of new building materials, the lack of skilled labor and the problems in the preservation of the architectural heritage, and the production with new construction techniques and architectural understanding are fast and preferable. However, in some palaces, it is seen that architectural features are tried to be preserved by using the reflections of VANN. As a result of this study, a list of suggestions is presented in order for the designers to act with an architectural understanding bearing the traces of vernacular architecture, while designing new palaces in the Hausa region, without compromising the historical and cultural values of the region.

Keywords: Vernacular Architecture, Architectural Heritage, Architectural Identity, Northern Nigeria, Palaces.

ÖZ

KUZEY NİJERYA VERNAKÜLER MİMARİSİNDEKİ DEĞİŞİMİ ESKİ VE YENİ SARAYLAR ÜZERİNDEN İNCELEYEN BİR ARAŞTIRMA

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Kuzey Nijerya'da bulunan Hausa bölgesinin tarihinde saraylar gücün, geleneklerin ve kültürün vitrinleri olmuştur. Bu saraylar, şehirler üzerindeki idari merkezler olarak 15. yüzyıldan beri büyük öneme sahip olmuştur. Mimari yaklaşımları, Hausa halkının kültürünü, gücünü ve tarihini yansıtmak adına önemli idi. Bu saraylar aynı zamanda Kuzey Nijerya Yerel Mimarisi VANN'ı oluşturan özellikleri de temsil ediyordu. Ne yazık ki mimari geleneklerin aktarım zincirini oluşturan VANN'ın sarayların tasarımındaki etkisi 19. yüzyılda kaybolmaya başlamıştır. Günümüzde bu sarayları VANN'ın özellikleriyle ilişkilendirmek zordur.

Bu araştırma, VANN'ın saray tasarımı üzerindeki etkisinin dönüşümünü göstermeyi ve aynı zamanda yeni Hausa saraylarının tasarımcıları için bir öneriler listesi sunmayı amaçlamaktadır. Sarayın mimari tasarım ve inşaat yaklaşımlarının değişiminin altını da çizen çalışma ayrıca sarayların mimari mirasının ve kimliğinin korunmasının önemine de vurgu yapmaktadır. Bunun için Hausaland'daki eski ve yeni sarayların temsilcileri olan dört saray seçilmiştir. Bunlardan ikisi, VANN'ı takip eden geleneksel tasarım özelliklerine sahip tarihi saraylardır. Diğer ikisi, tarihi örneklerin mimarisiyle tezat oluşturan yeni inşa edilmiş saraylardır. Çalışma kapsamında her sarayda görsel değerlendirme ve belgeleme yapılmış, sarayların

geçmiři konusunda uzman olan tarihçilerle görüřülmüřtür. Yapılan çalıřmalar yeni yapı malzemelerinin üretilmesinin, vasıflı iřgücünün eksikliđinin ve temel olarak mimari mirasın korunması konusundaki problemlerin ve yeni yapıım teknikleri ve mimarlık anlayıřı ile üretimin hızlı ve tercih edilir olduđunu göstermektedir. Yine de bazı saraylarda VANN'ın yansımalarını kullanarak mimari özelliklerin korunulmaya çalıřıldıđı görülmektedir. Bu çalıřmanın sonucunda, tasarımcıların Hausa bölgesinde yeni saraylar tasarlanırken bölgenin tarihi ve kültürel deđerlerinden ödün vermeden, vernaküler mimarlıđın izlerini taşıyan bir mimari anlayıřla hareket edebilmeleri adına bir öneriler listesi sunulmaktadır.

Anahtar Kelimeler: Yerel Mimari, Mimari Miras, Mimari Kimlik, Kuzey Nijerya, Saraylar.



To My Family

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LIST OF ABBREVIATIONS

DC	Development Control
ICCROM	International Centre for the Study of the Preservation and Restoration of Cultural Property
ICOMOS	International Council on Monuments and Sites
NAC	National Antiquities Commission
NCMM	National Commission for Museums and Monuments
UNESCO	United Nations Educational, Scientific and Cultural Organization
VANN	Vernacular Architecture of Northern Nigeria

Chapter 1

Introduction

The basis of every community is in its identity, which can be seen in diverse ways. In the way they dress, behave, and how they live. Living spaces have long been known to be expressions of the culture and identity of a people. The same goes for the Hausa people from northern Nigeria- an early community that dates to between 100 and 1200 AD and is one of the country's most dominant ethnic groups. The northern region of the country is largely covered by Hausa land, also known as *Kasar Hausa* (Uthman Hannafi Bamalli, 2018). The conservative nature of these people is a lot derived from the Islamic religion in which most of them are worshippers. Islam came into Hausa land first around the 15th century to replace *Maguzanci*, a type of African traditional religion and is the most practiced religion by the Hausa. Despite not being indigenous to Hausa land, Islam is now recognized as the most distinguishing aspect of Hausa culture, along with the Hausa language (Ademola Adeleke, 2005). These communities of Hausa people lived in traditional settlements built for necessity purposes made with local construction methods and materials. They, like any other early communities, have developed their kind of vernacular architecture from a nomadic lifestyle to suit their environmental conditions, social, religious, and dwelling needs. Hausa people originally lived only in simple round mud huts with thatched roofs. Their vernacular architecture then developed through the 15th century to include the influences of Islam and travelers coming from the northern part of Africa (Hammad Tukur Saad, 1981). The spatial hierarchy, surface treatments, façade organizations, and building forms have been developed to satisfy the region's religious and social needs.

Architecture without architects or vernacular architecture is being used as a reference that gives clues about the regions' architectural language, architectural practice, construction techniques, materials, etc. by different societies (Amos Rapoport, 1969). It is a reference to the past, sometimes still a way of design. Today the use of vernacular architecture or the interpretation of vernacular architecture opens design possibilities and/or restrictions. For instance, Masdar City, situated near Abu Dhabi, prides itself on being one of the world's most sustainable cities. To

meet sustainability requirements, architects and designers drew influence from Arabic vernacular architecture. They achieved this by adapting design elements, including the inward planning system, the use of local resources for building materials, and others, such as high ceilings, thick walls, and narrow pathways. (Maha Salman, 2018). According to Salman (2018), these elements need to be combined with modern technology to produce a design that satisfies sustainability and identity requirements.

The vernacular architecture of northern Nigeria has been a very specific architectural language that is easily possible to differentiate from the architectural language of other parts of Nigeria due to its uniqueness. There is even a specific name that is being used; Vernacular Architecture of Northern Nigeria (VANN). This is an umbrella term being used in the references for this region's vernacular architecture. It was originally used in 2017 by Isa Ibrahim Danja, Xue Li, and Dalibi in the study they conducted that reviewed the concepts and features of VANN in an effort to identify the factors that hinder the use of the said architecture. It highlights that the intricate ornamentation and the types of building materials—earth, wood, grass, and stones—are the primary characteristics of VANN. It proceeds to enumerate the natural, social, and economic factors that hinder implementation.

As underlined by Noah Ephraim Arome and Çiğdem Çağnan (2021) architects have recently started to use VANN as an inspiration as historical precedents while they design. As a result, designers and academics are trying to initiate contributions to the resurgence and incorporation of Hausa traditional architecture (Ogechukwu Elizabeth Okpalanozie & Olufemi Samson Adetunji, 2021). A comprehensive investigation of the architecture is required for it to be used as inspiration in the 21st century, according to Uthman Hannafi Bamalli's (2018) research on the resuscitation and rebirth of Hausaland architecture. Additionally, he provided recommendations for how this could be accomplished by combining contemporary building materials with the original construction methods developed by creative builders in the past. He added that these are just a few approaches to give the architecture its' just due. In a research by Moukhtar Mai and Sani Khalil (2019), they assert that understanding the various circumstances that led to the emergence of these regional identities, is at the heart of this issue. They claimed that employing

vernacular architecture today would positively enhance the expression of architectural identity because it would incorporate architectural strategies like understanding the concepts of form, space, order, and genius loci.

A typical Hausa city comprises significant modules of residential, religious, commercial, and institutional buildings. A great majority of the buildings with the same functions mostly share lots of similarities in terms of their materials, forms, dimensions, color, architectural language, etc. On the other hand, buildings even with different functions have similar characteristics according to VANN. For example, the residential units where city dwellers live, religious structures as the places of worship and religious educational facilities, the market which is fundamental to the commerce district's other economic institutions, and other institutional buildings that serves the healthcare, education, recreation, and government facilities. Among all these buildings, the palaces of Emirates located at the center of the city are the most significant governmental buildings. According to Moses Ochuonu (2008), the Hausa emirates of Northern Nigeria served as the most important legislative centers from the 15th century and hold an extent of significance in the present-day states in which they reside. Since they are edificial landmarks, these structures in their essence must portray regalia, cultural significance, and the power of these palaces. Therefore, the palaces are chosen for this research as they are encompassing examples of the VANN, in spatial arrangement, detailing, and structure. Palaces are chosen because they are the only building type that may still have VANN features intact, other building types have long evolved and show little or no connection with VANN. The majority of the other architectural typologies were created from them since they served as symbols and served as focal points of Hausa communities (Isaac Samuel, 2022). To show their sense of identity and culture, the people would imitate the palace designs in their homes. The typical Hausa vernacular building, including Hausa palaces, would be sustainable in the minimal use of available materials, cultural appreciation, and functionality (Danja, Li, & Dalibi, 2017).

But since the beginning of the 19th century, new palaces are being constructed in the Hausaland, and when these palaces are compared with the old palaces of the Hausa people, an important transformation and change in their architecture is noticed. The historic palaces used to be double-volume, single-floor structures made

using locally available materials and built over many years using construction methods that had been honed locally. Contrary to the old palaces, the new ones seem to be bigger, and higher, they have more than one floor, the construction techniques, materials are different, and even the façade language of the new ones is different from the vernacular examples. Therefore, it is not possible to connect these new palace buildings with historic and traditional examples. It is realized that, owing to current trends of the contemporary world, the architecture of these new palace buildings is being gradually replaced.

Another important point is that the old palaces are in danger to be demolished. The preservation approach of the region on these building types –and also others should be considered. When research about the palaces and the preservation of VANN is analyzed, recent research has shown only a couple of these palaces have been preserved, some reconstructed, while others have been demolished. According to a data collection study by Salim Bashir Umar (2018), some palaces in Northern Nigeria are currently in various stages of change and conservation. Today, in the construction of new palaces and the restoration of old ones contemporary building techniques and materials are preferred, and the spatial organization of the buildings is also transformed. The study shows that the palaces in Katsina, Daura, Hadejia, Zazzau, and Bauchi are better preserved with minimal touches with the help of restoration and renovation, the palace in Kano is partially conserved and partially renovated, and the palaces in Gombe and Sokoto have lost their historical significance as they were completely demolished. Even after being restored, like in the case of Gombe Palace, the new structure had characteristics that were different from those of VANN in terms of building materials and techniques, increase in height and the number of floors, the façade language, and other features. The lack of conservation of the buildings is due to a variety of factors, including the absence of a conservation manual that gives information about the structural issues, building materials, planning, rendering, etc...Danja, Li, and Dalibi (2017) also underlined important factors; the impact of human negligence, a lack of experienced laborers, adverse weather, and the high cost of maintaining building materials, which forced people to choose a more durable material like concrete. Therefore, it is

possible to claim that proper documentation is needed in order to make appropriate preservation of old palaces and reproduction of new palaces.

Hence, this research aims to analyze the effect of vernacular architecture on the architecture of Hausa palaces and how this vernacular architecture is being affected over time. This research would like to create a list of recommendations about vernacular design for architects, designers, and authorities about how VANN would show the way to design a new palace or renovate the old ones or make a connection between history & contemporary architecture. This study aims to help the people working on the preservation and restoration of the architecture of the palaces. It might help new designs to give references to VANN. The objectives of the research will be:

1. To understand the origins of vernacular architecture in Nigeria,
2. To relate the Vernacular Architecture of Northern Nigeria (VANN) with the design of the palaces,
3. To assess the problems associated with the preservation of the earlier palaces,
4. To understand the transformation of the palaces,
5. To develop a list of design recommendations for the design of future palaces in the Hausa Kingdom.

1.1 Research Questions

1. What are the effects of vernacular architecture of Nigeria on the design of the palaces?
2. What are the important issues that the designers should be careful about when there is a need to make some changes to the palaces without harming their cultural significance and identity?
3. What are the possibilities to incorporate VANN into the design and construction of future palaces?
4. What are the problems and possible solutions for the preservation of the old palaces as the showcases of VANN, architectural heritage, and reflections of the identity of the region?

1.2 Research Statement

The rulers of northern Nigeria exercised absolute power prior to colonialism, and under British rule, they were integrated into the colonial government. They became more powerful as a result. Emirates today have a division under the state government and functions as stabilizing institutions in all kingdoms, big and small, across the nation. They act as mediators in disputes and oversee the Shariah court. These institutions had palaces as their administrative and official headquarters. These structures were constructed to demonstrate the level of power they embodied, having them made with scrutinized details and by the best foremen. They became significant as a higher authority and for cultural representation; its architecture was the first of its kind, and other typologies have since emulated it (Samuel, 2022). Although these structures were created in the past, they must be preserved as long as these emirates are in existence. Preservation of the palace architecture is also necessary in cases where places have to be rebuilt if the need arises due to demolition/decay, the need for expansion, or when new emirates are formed. Unfortunately, there is little knowledge and information on how to reproduce the designs of Hausa palaces, which are significant cultural landmarks, and preservation of the previous ones that ought to endure the effects of aging and urbanization.

These buildings which have been designed and constructed between the 15th and 19th centuries according to VANN have been an integral part of promoting the identities of the Hausa people. Even so, they have faced some preservation problems. Some of these palaces have lost their architectural identities due to the transformations they faced in time. Also, some of them are demolished. But, since new palaces are still in demand, their architectural language and design approaches should be analyzed. It is important to underline how VANN has been used in these buildings and how this architectural system might be a part of the design of these buildings in order to continue the architectural identity of the palaces.

1.3 Scope of Study

This thesis seeks to study the vernacular architecture of Hausa Palaces in Northern Nigeria. The research aims to show the change in the architecture of these palaces over the years and it also aims to make a list of recommendations for the design of the palaces to be restored or the design of the new palaces. Thus both historic (old) and contemporary (newly built) palaces will be taken into consideration.

1.4 Methodology

The thesis's first chapter provides a contextual overview and introduction to the importance of palaces and vernacular architecture in general. In the second chapter, pertinent literature on architectural heritage conservation is discussed where the relationship of vernacular architecture as heritage is outlined. The third chapter which is the second part of the literature review discusses more specifically the important features of the vernacular architecture of northern Nigeria and the significance of palaces to VANN. The preservation problems faced with the vernacular architecture of the Hausa palaces are covered in this chapter.

This research focuses on a qualitative approach which is best for analyzing non-numerical data (Pritha Bhandari, 2020). The research is two-folded in the sense that it includes two research methods; case studies of selected palace examples and also semi-structured interviews (Figure 1). The selection criteria of the cases is related with the fact that these palaces provided sufficient information about their history and characteristics. Historic examples are also among the ones which reflect the features of VANN in a detailed way. Newly constructed examples are selected due to their architectural features which represent the variety of the universe of newly constructed palaces in northern Nigeria. The selected cases will be reviewed in two ways; through a comparative analysis which looks at the similarities and differences between the cases and a visual assessment through field surveys by the author. The case studies' primary data will be sourced by the author. The semi-structured interview will have a set of open-ended questions whose order will be determined by the previous answer of the participant (Bhandari, 2020). The

participants will be selected from the occupants, builders, and historians, through purposive sampling to select the best for the research. According to Bhandari (2020), purposive sampling is that which is not based on probability but based on sampling techniques needed in the research. The participants will be selected from a sample of historians who have vast knowledge about the building of the palaces. One interviewee is chosen per palace as each palace has one of such historian.

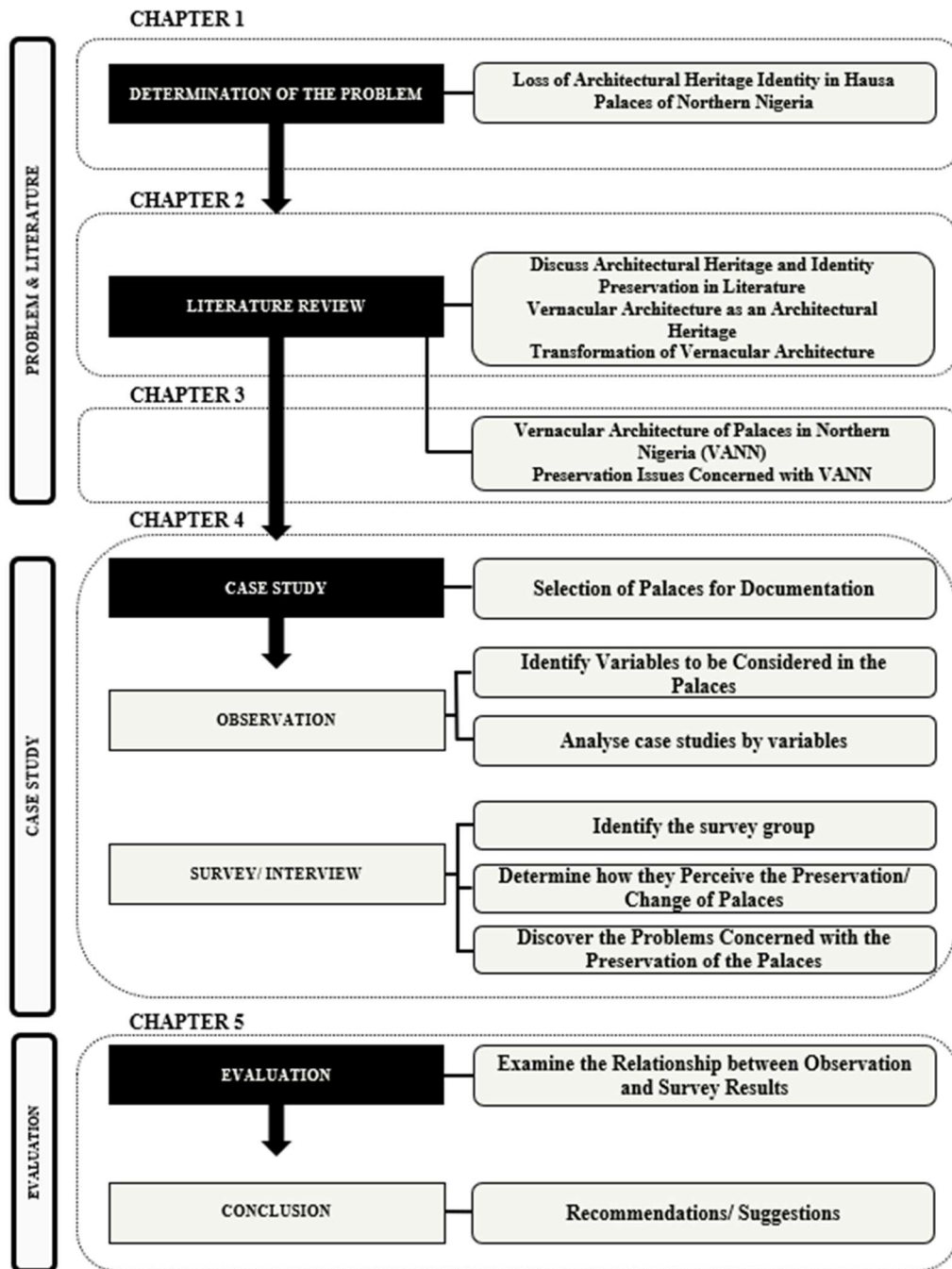


Figure 1. Methodology of the research.

The data collected will also be analyzed in the fourth chapter, where the research's findings and a discussion to determine the relationship between observations and results will be presented. Chapter five will contain architectural suggestions for the potential new palaces in Northern Nigeria which provide suggestions for further research. Here, a list that includes architectural & decorative suggestions is prepared in order for the designers to act with an architectural understanding bearing the traces of vernacular architecture, while designing new palaces in the Hausa region. Finally, an overall evaluation will be employed as concluding remarks.



Chapter 2

Defining Vernacular Architecture

Vernacular architecture is defined linguistically by Paul Oliver (2006) as "the architectural language of the people." This refers to structures created by tribal communities without the use of an architect or other specialized designer. A vernacular structure is one that was constructed using common knowledge and problem-solving techniques with materials that are locally found and suitable for the climate (Rapoport, 1969). According to Anna Martynenko (2017), vernacular architecture entails important information about the fundamentals of architectural form, building typology, and construction techniques. It is recognized as an architectural strategy that is considerate of folk, climate, environment, and cultural and religious traditions. The understanding required to address the problems with current architecture can be gained through studying vernacular architecture (Oliver, 2006). Camilla Ghisleni (2020) asserts that this architecture is directly tied to its surroundings, cognizant of the unique geographic characteristics and cultural facets of a location, and significantly impacted by them. It is specific to many locations across the world and serves as a way of confirming identity. It also serves to symbolize the cultural identity of particular groups and serves as a tool for building a sense of belonging among the population and its region. Despite the difference in location, vernacular architecture has common characteristics of Regional construction usually built by the community or owners to meet specific social cultural, and economic needs (Oliver, 2006).

One of the most important factors that have shaped vernacular architecture in many regions is climate. As in earlier times, the technology was not so advanced yet they came up with ways of achieving passive climate design. Since ancient times, it has been understood that climate design is based on the specifics of the local environment. Evidence is in the *Mesa Verde* or 'green table' dwellings of the ancient Pueblo people of North America in the 1190s where they utilized solar energy by the shape of the structure (Figure 2). The structure made by carving sandstone with hardstone provided shading during the summer and was oriented to face the south and improve heat gain during the summer. The stones are held together using a

mixture of soil, ash, and water (Varun Kumar, 2015). According to Kumar (2015), this dwelling is seen as one of the finest examples of solar heat protection.



Figure 2. Mesa Verde dwellings, south façade
(Kumar, 2015).

Another significant example of vernacular architecture where climate played a huge shaping role is the igloo structure in the extreme winter conditions of the Esquimaux. These igloos originated from the Quinzhee, which were temporary loose snow shelters. The igloos are dome-shaped homes created by stacking hard snow blocks in a circular arrangement, which offers insulation and produces an indoor temperature that averages 32 degrees Celsius (Figure 3). The entrance that leads into the Dome keeps the heat within the igloo, and an opening is cut out at the top to let warm air out preventing the ice from melting (Tirthika Shah, 2013).



Figure 3. The Igloos in the Esquimaux
(Shah, 2013).

Other than climate, other factors that have influenced the development of vernacular architecture are culture, respect for nature, and available materials and in most cases, all these factors are seen. The respect for nature displayed in Ancient Egyptian buildings is an example of vernacular architecture through utilizing locally sourced materials. The culture of the people is mostly reflected in this design's elements (Figure 4 & 5). The requirement for privacy influences the buildings' introverted architecture, which includes features like courtyards, curved entrances, and lattice screens. In this warm region, the courtyard and lattice screens also provided cooling. Staggered streetways are used in Egyptian city design to help cool wind circulate through the towns. Utilizing locally sourced materials also prevented waste (Hanan, S. Saleh & Salah, Z. Saied, 2017).



Figure 4 & Figure 5. Egyptian house showing lattice screen and courtyard
(Saleh & Saied, 2017).

Additionally, vernacular architecture is frequently mentioned in relation to sustainability. When one looks back in time, one notices that the architecture was neither wasteful of resources nor destructive to the environment when it came to building materials. They were able to create excellent sustainable architecture with little technological advances, even if this was primarily owing to constraints. Modam Shahid (2013) says that this is proven in ancient Roman architecture in the design of buildings and cities in a number of ways. The cities were sustainable through the use of renewable energy for the design of aqueducts that supplies water to the city (Figure 6) (Shahid, 2013). According to Kumar (2015), the collection of rainwater also demonstrates how they reused water to cool houses in the summer through wind towers. Optimum orientation of their buildings provided for passive lighting of spaces for different functions throughout the day (Shahid, 2013). Shahid (2013) says the Romans used geothermal energy to warm the public baths and keep their dwellings warm during the winter.



Figure 6. A Roman aqueduct
(Kumar, 2015).

In conclusion, vernacular architecture is that which takes into consideration the environment, climate, and culture. It is appreciated nowadays and is referenced for its environmental, economic, and culturally sustainable features. But with time, it has faced a transformation due to the advent of globalization and industrialization. This transformation is analyzed in the next section of this chapter.

2.1 Transformation of Vernacular Architecture

Transformation is one of life's unavoidable realities, and with time, it has had its impact on vernacular architecture. It is a natural phenomenon that results from a plethora of factors that vary based on the case, the location, and the demands of a population. Saskia Vogelsang (2019) says transformation could be due to a number of outward and inward reasons including weather, culture, and ethnicity. In architecture, transformation occurs at several stages from design to completion. In many instances, this transformation was sparked by the new structures that colonizers of an area built. For example, the European Dutch built structures in Indonesia which later fused with vernacular architecture to form a new kind of architecture (Vogelsang, 2019). Venkata Krishna Kumar Sadhu and Ramesh Srikonda (2020) cited a lack of skilled labor, income restrictions, maintenance costs, a lack of interest, and the accessibility of building materials as reasons for the transformation of architecture in India. Government policies that promote

afforestation lead to a decline in the availability of wood which is a staple building material in Indian architecture (Sadhu & Srikonda, 2020).

Technology, as we all know has had an immense effect and the transformation of vernacular architecture. Through globalization and industrialization, changes have come about in various sectors and industries including the building industry. It is seen from research how much change has been brought about by the advent of technology. According to Sadhu and Srikonda (2020), the continuous efforts of man to achieve more comfort and convenience have brought about technological advances in the field of architecture and building. These technological transformations are seen in various aspects like the availability of building materials, ease of building, and transportation of materials. Building materials have now become cheaper, more available due to transportation, and more durable. Jerroy Nya Gbatu and Haiying Li (2019) Confirm in their research and burnt the transformation brought about by technological advancement has brought about an improved lifestyle and with contemporary building materials and techniques, buildings are it will also be done faster and more efficiently, even though they further talk about the adverse effect of these technologies.

Vernacular architecture, the lives of people, and the environment as a whole are undoubtedly being impacted by this transformation. These outcomes are both admired and condemned. Gbatu and Li (2019) stated that the transformation of architecture in Liberia has brought about technology to building methods and construction techniques. They added that modernism and transformation are not mutually exclusive concepts. It has made it possible to comprehend a variety of construction materials and techniques (Vogelsang, 2019). On the contrary, it is seen as a vehicle that leads to the loss and disappearance of identity. Garcia A. Hermida (2020) claims that abstracted and altered building components have taken the place of the unique features of regional architecture, another term for vernacular architecture. She argues that even heritage-protected vernacular buildings fall into ruin owing to a lack of maintenance because building regulations do not provide solutions for all of the problems. She adds that if the listed buildings are compared to those that have been damaged, it can be concluded that listing enough will not solve the problem. An effect it has on the environment as stated by Gbatu and Li (2019) is

the adoption of environmentally hazardous, non-sustainable technology. They argued that well-suited technologies have been abandoned to be replaced with those that produce large volumes of CO₂ emissions and are exhausted at dangerous rates.

Probable solutions to the negative effects of transformation on vernacular architecture have been given by Hermida (2020) and Gbatu and Li (2019) in their research. One is the use of vernacular ways and materials that do little to no harm to the environment (Gbatu & Li, 2019). Other methods include educating building professionals, promoting regional crafts, and producing a visual manual for use in planning, modifying, constructing, repairing, and commissioning vernacular structures.

2.2 Preservation of Vernacular Architecture as Architectural Heritage and Identity

Cambridge Dictionary (1995), defines heritage as characteristics of a society's culture that were developed in the past but still have historical significance, such as customs, languages, or architecture. Cultural heritage has been classified by The United Nations Educational, Scientific, and Cultural Organization (UNESCO), based on its physical or non-physical forms into tangible and intangible heritage. Man's physically intricate works of art and architecture, books, works of literature, defense systems, textiles, pottery, and other objects are regarded as tangible cultural heritages. Non-physical cultural heritage, as opposed to physical cultural heritage, encompasses all intangible and invisible facets of a people's way of life, including concepts, folklore, kinship, norms, values, worldviews, philosophies of life, religious beliefs and practices, music, dance, festivals, traditions, language, and knowledge, among others (Blessing Nonye Onyima, 2016). These offer an even more thorough justification of the function that cultural heritages serve as the identity of a society. It has been discovered that the preservation and upkeep of historical monuments have resulted in the development of a sturdy cultural identity by withstanding urbanization movements. As a result, while the physical environment -such as a person's home or workplace- may serve as a representation of culture and social norms, it can also serve as a repository for aspects of one's own identity. Furthermore, the location is

more than just an abstract idea; it consists of several components that work together to define the environment's personality, or what is known as a place's nature. Since historical monuments were created through a shared experience, with which we can express our collective identity. In other words, historical landmarks serve as an expression of shared memories and experiences (Mohammad Sadegh Taher Tolou Del, Bahram Saleh Sedghpour, & Sina Kamali Tabrizi, 2020).

Taher Tolou Del, Sedghpour, and Tabrizi (2020) specified three primary permanent attributes comprising architectural heritage; sites - a combination of natural and manmade work of conspicuous interest, monuments - buildings and structures that constitute scientific and archaeological significance and groups of buildings of urban or rural settlement which may be of historic precedent. Appreciation of architectural heritage is done worldwide by people through conservation. Conservation of architectural identity is important as it is a way of preserving the identity of these structures. Shannon Ricketts (1996) and Lydia Muthuma (2016) have in similar studies in California and Nairobi respectively discussed the relationship between the conservation of architectural heritage and identity. They demonstrated how the conservation of buildings affected the collective memory of the people, which helped to rekindle their sense of community and national identity. In other ways, conservation has been proven to create a sense of appreciation of culture and other cultural values. Studies have also shown that there is a level of economic advantage to monument preservation (Randall Mason, David Myers, & Marta De la Torre, 2005)

Conservation of architectural identity goes way beyond the physical preservation of buildings, it involves also the preservation of the spirituality that comes with these buildings. According to Anna Karlström (2013), conserving a building's spiritual, social, and theoretical values today is as crucial as preserving the building's initial form. This is further supported by Phil Hubbard and Keith Lilley (2000) in their research where they showed that maintaining the intangible principles and everlasting existence of life in buildings should be included in the physical conservation of buildings. Studies have shown the importance of the conservation of architectural heritage on the culture, economy, education, and spirituality of a place, but the effect on the people living in the surroundings of these monuments is also

taken into account. A study in Portugal claims that attributes of a monument's place such as buildings, terrain, pathways, stories, documentation, events, textures, colors, and smell can enhance the way of life of people and improves their sense of identity (Miguel Malheiro, 2017).

Despite a lot of studies and knowledge of architectural heritage conservation, what then hinders its implementation? Isnen Fitri and Yahaya Ahmad (2017) provided evidence that the preservation of historical structures in Indonesia has not advanced due to the absence of clear, comprehensive guidelines for their preservation. They further added that the tourism sector has not grown to its full potential due to the unwillingness of the government to allow private sector participation in the preservation of historic sites. A study by Samson Olufemi Adetunji (2022) in Badagry town in Nigeria identified the causes of the nonpreservation of heritage sites, one being the cultural belief that made people let structures decay being whatever is made from the earth is meant to eventually return to it. The author also found modernization and change of materials that were done to solve weathering issues as other factors. Another study by Afolasade Adewumi (2022) describes the gap in the knowledge of cultural past and architectural identity to be caused by both natural and manmade influences. Some of these causes were modernization, unregulated tourism, economic pressure, flaws in conservation policies, and climate change. Onyima (2016) also stated the challenges faced in Nigerian heritage conservation, some of which were inexperience, globalization, vandalism, and social change. Nigerian architectural conservation is crippled by factors of decay of the buildings due to the temporary nature of materials used, lack of understanding of the importance of the process, and crises that have risen over the years (Adewumi, 2022). Onyima (2016) claims that despite the existence of a heritage preservation organization, their efforts are hampered by low subsidies and a lack of encouragement from the government.

It is understood from the literature review that government and non-governmental organizations have come up with creative ways of upholding the conservation of architectural heritage. Through creating and designing guidelines, they have helped to create awareness, promote social sustainability, and aid in the preservation of architectural heritage. These guides should be taken and utilized as

valuables by society. As Tracy Ireland, (2002) stated that these values were developed in Australia both locally and internationally. Locally, to prevent the effects of modernization, and internationally due to efforts of organizations of architectural heritage protection such as UNESCO. The world heritage list covers internationally legally protected landmarks by UNESCO which are heritages with architectural, cultural, scientific, and historical significance to the world. Local efforts also such as the participation of all members of communities and stakeholders are vital for the success of values-based architectural heritage management (Kristal Buckley & Shanon Sullivan, 2014).

When the issue is analyzed from the perspective of Nigeria, (here maybe you can say that “some differences/similarities are realized) it is realized that the Federal Republic of Nigeria's 1990 NCMM Act, Cap. 242 statute placed the National Commission for Museums and Monuments (NCMM) to oversee the collecting, recording, preservation, and public display of the national cultural heritage for the benefit of education, enlightenment, and entertainment. From the date of its existence till date, it now monitors 52 museums and 65 monuments including architectural sites across the country.

As was already mentioned, vernacular architecture serves as a symbol of a group's cultural identity and has evolved into a means of fostering ties between individuals and their place in the world. To recognize tangible aspects of our architectural past and to obtain a comprehensive picture of who we are as a community, architectural identity is crucial. Anuhya Mandava (2023) suggests that we can learn about the traditions, values, and culture of past generations by studying vernacular architecture. It explains the context of the creation of these structures. We may also discover our identity and sense of place in the world through this study, which helps us comprehend how our architecture has changed over time. Preservation is essential to maintaining this identity in our buildings because it enables us to reflect on the significant cultural and historical occurrences that influenced the creation of these structures.

Owing to its architectural value, vernacular architecture should be considered the foundation and source of the architectural heritage of every nation. According to Rapoport (1969), vernacular architecture is a significant part of architectural history that shows the depth of the world's cultural diversity. On the other hand, Taher Tolou Del, Sedghpour and Tabrizi (2020) define vernacular architecture as the primary source and they say that it also encompasses all three attributes of architectural heritage, i.e. monuments, groups of buildings, and sites. Vernacular architecture is appreciated as it solved a lot of environmental, climatic, and cultural needs with little technological advances at that time. It is an indigenous art that achieved more with less and aided the use of readily available materials (Danja, Li, & Dalibi, 2017). In addition to its visual quality, it offers distinct and incomparable examples of cultural significance. Since this architecture has become vulnerable to the effects of globalization and change, it is more reason to keep its heritage well taken care of and promote its preservation. The age of the structure/building, initial building materials, and construction techniques used should be taken into substantial consideration to preserve the built heritage (Danja, Li, & Dalibi, 2017).

If the approaches toward preservation are investigated, some examples are seen throughout the world where some approaches to preservation are done. The preservation carried out by the dwellers of the communities themselves like in the case of the “Daia Project of the Monumentum Association” and “The Lasting Village” projects in villages of Romania that seek to restore the indigenous architectural cultural heritage: buildings, facades, scenery, and craftsmanship practiced by the towns between the 18th and 19th centuries. This collaboration between the community and local government was important. They selected some areas to be restored which are private or governmental areas. This also created entrepreneurial opportunities for the people. The cost of the restoration is covered by the association and the community helps by feeding the workers (Elena Manuela Iștloc & Ionel Iștloc, 2021).

Another example of preservation and protection done by UNESCO through the world heritage list is the Sukur Cultural Landscape in Madagali Local Government Area of Adamawa State in Nigeria (Figure 7).



Figure 7. Sukur cultural landscape.
(UNESCO).

This settlement has survived unchanged for several years when other similar kinds have faced changes all over the world. The site is one of the monuments of the NCMM that was inaugurated into the list by efforts of the state government and the written consent of the Hidi-in-council (head) of Sukur. Subsequently, it has been maintained by the state tourism division and the NCMM through the use of traditional materials in annual restoration works. It is popular for its terraced hilltop dry stone structures, stone pathways, and sunken farmlands.

The Nara document on authenticity is noteworthy for its contribution to the preservation and protection of cultural heritage. ICOMOS brought forward the idea at the World Heritage Committee's 16th meeting. Following the World Heritage Convention, the International Council on Monuments and Sites (ICOMOS), the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), and the United Nations Educational, Scientific, and Cultural Organization (UNESCO) collaborated to create the 1994 Nara document at the Nara conference in Japan (ICOMOS, 2012). The document expands on the Venice chapter which highlighted cultural heritage problems. The necessity for a deeper comprehension of diversity in culture and history in relation to conservation is

addressed. Respect for other cultures and their tangible and intangible expressions, which are all part of each culture's heritage, are emphasized. It does not use predetermined standards to determine the authenticity of cultural property; rather, it assesses it in the context of the culture to which it belongs (Herb Stovel, 2008).

The Nara document is founded on core principles that aid in comprehending and evaluating the authenticity of cultural heritage. These principles include the value or significance attached to the heritage; authenticity as a process that is constantly evolving; tangible and intangible aspects of the heritage; and the significance of respecting and preserving the heritage's diversity (Stovel, 2008). The document is important for cultural heritage preservation since it offers a general framework and guidelines for experts and stakeholders working in the field. It provides guidelines for conservation techniques that place a priority on the preservation of authenticity, integrity, and cultural distinctiveness. It also encourages global cooperation, community involvement, and public awareness (ICOMOS, 2012). The UNESCO World Heritage Committee division examines and employs the document in the protection of the locations on its World Heritage List (UNESCO).

Authenticity, according to the Nara document, is something that cannot be measured and is determined by cultural context. This concept was used in determining the authenticity of the most significant Japanese Shinto shrine, the Ise Shrine after a misconception (Figure 8). Since the shrine is completely entirely rebuilt every twenty years, it was misconceived that the Japanese conservation methods were not giving importance to material authenticity. Later it was revealed that the materials were reused in the rebuilding to the greatest extent possible, making Japanese architectural heritage fulfill the authenticity criteria.



Figure 8. Ise Shrine, Japan
(Stovel, 2008).

Although more work needs to be done in this area, it is clear from an analysis of the preservation of architectural heritage that has been carried out globally through both local and international efforts that progress has been made. In most places, the factors that have hindered the preservation of vernacular architecture heritage range from lack of documentation, know-how by craftsmen, and disinterest to shortcomings or lack of familiarised building materials. However, several communities and designers have come up with ways to resuscitate these architectural features using modern technological means without the loss of architectural value.

2.3 Modernist Interpretations in Regard to Vernacular Architecture

The advent of globalization and industrialization has brought about easier access to technology of building thereby making buildings around the world to be visibly homogenous. According to Robert Adam (1990), the demand for distinctive new structures and commercial modernism are examples of how a global economy

has influenced architecture around the world. Earlier, buildings would differ from location to location and that created a sense of architectural diversity and variety (Figure 9 & 10).



Figure 9 & Figure 10. Buildings around the World before and after globalization (Arjen Oosterman & Brendan Cormier, 2014).

Concerned about the disappearance of cities' distinctive identities, professionals in this industry have developed strategies for integrating vernacular identities with contemporary architecture. These concerns also relate to reasons for sustainable design adaptations from vernacular architecture. As mentioned by Shahid (2013), the architecture of the past has elements of sustainable design, and designers today are taking lessons from that.

Salman (2018) specifies that architecture doesn't have to look the same in all regions and at all times but with careful reasoning of vernacular ways, we can perceive and interpret the architectural context and preserve the identity of a place. This type of interpretation is seen in the Masdar City of Abu Dhabi (Figure 11). The Masdar City near Abu Dhabi adapts the use of locally available green materials, basic facades, courtyard house designs, staggered walkways, etc. from the elements of Arab vernacular architecture to solve environmental and social sustainability needs (Leon Kaye, 2012). These elements though were better interpreted and modernized to fit into the modern cityscape the designers wanted to achieve.

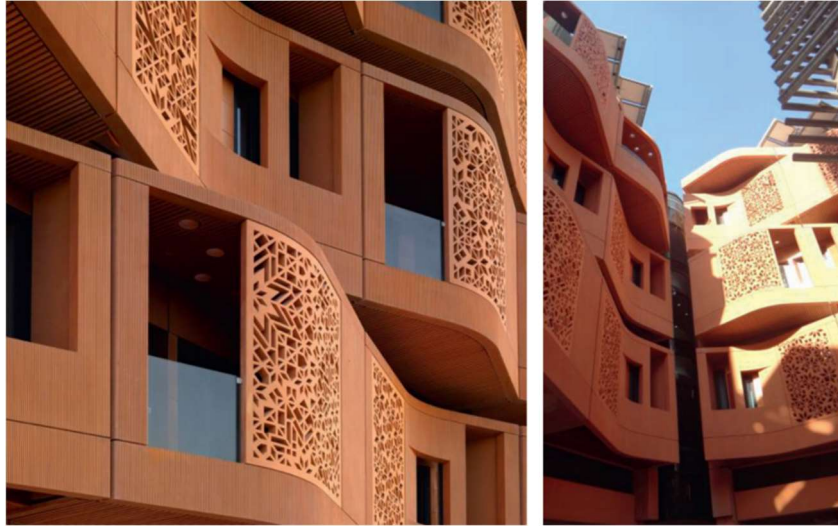


Figure 11. An interpretation of Arab vernacular architecture in Masdar City
(Salman, 2018).

Another interpretation of vernacular architecture is seen in the new vernacular Minangkabau Houses of Indonesia. It is an example of interpretation in which traditional design and spatial arrangement are maintained but modern building materials and construction methods are used. According to Marcel Vellinga (2007), It is obvious that many distinct vernacular buildings have been lost throughout history and that many more face imminent extinction. However, he adds that, despite the effects of modernization and globalization, vernacular culture has managed to survive and thrive, leading to an amazing process of resurgence. Traditional Minangkabau houses are reconstructed with timber, rattan, bamboo, and palm fiber (Figure 12). The timber was used to make the posts, roof, floors, and walls, and sometimes rattan and bamboo were also used in making floors and walls, and palm fiber is used to thatch the distinctive upwardly spreading roof (Vellinga, 2007). And the interiors in the houses consisted of an open hole at the front that serves as a living space and also for entertaining guests while at the rear of the house, there are small enclosures that were used as bedrooms (Vellinga, 2007). Furthermore, in the new vernacular Minangkabau houses, all the design elements have been retained but with the use of modern materials and construction techniques(Figure 13). Built on piles, they are built using concrete break and corrugated iron or zinc roofs. To create the illusion of the vernacular, the walls are occasionally fitted with wooden panels

(Vellinga, 2007). It is evident that design elements have been kept without changes but in the building materials. This is another way that vernacular architecture has been interpreted today.



Figure 12 & Figure 13. The vernacular and the new vernacular Minangkabau houses showing similar façade with the use of different materials

(Vellinga, 2007).

Gando primary school in Burkina Faso is another example of a modern interpretation of vernacular architecture that solved many contemporary issues of school design in that region. The design aim was to create a school building that solved the problem of excess heat, poor lighting and ventilation, high cost, and resource availability (Kéré Architecture, 2003). The main building material used was structurally robust bricks made with clay and cement which were locally found and provided thermal comfort within the school. The popular metal corrugated roof utilized in the country for roofing was used, but because it absorbs so much heat, the solution was to move the roof away from the interior spaces (Figure 14) (Kéré, 2003). Traditional building techniques were integrated with current technical technologies for this project to offer the finest quality building solution while

simplifying construction and future upkeep (Kéré, 2003). The project placed a high value on community participation in the construction process, which preserves one of the characteristics of vernacular architecture.



Figure 14. Gando primary school by Francis Kéré
(Kéré, 2003).

Old, vernacular architecture should be elevated through creativity and cultural sensitivity when it meets new, contemporary technologies and parameters. In terms of material life spans and production ease, it resolves the deficiencies and issues encountered in the past in a shorter amount of time (Salman, 2018).

Chapter 3

Vernacular Architecture of Nigeria

Nigeria is a nation on the west coast of Africa. Bordered by Niger, Benin, Cameroun, and the Atlantic Ocean (Figure 15), Nigeria has a diversified terrain, with equatorial climates that range from dry to humid. The most diverse aspect of Nigeria, though, is the people. There are hundreds of languages spoken in the nation, including English, Yoruba, Igbo, Hausa, Fula, Edo, and Ibibio. The nation possesses a wealth of natural resources, including significant reserves of natural gas and petroleum. Nigeria as we know it today began in 1914 with the union of the British Protectorates of Northern and Southern Nigeria. On October 1, 1960, the nation attained independence. In 1963, it established a republican constitution but decided to continue being a part of the Commonwealth (Toyin O. Falola, J.F. Ade Ajayi, Anthony Hamilton Millard Kirk-Greene & Reuben Kenrick Udo).



Figure 15. Map of Africa showing Nigeria (Falola, Ajayi, Kirk-Greene, & Udo, 2023).

Nigeria has three distinct climate zones, which have affected their kind of architecture: a tropical savannah climate throughout most of the country's central

regions, a tropical monsoon climate in the south, and a hot, semi-arid Sahelian climate in the north. As a result, precipitation levels decrease from south to north along a gradient. The heat from the Sahara desert accounts for the hot-dry harmattan wind in the northern states, and the cool wind from the Atlantic Ocean brings about the cool humid wind in the southern states of the country (Falola, Ajayi, Kirk-Greene, & Udo, 2023).

The climate of the country affects the vernacular architecture across the three regions. The north is drier, has low vegetation, and is hotter than the south due to the sparse rainfall there. This led to the use of earth as a construction material because it offers thermal comfort by absorbing solar heat during the day to keep the interior cold and releasing it at night to warm the building. The South adopted roofing designs that are compatible with the heavy rainfall that they experience (Danja, Li, & Dalibi, 2017). This and other factors that influenced Nigeria's vernacular architecture are discussed in the following section.

3.1 Nigerian Vernacular Architecture and Preservation of Vernacular Architecture

Nigerian Vernacular architecture goes beyond instinct. It has evolved from purposeful attempts to create a functional and psychological sense of place, as well as a three-dimensional form that is appealing. Although not monumental, the traditional house form provides the bedrock of vernacular architecture (Ekundayo Adeyinka Adeyemi, 2008). According to Zbigniew Dmochowski (1990), a sense and representation of community are very important in Nigerian vernacular architecture. Vernacular architecture in Nigeria can be represented and expressed through the use of building materials, architectural form, and construction techniques. Early communities were made up of temporary buildings to fit the nomadic lifestyle; over time, however, those buildings became more permanent and buildings emerged to meet requirements other than shelter (Mohammed Sagir Kabir, 2016; Faisal Koko Auwalu, 2019). The architecture of the nation's three major tribes—the Hausa, Yoruba, and Igbo tribes—has been influenced by many factors. According to Mai and Khalil (2019), British colonialism, the trans-Saharan trade, the end of the slave

trade, and the growth of religions like Islam and Christianity have all had an impact on the nation's architecture. The northern region acquired characteristics mostly from Islam and trade from North Africa, while the coastal south was influenced by Brazil and colonial architecture. Vernacular architecture has shown shared characteristics of response to climate, usage of indigenous technology, and socio-economic elements despite the variances within the country (Mai & Khalil, 2019).

The three main tribes developed the architecture of their regions as follows – the Hausa from the northern part of Nigeria, the Yoruba that occupy the southwestern states, and the Igbo in the southeast (Figure 16) (Adeyemi, 2008; Dmochowski, 1990; Auwalu, 2019; Kabir, 2016).

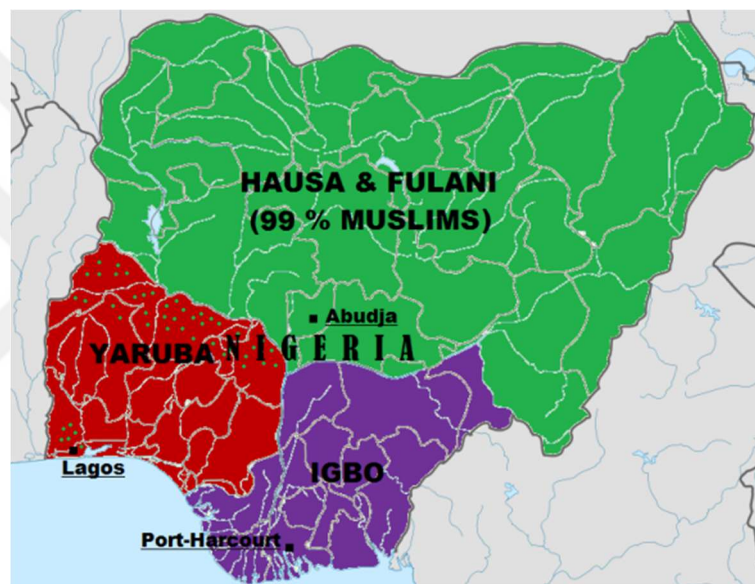


Figure 16. Map of Nigeria showing the three major tribes (Kabir, 2016).

The Hausa are the most dominant tribe that occupies the majority of northern Nigeria. Large social gatherings and agricultural traders of textiles, leather, and basketry are traditional characteristics of the Hausa (Kabir, 2016). Islam is the religion they practice the most, and its influence may be observed in their dress, social relations, segregation (Figure 17), and architectural design (Oluwagbemiga Paul Agboola, 2011). According to Auwalu (2019), Hausa vernacular architecture, or VANN, effectively and contentedly meets the needs of Hausa traditions. Climate,

religious, and cultural constraints all have an impact on the structure and design of their homes. The utilization of readily available materials, including wood, stone, plants, and earth, governs construction. They created a method for improving the soil's structural and aesthetic qualities prior to construction through the addition of reinforcement and additives (Dmochowski, 1990). The ribbed vaulting, domes, and wall ornamentation produced by VANN are the most known of its features (Adeyemi, 2008). Due to their understanding that mud provides warmth in the winter and coolness in the summer, they made use of its thermal comforting qualities in their architecture. According to Auwalu (2019), a Hausa city's three main features are its palace, mosque, and market, all of which will be covered later in this chapter.

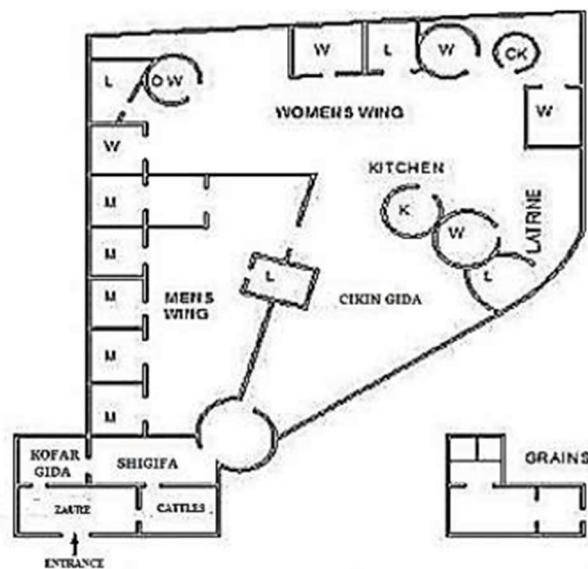


Figure 17. An example of a Hausa compound
(Auwalu, 2019).

The Yoruba are the second largest ethnic group after the Hausa in Nigeria. They live in the southwest of the country and speak the Yoruba language (Adeyemi, 2008). They belong to a social group and are well known for their art of woodwork, terracotta, and bronze sculpting. The majority of Yoruba people practice Christianity, however, some of them also follow the religion of Islam and others worship idols. Due to their proximity to the port, they were more susceptible to importing formal education, trade in cash crops, and architectural design (Kabir, 2016). Yoruba vernacular architecture has been passed from generation to generation, the most

important aspect of their architecture is the compound as they practice and promote family cohesion. Their architecture is also affected by climate religion and culture. According to Adeyemi (2008), the centripetal nature of Yoruba people allows for rooms to be organized around a courtyard (Figure 18) which is used for family meetings and entertaining guests. The same materials (timber, stone, plant, and earth) used in Hausa land are also used in Yoruba land building. The quality of the soil here is such that it does not require any additives. For roofing hipped roof for its drainage qualities is used due to the location of Yoruba land in the rainforest (Auwalu, 2019).

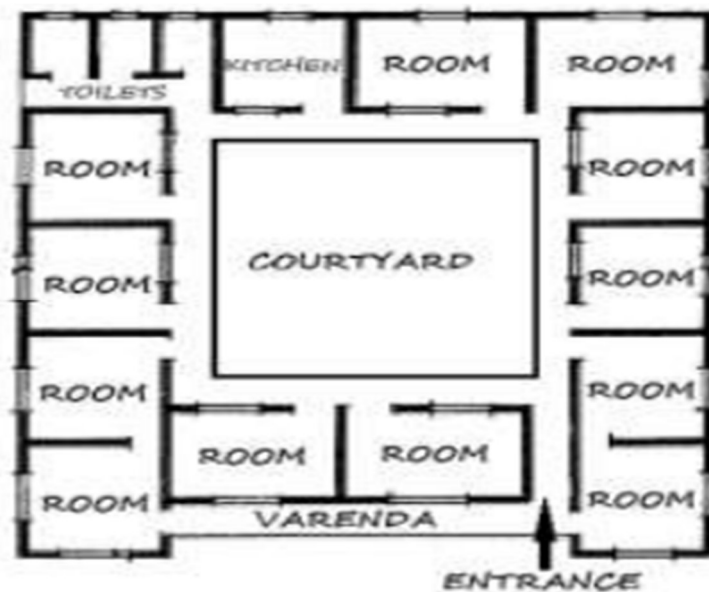


Figure 18. A typical Yoruba compound

(Auwalu, 2019).

The Igbo are found in the southeastern part of Nigeria they live in scattered towns and villages and speak the Igbo language they are very industrious and engaged in a wide range of commercial activities (Auwalu, 2019). Communality is a significant component of Igbo cultural life, and it is interwoven in the design of the settlement pattern, with their buildings attempting to incorporate spiritual, cultural, and lifestyle values into their architecture, claims Dmochowski (1990). On the other hand, it was stated that Igbo architecture, as well as architectural monuments like ancestor shrines, expressed the plurality of the Igbo culture (Adeyemi, 2008). Community areas are often located in the core of settlements and are used for public

gatherings, interactions, and meetings with the community. Festivals and masquerade performances that take place in the village square are significant to the Igbo people. Roof forms are built in accordance with the building forms which can be of different shapes (Dmochowski, 1990). The dominant materials used in Igbo architecture are clay, grasses, and bamboo.



Figure 19. A steeply pitched roof from Igbo vernacular architecture (Kabir, 2016).

The hot humid climate provides for the use of a steeply pitched roof (Figure 19) (Auwalu, 2019). Here, construction is a social activity that is done by people to bring them together (Kabir, 2016).

Nigeria is a nation with a rich cultural past, both tangible and intangible, including vernacular architecture. Vernacular architecture in Nigeria consists of buildings, city walls, fortifications, shrines, and sites many of which have not been preserved or listed for preservation. The only entity in the nation with authority over heritage legislation is the National Commission for Museums and Monuments (Adewumi, 2022). Its original name was the National Antiquities Commission or NAC, and it is in charge of establishing and overseeing museums as well as seeking historical sites. It makes sure that traditional arts and cultures are well-preserved and

explored (Onyima, 2016). Sections 64 to 69 of Nigeria's 1992-enacted National Urban and Regional Planning Act addressed the NCMM's heritage preservation concerns. These concerns included the plans for the protection of historic buildings and specific sites. The act provided for a law that mandates getting approval from the NCMM and other relevant authorities like the Development Control (DC) before making modifications to any historic or protected area. It also specified the need for compiling a list of places of historic significance. Additionally, it stipulated the consultation with groups and individuals with specialized knowledge in this field before any work is carried out on heritage sites (Adewumi, 2022). However, neither the planning nor the heritage authorities have institutionalized these provisions, according to Adewumi (2022). As a result, heritage preservation is not properly carried out in Nigeria, where only traditional approaches are employed without the addition of any new methods (Okpalanozie & Adetunji, 2021).

Adewumi (2022) says that many vernacular architectural elements and sites have been lost due to a lack of preservation efforts, preservation guidelines, and regulations. Preservation efforts even when made by the regulatory bodies have faced challenges in implementation due to little cooperation and contribution from the government. The preservation guidelines given are yet to be fully implemented and heritage are left to their fate. Historic palaces have been demolished to make way for more contemporary structures, vernacular architecture walls have been destroyed, and other monuments have been torched. According to Bilyaminu (2017), the cause of this is the use of contemporary building materials, which endanger preservation when applied for the restoration of historic structures, particularly palaces. Adetunji (2022) believes that transatlantic slavery, which led to changes in building materials by slave merchants in Badagry, Lagos who were viewed as elite, is one of the causes of the loss of architectural heritage. Another reason highlighted was the societal notion that anything constructed of earth will eventually return to earth, which is why some old earthen buildings were left to deteriorate. He also claims that the population has been replaced by people who have no connection with the architectural heritage. Due to the changes in the demography identity of the community is changed - these newcomers to the region are not connected with the history of the country. In addition to that, they have no loyalty to the architectural

heritage and its conservation and preservation. Onyima (2016) adds that disputes and the results of societal change, as well as a lack of funds from the government and new government development initiatives, all contribute to the demolition of historical buildings. Other factors include the low priority given to the preservation of historic structures at the local, state, and federal levels; as a result, town planning organizations are not sufficiently strengthened to take on additional obligations (Adewumi, 2022).

Providing the necessary protection to historical local buildings will benefit Nigeria a lot. Tourists and Nigerian natives coming to Nigeria from different parts of the world for tourist purposes, and visiting architectural heritage items will benefit the country's economic development and publicizing its cultural values (Onyima, 2016). To make this possible, more research must be done on modern preservation approaches, and experts working in the field and students at higher education institutes of architecture need to be made more aware of these issues (Bilyaminu, 2017; Okpalanozie & Adetunji, 2021). For proper upkeep, it is recommended by Bilyaminu (2017) that an understanding of the initial building materials used in making these buildings is necessary for their preservation. Finally, according to broader research by experts on this subject, it is believed that if preservation policies and sanctions are clearly stated, it could aid in the preservation process and better its implementation. Okpalanozie and Adetunji, (2021) add that in locations where the government might not be able to fund preservation requirements, stakeholders might be permitted to step up (Okpalanozie & Adetunji, 2021; Bilyaminu, 2017). According to the sources above, even though there are certain obstacles, Nigeria is on the right track toward preserving the identity of vernacular architecture. However, the adoption of these solutions might be possible with improved planning and understanding.

3.2 Focusing on Vernacular Architecture of Northern Nigeria (VANN)

Historically, northern Nigeria's economic and political strength lay in Hausaland, also known as *Kasar Hausa*. The majority of northern Nigeria is made up of states that speak the Hausa language. Hence by default Hausa architecture is

referred to as the Vernacular Architecture of Northern Nigeria, VANN. The Hausa people's first settlement in Nigeria began in 100 to 1200 AD - they lived in round mud huts with thatched roofs and other temporary structures due to their nomadic lifestyle (Cliff. J. Moughtin, 1964). As their trade and lifestyles developed over time, their architecture and settlements became more permanent. Over time, various types of buildings required for institutional, educational, and commercial uses began to be constructed. This expansion led to the need for leaders and heads who were referred to as emirs and led their emirates in palaces (Saad, 1981). A typical Hausa city would have three focal points which are Mosque, palace, and market. Most of the neighborhoods were built around these three points. There were many different reasons that contributed to VANN's evolution. According to Sadiq I. Yakasai (2016), the primary element was the influence of Islam and the Islamic architectural styles that were brought over from North Africa. Islam entered Nigeria via trade routes that crossed the Sahara desert from northern Africa, as seen in Figure 20. Islamic principles were incorporated into the creation of the architectural type due to the widespread acceptance of Islam by the population of northern Nigeria.

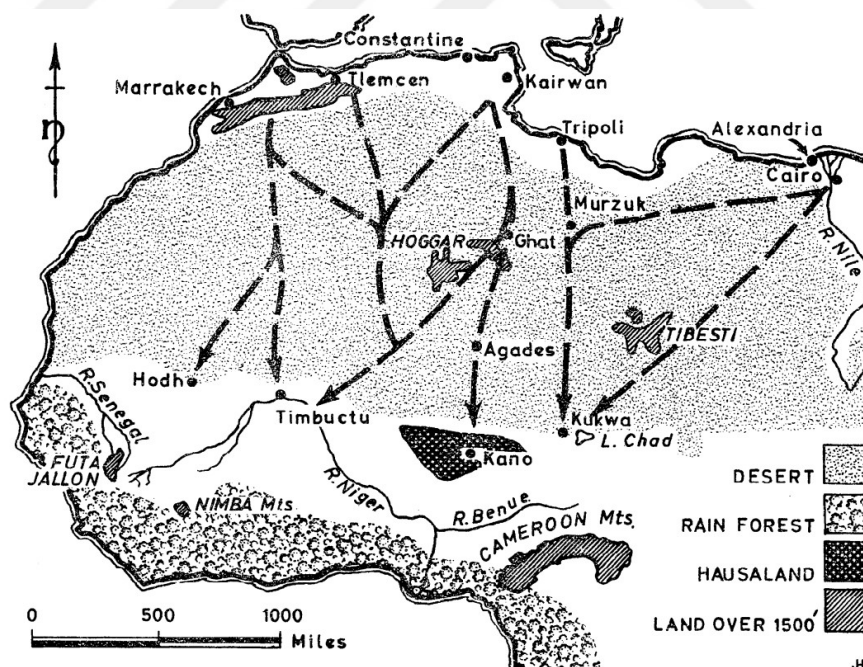


Figure 20. Trade routes across the Sahara desert
(Moughtin, 1964).

It can be said that the Hausa culture is one of the main determining factors in the development of the special architecture here. From this, it can be understood how culture affects human behavior and history (Moughtin, 1964). Oluwagbemiga Paul Agboola and Modi Sule Zango (2014) claim that Hausa culture includes upholding kinship ties and societal norms that place an emphasis on religion, way of life, dress, and social interaction. As a result, this cultural outlook influenced architecture. The taboos and standards that the Hausa people adhered to also had an impact on their architecture, as seen by the ways in which they placed their buildings to face or avert particular directions (Abdulrazzaq Ahmad Muhammad-Oumar, 1997). A courtyard design for dwelling units was incorporated as a result of the demand for segregation and privacy (Agboola & Zango, 2014). According to Moughtin (1964), the Hausa people's skill at decoration and dyeing contributed to and is reflected in the craftsmanship and ornamentation of buildings. Another important factor they considered is the climate which includes rainfall, temperature, wind, and humidity (Muhammad-Oumar, 1997). Northern Nigeria is characterized by very little rain and extreme temperature differences between day and night (hot-dry air in the daytime and extreme cold in the nighttime). By introducing sun shade devices through the use of low-hanging roofs and the use of mud, which is a thermally comfortable building material, VANN was developed to accommodate the effect of the day heat and the night cold (Muhammad-Oumar, 1997). The socio-economic status of kings and other important residents, who were compelled to display their wealth in their buildings, as well as historical developments and colonialism also contributed to the development of Hausa architecture (Agboola & Zango, 2014). Building materials used were cheap, locally available, and traditionally processed like plants and Earth; This with other features that are present in Hausa Architecture is detailed in the next section.

3.2.1 Building typologies in VANN. As underlined before a Hausa settlement has three principal points -the mosque, the palace, and the marketplace-, and dwelling neighborhoods are built around them (Joyce Lodson, John Emmanuel Ogbeba and Ugochukwu Elinwa, 2018). The mosque serves as the spiritual center, the palace as the administrative center, and the market for commerce (Muhammad-Oumar, 1997). *Gidan Sarki*, the Emir's palace, is a bigger version of a family compound, *gida*. The family compound refers to dwelling units as seen from the research of Muhammad-Oumar (1997) and Kahera (1987). The room, the courtyard, and the outer wall are all identical architectural features between the mosque, the housing compound, and the palace. The Hausa builder combines these three components in fascinating ways to create various compounds (Kahera, 1987). Moughtin (1964) wrote after visiting these cities that the family compounds are connected to the market, the Friday mosque, and the city walls by footpaths sufficiently sized to accommodate a well-loaded donkey.

A Hausa compound caters to the social and communal ideals of its residents. According to Moughtin (1964), architectural designs take into account values dictated by the need for privacy, the existence of an extended family, and accommodating non-family visitors. Although the family compounds vary in size, they all have a similar layout with rooms arranged around the courtyard (Kahera, 1987; Moughtin, 1964). The family compound changes to accommodate family growth inside the compound walls. Like the *zaure*, the wall provides security, seclusion, and a visible barrier. Male guests must enter through the *zaure* entry hall, which acts as a control mechanism (Figure 28). More familiar visitors are entertained in the second entry hall (*shigifa*). A forecourt (*kofar gida*) separates the *shigifa* from the *zaure*, and it is the sole way to access the restricted inner court (*cikin gida*). Only close relatives, females, and boys under puberty are permitted to inhabit the *cikin gida*. Private sleeping quarters, a kitchen, and space for the extended family are available in the rooms surrounding the *cikin gida* (Kahera, 1987).

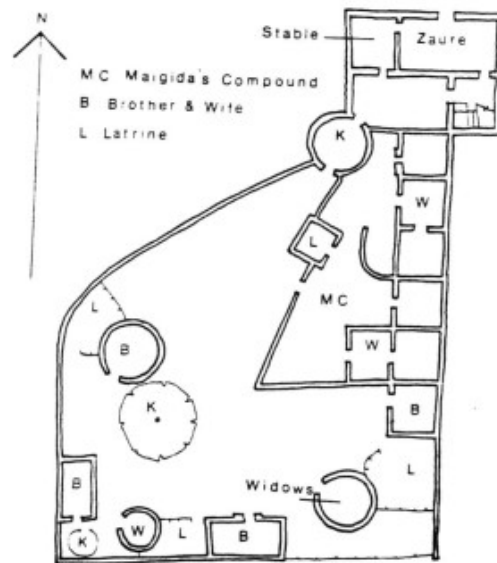


Figure 21. A typical Hausa compound showing the *zaure* (Kahera, 1987).

The Hausa palace has all the characteristics of the compound but is scaled up, therefore it can be thought of as an expanded version of the compound (Figure 29). The *shigifa* in a Hausa compound is analogous to the palace's entrance. The Emir's palace is typically located next to the Friday mosque and the town square (*dandali*), serving as a visual representation of the Emir's leadership's strength, sense of community, and religious authority (Kahera, 1987). Moughtin (1964) states that as a result of its much bigger scale, this construction requires a longer span; therefore, vaulted structures using *azara* beams are used, allowing them to span 7 to 8 meters in width and 8 to 9 meters in height. The palace is the highest point of Hausa architecture and the most encompassing of its features - it serves as a symbol of power, culture, and regalia (Samuel, 2022). The Emir, who also serves as the *Imam* or head of the prayer, has easy access to the mosque owing to the proximity of the Hausa palaces (Kahera, 1987).



Figure 22. Plan view of Zaria Emir's palace (Kahera, 1987).

The mosque is another essential part of a Hausa city as it serves as a place for worship for the Muslim majority population. According to Adeyemi (2008), mosques employ all of the Hausa culture's architectural forms and practices. Islamic law provides for construction methods that support privacy. These ideas also had an impact on mosque architecture. Mosques are designed using a formalized, simplified type of ornamentation (Kahera, 1987). The mosque's structure incorporates domes, therefore the Hausa vault is primarily used to support weight and provide a wider span (Kahera, 1987).

3.2.2 Special characteristics of VANN. VANN buildings have common features which portray their own identity and differentiate it from other architecture. Some of the evident features are intricate ornamentation on facades, roof pinnacles or Zankwaye, hierarchy, and the use of building materials like earth, grasses, stones, and timber. This research groups the features of VANN into four; Spatial organization, ornamentation, building materials, and structure.

3.2.2.1 Spatial organization. The common spatial organization in VANN was created to accommodate the Hausa people's way of life. The Hausa house's form was influenced by the requirement for privacy and the continually growing family size. According to Agboola and Zango (2014), in order to accommodate their polygamous nature -that is, rooms for additional wives and children- the Hausa developed the use of courtyards surrounded by several rooms, or daki. As seen in Figure 21, the courtyard also provides for privacy and seclusion of the females in the house through the provision of an outdoor space inside the house (Saad, 1981).

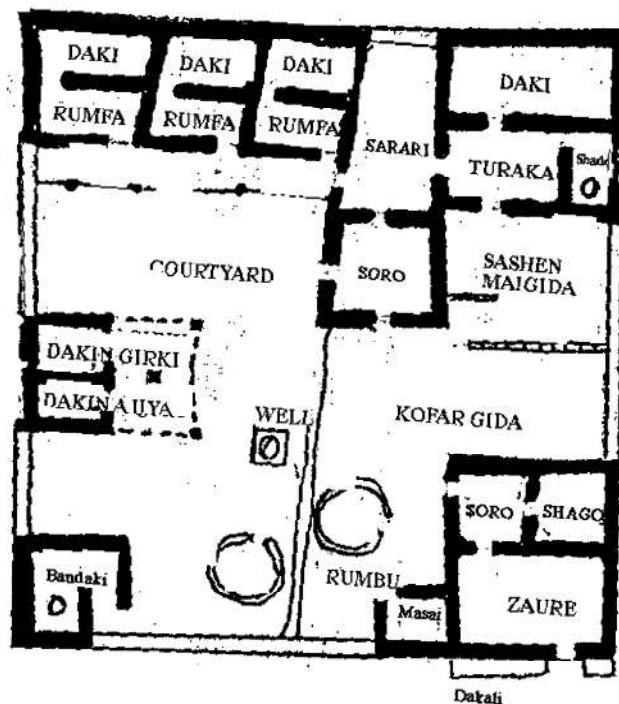


Figure 23. Plan of a typical Hausa house showing *daki* and *zaure* (Saad, 1981).

Another element that controls privacy and seclusion in a Hausa building is the *zaure* which could roughly be translated as an entry hall where visitors are received. This *zaure* in any building is used for the purpose of safety, privacy, ethics, decorations, and administration (Agboola & Zango, 2014). In the dwellings, privacy is important and thus the *zaure* is where male guests stay for greetings and other related activities. But in palaces, the purpose of safety comes forward and it is used as a space for the introduction of guests to the servants before they go to meet the king (Muhammad-Oumar, 1997). The size of the *zaure* is determined by the size and

wealth of the occupants of the house. Circulation through the building is only allowed through the *zaure* (Moughtin, 1964).

3.2.2.2 Ornamentation. Ornamentation indoors and outdoors is among the ways of expressing culture, status, and stories of the Hausa people. These have developed from being large decorative motifs to smaller colorful interlaced symbols and relief patterns. Adamu (2005) categorized Hausa decoration into three; surface design, calligraphy, and ornamental. Surface designs are carved, engraved, or made as reliefs on walls. The most popular design is the Arewa knot (Northern knot) or *dagin arewa* as seen in Figure 22. Other prominent elements are the bow and arrow, the spear, and the sword of office. Some buildings may have unique designs for the city to which they belong, like the talking drum symbol for Bauchi City and the cow for Gombe City (Ado Danrimi Garba, 2023).



Figure 24. The Arewa knot surface design
(Author's archive, 2023).

Other ornaments protrude from the roof like the *zanko* or roof pinnacle and *indararo* or roof gutter (Adamu, 2005). The *zanko* is seen at corners and specific parts at the top of the roof of Hausa buildings (Figure 23).



Figure 25. Zanko as seen on the roof of Gidan dan Hausa house in Kano (Samuel, 2022).

The *zanko's* primary use is as a decorative element and a representation of regalia, but it has also been employed over time to gain access to the roof for maintenance purposes and to provide load to areas of the roof that are susceptible to rain (Samuel, 2022).

3.2.2.3 Building materials. The main materials used for construction are Earth (mud), timber, reeds, grass, and stone (Moughtin, 1964; Dmochowski, 1990). Mud is the general material that is used for most of the construction of walls, foundations, arches, roofs, vaults, columns, and beams. Because the Hausa builders had a thorough understanding of the nature of mud as a building material over a long period of its application, the renowned Hausa Architecture of mud structures was made possible (Adeyemi, 2008). It is reinforced with grass for wall-making to improve tensile strength. The mud is stomped and allowed to sun dry for days in a pear-shaped brick form called *tubali*, which is later laid using mud mortar (Figure 24) (Moughtin, 1964). According to Garba (2023), plastering is done with mud mixed with *Makuba* which gives it a rich red color when exposed to water. Mud used in roofing is mixed with the ashes from wood to prevent leakage (Garba, 2023).



Figure 26. Mud bricks or *tubali* used in wall construction
(Kabir, 2016).

Timber is used for the reinforcement of mud in beams, columns, arches, and wall frames. The most popular timber used is the *azara* wood from the *giginya* tree, a fibrous palm tree. This wood was chosen for its strength and its ability to resist termite attack (Moughtin, 1964). According to Dmochowski (1990), the *azara* beams are also used to build frames, beams, brackets, and corbels, which serve as supporting elements for flat and domed roofs (Figure 25). The *azara* are tied together using plant ropes for use in columns and beams (Moughtin, 1964).



Figure 27. Azara timber used for roofing
(Author's archive, 2023).

In some areas thatch from grass is used for roofing, and when stone is available, it is used for the foundation (Danja, Li, & Dalibi, 2017).

3.2.2.4 Structure. The general structural characteristics of the buildings of Hausa are the dome and Hausa vault. So, here there is an emphasis on these two. The vault was used in areas with much larger spans since the *azara*, according to Moughtin (1964), came in a maximum span of 6ft. Therefore, in spaces of larger spans, mud columns, beams, and arches were used. An interlocking of these arches is what makes the vault or *bakan gizo*, which directly translates to spiderweb. Akel. I. Kahera (1987) buttresses that, contrary to the North African domes, the Hausa vaults, and domes are constructed on the same structural theory that is used in the design of reinforced concrete. Adeyemi (2008) adds that the development of the Gothic vaults and the Hausa mud vaults are both founded on logic-based structural assumptions. The Friday mosque in Zaria (Figure 26 & 27), which was built in 1840 by Muhammadu Durugu (Babban Gwani), makes the greatest and most daring use of these structural components, although there is little evidence to prove that he invented it (Kahera, 1987).

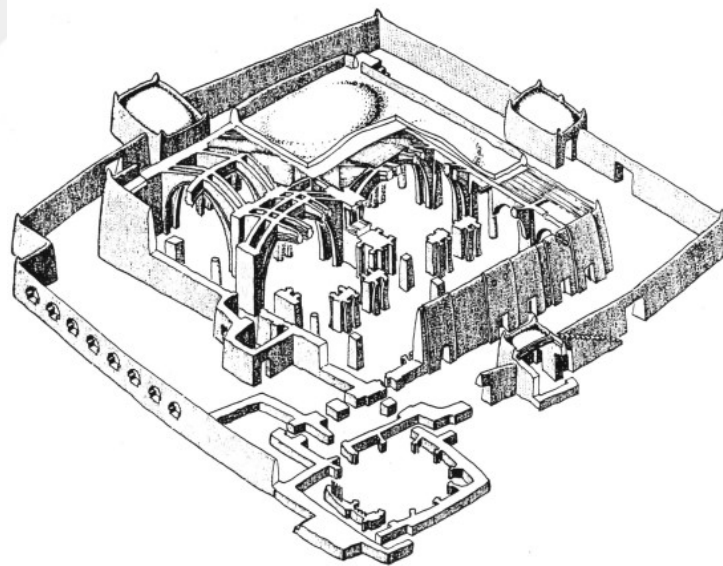


Figure 28. Axonometric view of the Friday mosque in Zaria showing structural elements

(Kahera, 1987).



Figure 29. Interior view of the Friday mosque in Zaria
(Kahera, 1987).

Through these structures, Hausa builders like Babban Gwani have shown not only their mastery of the craft but also their exceptional skills in shaping stunning shapes in space (Adeyemi, 2008).

3.2.3 Preservation problems associated with VANN. Vernacular architecture preservation has proven challenging around the world, particularly in developing countries like Nigeria. The absence of government funds makes it difficult for preservation regulating organizations like the National Commission for Museums and Monuments, NCMM, to carry out its preservation initiatives (Adewumi, 2022). Old mosques, city walls, landscapes, palaces, and museums are among the conserved monuments on the NCMM's list, some of which can be found in northern Nigeria. One of the buildings on the list is the Gidan Madaki house in Bauchi State, Northern Nigeria (Figure 30). It was constructed in 1860 by Babban Gwani and is an excellent representation of VANN.



Figure 30. Gidan Madaki, Bauchi is one of the monuments listed by the NCMM (NCMM).

It has undergone some preservation work since 1956 when it became recognized as a monument. For instance, between 2018 and 2021, NCMM carried out a visual examination and monitoring where they found growing cracks and weeds, termite attacks on different sections of the building, and deterioration of domes, columns, and *azara* in the roof. Herbicides were sprayed to kill weeds, the damaged areas were repaired with indigenous materials, and the entire structure was fumigated (Okpalanozie & Adetunji, 2021).

Preservation of vernacular structures is a process faced with a plethora of challenges. Amongst these are cost, colonialization, and other factors. Moughtin (1964) claims that when the British arrived in Nigeria, they brought a different style that greatly affected and transformed buildings in northern Nigeria. For instance, the Shehu mosque in Sokoto was demolished, and its place was taken by a mosque built entirely in a foreign style with little connection to the local architecture. The impermanence of mud and the frequent need for repair were also noted as contributing factors in the widespread usage of longer-lasting building materials (Moughtin, 1964; Danja, Li, & Dalibi, 2017). Mud is a material that weathers easily by nature and buildings made with mud have to be maintained yearly by plastering with the same material due to weathering and water damage (Kabir, 2016). In their research, Danja, Li, and Dalibi (2017) list some issues that are related to the preservation of VANN, such as socioeconomic factors, climate, and modernization. Traditional buildings have a low level of social acceptance and a high maintenance cost, which prompted their modernization and replacement. The absence of qualified artisans and master builders in this field is another factor contributing to the lack of preservation. A lack of preservation has also been attributed to human nature, which makes us forget and disregard vernacular architectural features (Danja, Li, & Dalibi, 2017; Bilyaminu, 2017).

Some probable solutions for the preservation problems of VANN are given in literature. Adeyemi (2008) suggests that the government can aid in the preservation of heritage sites through funding projects and collaborations with heritage preservation bodies. Umar (2018) proposes in his research that creating a framework for preservation can improve heritage safeguarding while decreasing the loss of it. The presence and use of a guideline when preservation is to be done will aid in the protection of vernacular structure thereby preserving architectural heritage and identity. Another is the use of modern techniques to provide possible solutions to the shortcomings of the existing vernacular building materials (Lodson, Ogbaba, & Elinwa, 2018). The shortcomings of mud as a building material can be curbed with the aid of modern techniques. These solutions if used could work in resolving the problems when it comes to the preservation of VANN buildings.

Chapter 4

Studying the Effects of VANN on Palace Designs of Northern Nigeria

The Vernacular Architecture of Northern Nigeria, or VANN, was an integral element of a larger cultural agenda, acting as both a means and a symbol for conveying ideas on power, religion, and aesthetics. By utilizing a wide variety of architectural features and designs in buildings, Hausa Royals and the wealthy built expansive complexes with significant edifices and meticulously ornamented facades. Among these features were vaults, double-volume constructions, huge domes, and spacious interiors and entrances (Samuel, 2022). The boldest architectural marvels were produced by Hausa masons and architects using a variety of naturally occurring construction materials, particularly palm wood, azara, and rammed earth (Kahera, 1987). These structures fulfilled their functional and monumental objectives while also befitting the region's hot, dry climate (Samuel, 2022). These architectural features that served monumental purposes were used in the development of palace architecture.

Palaces used to be political centers in Hausa cities from the 15th century and hold an extent of significance today. As administrative structures in cities, they were developed as monuments to be edificial and portray power and cultural significance. It is possible to mention that they are the most encompassing example of Hausa vernacular architecture. As stated by Kahera (1987), a Hausa palace has three main features just like the dwelling unit; the *zaure*, the *kofan gida*, and the *cikin gida*. In the palace, the *zaure* is an extended form of a reception hall where the king entertains his guests, the *kofan gida* being the entrance and the *cikin gida* as the inner quarters for the family. They follow a hierarchy of privacy from the entrance being a public space, the reception halls being semi-public and the inner residential quarters as the private spaces. In all palaces across Northern Nigeria, this has been retained. Entrances could be two or more in a palace, a main entrance at the front, and one or more at the other ends of the palace (Kahera, 1987). The reception halls or *soraye* are usually plentiful to accommodate the king's visitors and guests, mostly in order of importance. According to Muhammad-Oumar (1997), pre-colonial officials would be entertained in these spaces, and now it serves the same for other royals and higher

nobles. A palace could further be divided into two main parts; the palatial complex and residential quarters. The palatial construction is comprised of a complex of buildings and open spaces partially open to the public that would be used for hosting palatial events when they arise. while the residential quarters and inner quarter houses the royal family and the King's wives (Samuel, 2022). The palace is usually located at the center of the town with great proximity to the mosque as the emir sometimes officiates the prayer (Kahera, 1987).

The main building materials that were used to construct vernacular palaces were mud, timber, and grass, and the evolution of form was possible due to the availability of these materials. Mud is the most common and abundant material amongst these and historically, magnificent structures were made using mud (Danja, Li, & Dalibi, 2017). It is used in making the majority of the elements in a Hausa structure even though sometimes it is accompanied by grass, timber, or stone. It is mixed with grass to make pear-shaped bricks called *tubali*. Figure 31 shows the process of making tubali bricks with mud.



Figure 31. Making of *tubali* mud bricks

(Dmochowski, 1990).

According to Danja, Li, and Dalibi (2017), stone is used in some parts of the foundation to prevent water from going upwards into the building. Timber, on the other hand, provided tensile strength to mud, it is usually gotten from the *giginya* tree in the form of azara beams and is used with mud to make columns, arches, vaults, and roofs (Figure 32) (Danja, Li, & Dalibi, 2017). Several pieces of timber would be

connected with the use of ropes made from *kaba*, a plant used for basketry and mat making. They are then patched together using mud and the shape of the element is formed (Garba, 2023).

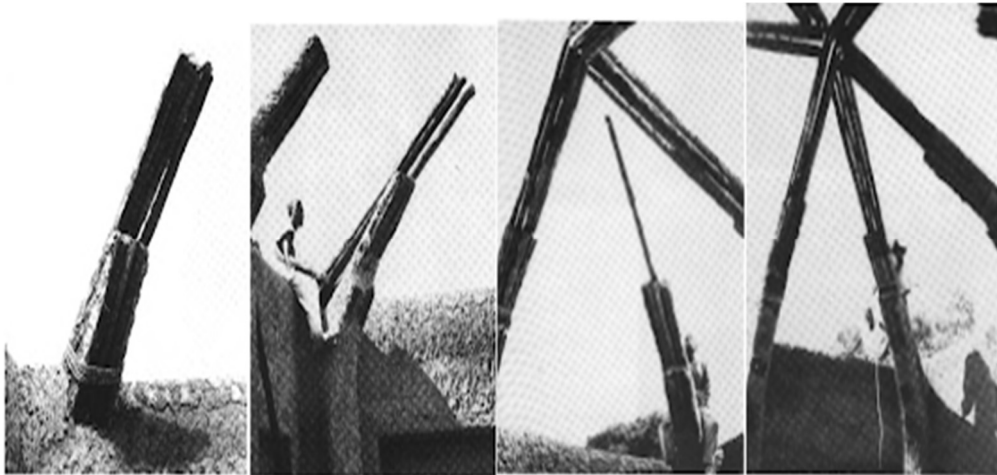


Figure 32. Process of making a dome roof using *azara* timber
(Dmochowski, 1990).

Grass improves the quality of mud when mixed and left to decay, this gives a sticky mixture that is used as mortar and for brick making.

Given the prevalence of polygamy in Hausaland, the size of the royal family's residence would have to be suitable for accommodation. Because of the large scale and size of the construction, the palaces employed architectural features that were not common in the dwelling units. The vaulted spaces of the interior of a typical Hausa palace employed combinations of *azara* timber that is cantilevered at angles from the walls to create arches to support the roof allowing for spaces spanning over 8 meters in length and tall roofs up to 9 meters in height (Kahera, 1987).

The interior and exterior walls of palaces are frequently ornately decorated with a variety of Hausa and arabesque motifs, according to Muhammad-Oumar (1997), and comparable decorations can be found in mosques and residential buildings. Some of these ornaments are the Arewa knot (*dagin arewa*) design, the bow and arrow, the sword, the gun, and other arabesque motifs. These are found in both the interior and exterior of the places. Decorative elements found only on the

exterior are the *zanko* and the *indararo*. Some palaces would have ornaments unique to their emirates, these are the national symbols of those emirates. Garba (2023) stated that the unique symbol for the Bauchi emirate is the talking drum. Likewise, that of the Gombe emirate is the cow and a snake for the Daura emirate (Figure 33).



Figure 33. The snake symbol is used as an ornament in the Daura Palace (Samuel, 2022).

A palace example that incorporates all these features is the Gidan Rumfa (Kano Emir's palace), which was built by Muhammad Rumfa in the late 15th century and is possibly the oldest in Northern Nigeria (Figure 34).

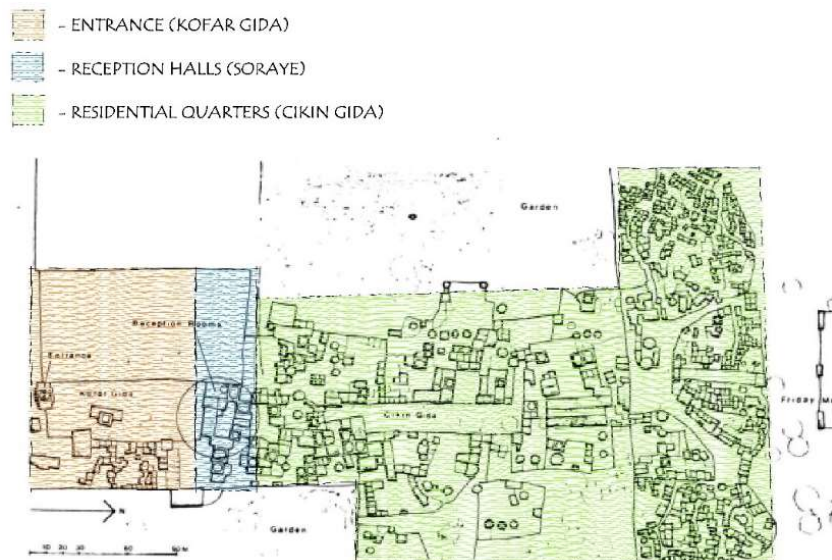


Figure 34. Gidan Rumfa Palace in Kano (Kahera, 1987).

The entire complex covers around 33 acres with the build section measuring 450 meters by 280 meters. The Palace was designed in earthen form and constructed by professional masons using Hausa traditional architecture (Umar, 2018). Figure 35 shows a section of the palace.



Figure 35. A section from the Kano palace
(Samuel, 2022).

The palatial residence houses the King's chambers, the meeting place of the Kano council, the royal stables, the residential quarters for the King's family and wives as well as workers' quarters (Samuel, 2022).

4.1 An Gaze Through Historic Palaces

In this research, historic palaces are described as those vernacular palaces that were built around the 15th century and that are still standing today. Another criterion for the selection of these palaces is the level of change that they have gone through. Preference has been given to palaces that have retained the original structure and building materials. Here, two palaces were selected; the Emir's Palace in Bauchi, Bauchi state, and the Emir's Palace in Hadejia, Jigawa state. Visual assessment of the palaces was carried out where the pictures were taken and sketches were done

when necessary. The assessment and analysis carried out used the features of VAAN as variables. Additionally, interviews were done with representatives of history and documentation was done at each palace. The selection of interviewees was purposive as it had to be a person that had been in the palace for a long time and they had to have a broad knowledge of the palace's history and building. In Bauchi, Ado dan Rimi Garba, head of research, history, and documentation was chosen. He is an urban and regional planner which makes him versed in the knowledge of building. In Hadejia, Ismaila A Sabo was chosen. He is also the head of research, history, and documentation of the Emirate and has a vast knowledge of the palace building. Documentation of the case studies and the interview answers are analyzed below and this will further aid in the list of the design recommendations. In places where accessibility was restricted, images are gotten from secondary sources.

4.1.1 Evaluation of Bauchi Emir's Palace. Bauchi, located in the northeastern part of Nigeria, was founded in the 1800s by Yakubu I dan Dadi, one of Usman dan Fodio's commanders (H. A. S. Johnston, 1967). He conquered a savanna region with sparse vegetation and built the town's walls which measured around 10.5km. Under his administration, the emirate was established in 1809, and the palace that serves as its administrative center was constructed in the same year. Bauchi had 10 emirs asides from him, and after more than a century it became a state in 1976 (Samuel Isaiah, 2018). Bauchi state is known for the traditional activities of farming and agriculture, tanning, and blacksmithing. The climate is a tropical savanna with the highest temperatures reaching 40°C and has an annual precipitation of 86mm in rainfall (Isaiah, 2018).



Figure 36. Palace of the Emir of Bauchi

(Author's archive, 2023).

The palace complex was built in 1809 (Figure 36). Most of the palace is transformed in time but some parts of it are still keeping their originality. It has three main parts; the entrance, the reception halls, and the residential quarters as seen in the layout in Figure 37. This can be classified as public, semi-public, and private respectively. Upon entering the palace's massive walls, one is greeted by the *Dogarai* or king's guards every step of the way, to access any part from there one needs permission.

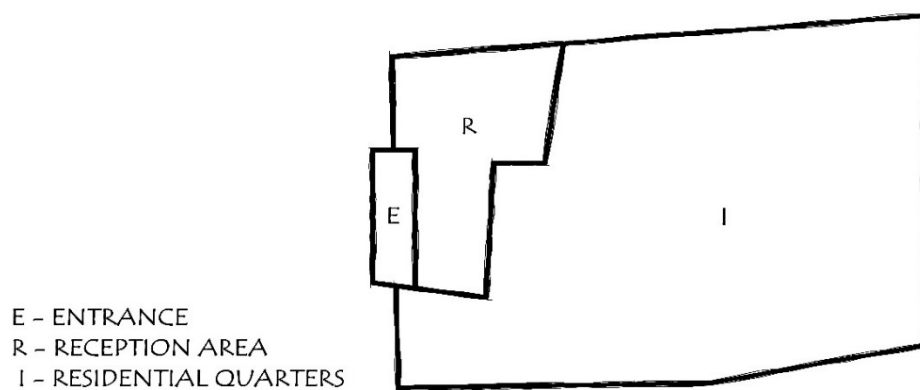


Figure 37. The layout of the Emir's Palace in Bauchi

(Drawn by Author).

The entrance opens up to the several reception halls or *soraye* of the palace and the entrance to the innermost sections. The entrance to the innermost sections is protected by several guards and one has to go through them and several buffer spaces to reach the residential quarters or *cikin gida*. The residential quarters is further divided into the King's residence and residences for his family, wives, and children. There used to be seven reception halls in the Bauchi palace; namely Soron Dikko, Soron Tambari, Soron Babban Gwani, Soron Makaranta, Soron Dinki, Soron Yashi, and Soron Fadanci, all built in 1858. The soron makaranta, Soron Dinki, Soron Yashi, and Soron Fadanci were demolished in 1923 for expansion purposes to be replaced by the palace walls and more open space (interview with Garba, 2023). Garba 2023 says the Soron Tamabari was later demolished because it was obstructing the flow to the residential quarters. Even though most of the reception halls have been demolished to be rebuilt and replaced with other functions, the oldest one standing was built in 1858 (Figure 38). That is the Soron Babban Gwani named after the architect that built it (Garba, 2023).

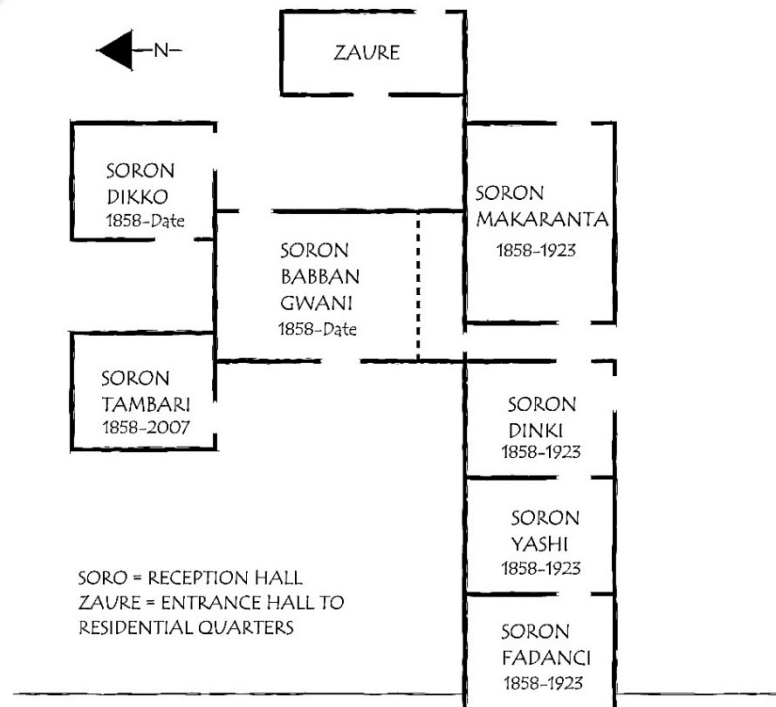


Figure 38. The reception halls in Bauchi Palace

(Drawn by Author).

This is the King's chamber where he receives guests, other emirs, and government officials. This is a semi-public zone in the palace as only allowed guests can go in. This reception hall is one of the best examples of VANN. It comprises the reception area and a close courtyard on the side where the king goes to take rests in between meetings. It also has a separate entrance at the rear that is connected to the residential quarters and is only used by the king. Figure 39 shows the interior view of the hall where the king sits and Figure 40 shows the front of the courtyard where the king goes to take rest.





Figure 39 & Figure 40. Interiors of the Babban Gwani hall
(Author's Archive, 2023).

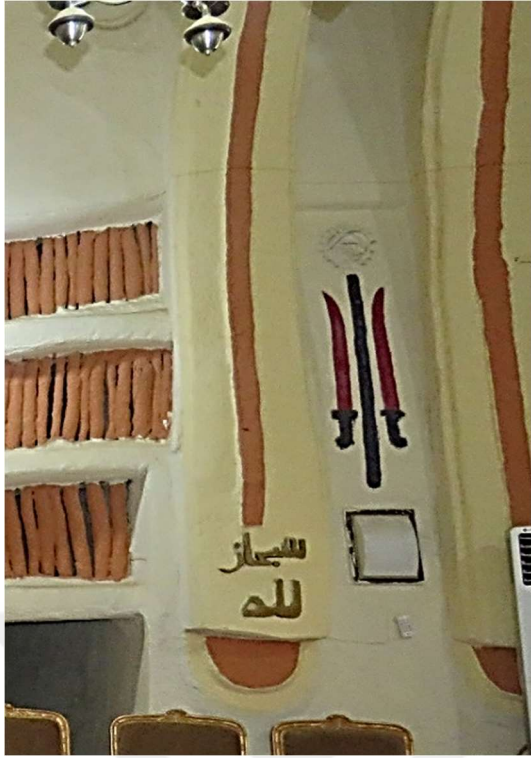
The main building materials used for the residential quarters and the Babban Gwani hall are mud, *azara* timber, stone, and grass, but the entrance and the new reception halls were built with modern materials like cement, sandcrete blocks, and steel (Figure 41). Mud is mainly used in the entirety of the construction. It is used for making mud bricks that are used for making the walls and also used as mortar when laying the bricks in place. The bricks are made in a pear shape called *tubali* before they are burnt to dry them completely. Mud is mixed with grass to provide tensile strength, the mixture of the two is left to decay for about four days before use. The mixture is stomped with the feet till it gets to a sticky consistency which makes it ready for use. Timber is gotten from a palm tree called *giginya* and is used in the reinforcement of columns, arches, vaults, and roofs. Stone is used for the foundation and there is no excavation or foundation trenches. The stone is laid on the ground directly using mortar formed with a mixture of earth grass and water. When the roof is to be made, a mat made from doum palm fronds (*asabari*) is laid on top of the

trusses to form a membrane. Ash is then poured all over the mat to serve as a fire protector and also as a cooling agent for the interior. To bring out the shape of the roof, a mud mixture is poured and the outline is made using the hands. Plastering of the roof is done by applying the remains of dye pit (*katsin marina*) (Garba, 2023).



Figure 41. Exposed timber used in the construction of the palace
(Author's Archive, 2023).

Ornamentation is present in the interior and exterior of all the buildings of the palace, buildings are intricately decorated with ornaments depicting the culture of Bauchi emirate. Some of the recurring ornaments are the Arewa Knot, the talking drum, the spear, the bow and arrow, the sword of office, the gun, and some arabesque motifs. The Arewa knot is a symbol that denotes Northern Nigeria and the talking drum is the national symbol for Bauchi state, the bow and arrow, the sword of office, the spear, and the gun all represent the weapons used. Arabesque motifs were adopted from designs used in decorating the holy book of the Muslims, the Quran. In the exterior of these buildings, the famous *zanko* roof pinnacle and *indararo* roof gutter are used for decoration. Figures 42, 43, 44, and 45 show the various ornaments as seen in the Bauchi palace.



*Figure 42 & Figure 43. Sword and Flower design in the interior of the palace
(Author's Archive, 2023).*



*Figure 44. Talking drum, Gun, and bow and arrow design in the palace
(Author's Archive, 2023).*



Figure 45. Bow and arrow ornament in the Bauchi Palace
(Author's Archive, 2023).

Here, the façades even though simpler than the next example still include some ornaments of VANN. Another example to be mentioned here is Babban Gwani Palace. Figure 46 shows a breakdown of some ornaments on the façade of the reception hall. At the top of the Babban Gwani, a green crest is placed which was given to the state by the colonials (Figure 47).

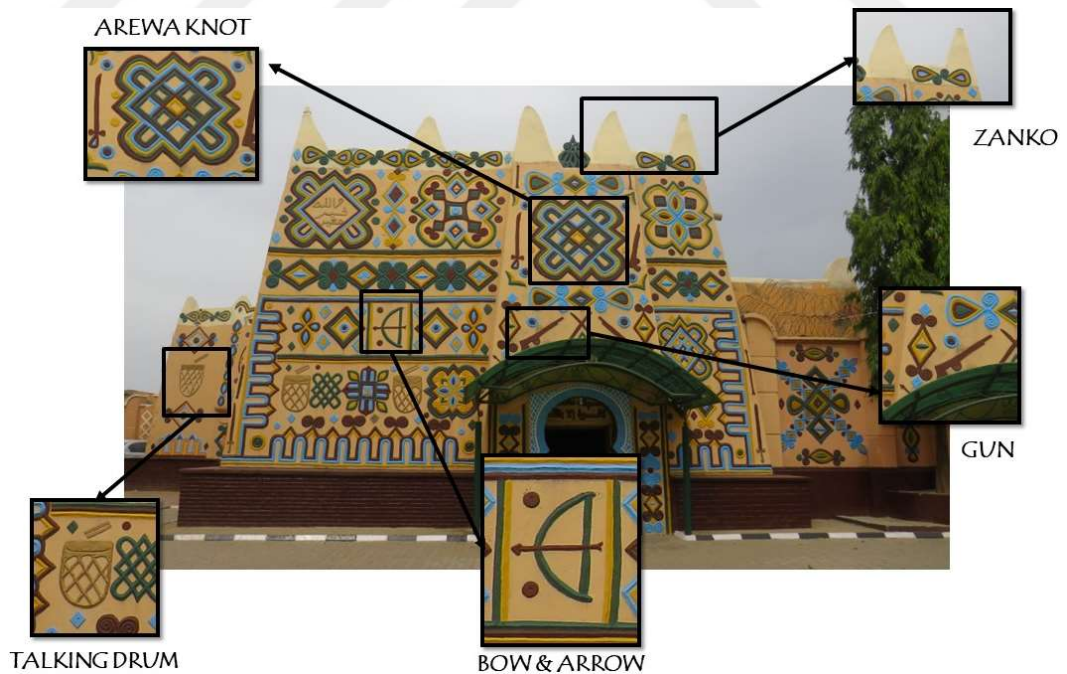


Figure 46. Ornamentation on the exterior of Babban Gwani reception hall
(Author's Archive, 2023).



Figure 47. Green crest ornament atop the Babban Gwani hall

(Author's Archive, 2023).

Across the palace, a variety in the ornaments of the façade is seen. The most façade is seen on the Babban Gwani hall which is where the Emir receives his guest. This could have been done to show this as the more significant building.

The structure of the older buildings in the palace has been retained. The Structure of the Babban Gwani is made-up of arches, vaults, and domes (Figure 48, 49 &50). The arch is made by connecting several *azara* using a grass rope (*igiyan kaba*) to make the frame. The frame is made by erecting *azara* pieces at each end of the arch and curving them at the desired height. This framework is patched with mud mortar to hold them in place. This process took a long time to dry hence making the construction of a building last up to two years. The columns and beams are connected in a curved pattern to form a web-like pattern called the *bakan gizo* vault. These were made with timber-reinforced mud where the timber is the tensile member while the mud is for compression.



Figure 48& 49. Ribbed vault and arch structural members in the palace
(Author's Archive, 2023).

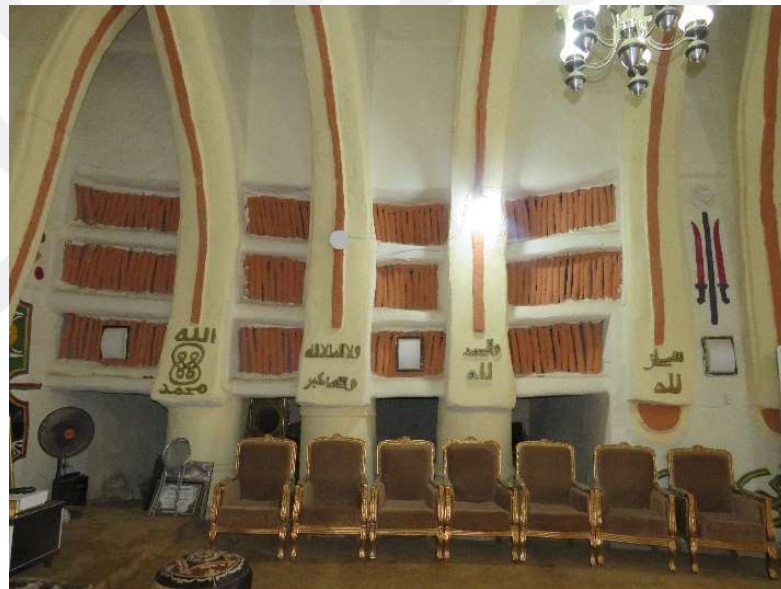


Figure 50. Timber-reinforced columns as seen in the interior of Babban Gwani
(Author's Archive, 2023).

The ribbed vault and round arches of the interiors of Bauchi palace are visibly one of the distinct features that are associated with the vernacular VANN structure.

According to the findings from the case study, this table analyzes the Bauchi Palace in terms of the features of VANN in the table below:

Table 1

Summary of Analysis of Bauchi Palace in Terms of Features of VANN

Feature of VANN	Bauchi Palace	Remarks
Spatial Organization	The palace complex is made up of 3 main parts; the entrance, the reception halls, and the residential quarters. The palace follows the spatial hierarchy of privacy having access restricted in stages of public, semi-public, and private spaces.	Visual privacy is achieved. This goes in line with this feature of VANN.
Building Materials	Mud, <i>Azara</i> , and Grass are the main building materials of the Babban Gwani palace and the residential quarters. Cement, sand-crete blocks, and steel are used in the new entrance building and new reception rooms.	VANN is portrayed in the Babban Gwani palace and the residential quarters.
Interior Ornamentation	The interior of the Babban Gwani is filled with ornaments of the Arewa knot, the sword of office, the talking drum, the bow and arrow, organic patterns, and other arabesque motifs.	Ornamentation is an integral part of interior design in VANN, and it is seen here
Exterior Ornamentation	The exterior of the Babban Gwani and the reception halls are intricately decorated with the Arewa knot, the sword of office, the talking drum, the bow and arrow, and other arabesque motifs made with cement and sand plaster. The <i>Zanko</i> and <i>indararo</i> are seen protruding at the corners of all the buildings in the palace, both old and new.	The zanko and other ornaments have been maintained in the new buildings even though it was made with modern materials.
Structure	The structure of the Babban Gwani is not changed. The vaults and arches that make up the dome are still the same.	Efforts have been made to retain the initial structure.

It is understood from the analysis of the examples that there are some attempts regarding VANN while designing the palaces. It is possible to claim that these attempts are important in the context of the preservation of the identity of the palaces in Bauchi.

While preserving heritage sites might be difficult, when it comes to the preservation of living heritage sites, the difficulty increases. Living heritage sites like palaces are evergrowing and everchanging, and without any guide to this, heritage may get lost. As a very important structure of VANN, palace preservation techniques should be passed down just as history is. The Emir, who is the most powerful person in the palace, is in charge of making any changes and establishing the guidelines for doing so, according to the interview with Garba (2023). He states that the present Emir of Bauchi doesn't allow any change that would alter the original structure of the palace. Even when part of the Babban Gwani reception hall fell, it was rebuilt with the same vernacular materials that it was built in. This was achieved by bringing in builders from the progeny of the original builder, Babban Gwani in Zaria, and these works are supervised by a palace official.

Garba (2023) says that preservation is costly and the biggest problem faced when it comes to the preservation of the palace is water leakage. It weakens the walls and makes them susceptible to falling. The solution found to prevent moisture from penetrating the walls is by burning wood (*gumagumai*) at the edges to dry up any moisture present. This process is done every year. For other repair work, painting is done every 3 to 5 years, when a big event is about to take place or when a new emir comes to power. Garba (2023) adds that in terms of building materials, traditional building materials (mud, grass, and azara) are retained in works concerning structure but for finishing, modern materials (cement and sand) are used. Finishing is done by hand to depict the traditional building way of doing so. Observation during the visual survey confirms the points made above.

4.1.2 Focusing on Hadejia Emir’s Palace. Hadejia, a town in the northwestern state of Jigawa was founded in 1808. The town is rich in terms of pastured land and rich soil. It is known for its river and other natural resources. Formerly known as Biram, one of the original Hausa states (Hausa bakwai), according to a mythical history of the Hausa kingdoms (Jigawa state government). Hadejia Emirate Palace was built under the rule of the third Fulani Emir Mallam Sambo in the year 1808 after he conquered the town and was appointed as the new emir. The building was constructed with traditional building materials (Interview with Ismaila A Sabo. 2023).

The palace was built in the layout that follows that of VANN; you are welcomed by the entrance areas where palace guards are always seated, then further down you are met by several traditional reception halls that lead to the residential quarters. Some of the reception halls are Soron Gadi, Soron Malamai, and Soron Koramai. A sketch of the layout is shown below (Figure 51).

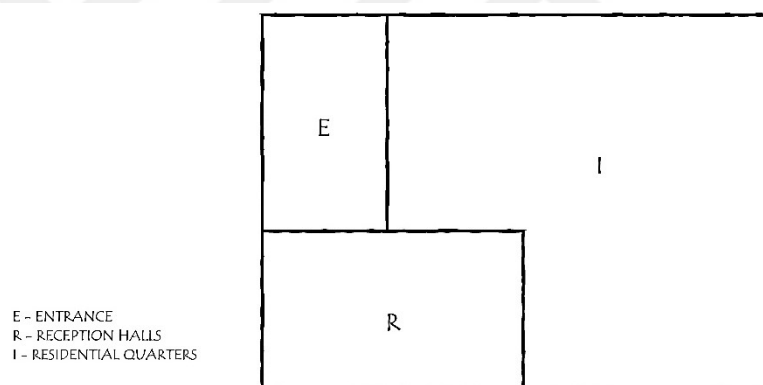


Figure 51. Layout of the Hadejia Palace

(Drawn by Author).

The main building materials used in the Hadejia palace are Mud, Timber, and grass, in some places, *makuba* is used. The mud is used in making the walls, the beams and columns, the roof, and all other structural components. The mud, (*tabo*) has to be selected from a source of good clayey soil. It is then mixed with grass, cow dung, and water and stomped with the feet or beat with a stick. The mixture is left to dry for a few days before mixing is done again to achieve desired stickiness. The mixture is used to mold *tubali* bricks used for wall making and as a binder for the

bricks and timber in places where they are used. Timber is gotten from the *giginya* palm tree to make azara beams used as a load-bearing member. This timber is chosen for its durability, strength, and ability to resist termite attack. Azara beams are used as lintels for doors and windows and as frames for columns, beams, arches, and roofs. The azara used in the Hadejia palace is had withstood the weight of the structure for over 200 years now.

The building process begins with the digging of the foundation trenches about 650mm deep and the laying of courses of stone is done to create a barrier between the building and the groundwater. After this, the floor is made to a thickness of 50mm. For the erection of load-bearing walls and columns, timber pieces are inserted from the foundation to make the formwork for the element. The pieces are connected with a strong fiber-like rope and the shape of the element is made on the framework using mud. For wall construction, courses of tubali are made starting at the bottom with a thickness of about 600mm which reduces as the wall gets higher. Figure 52 shows the section of the wall as it gets thinner from the top.

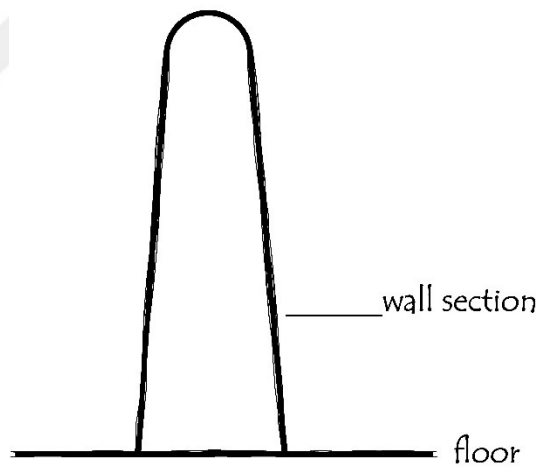


Figure 52 Section through a wall

(Drawn by Author).

At the top of the walls, the roofing members are placed to cover the entire surface of the interior. Due to the short span of azara (6 meters), corbels are made towards the top of walls to enable the achievement of a longer coverage (Figure 53).

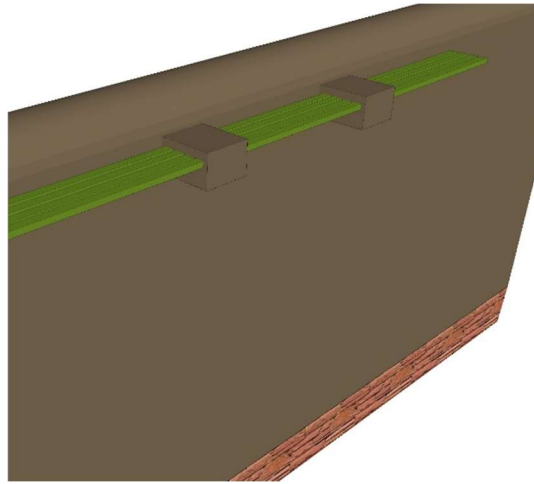


Figure 53. Use of Corbels to extend the coverage of azara

(Drawn by Author).

All over the interior walls and columns of the palace, ornamentation is used. These range from the Arewa knot, the swords, spears, guns, bows, and arrows to organic and arabesque patterns (Figure 54). The Hadejia emirate is symbolized by horses, hence horseshoe designs have also been used as ornaments in the interior (Figure 55).



Figure 54. Spear, bow and arrow, sword, and gun.

(Abubakar Maje, 2023).



Figure 55. Horseshoe design
(Abubakar Maje, 2023).

On the exterior walls, the Arewa knot is seen in different forms together with repetitive organic patterns in colorful forms. The *zanko* and *indararo* ornamental elements are also used. Figure 56 below shows the ornamentation on the exterior of the palace.

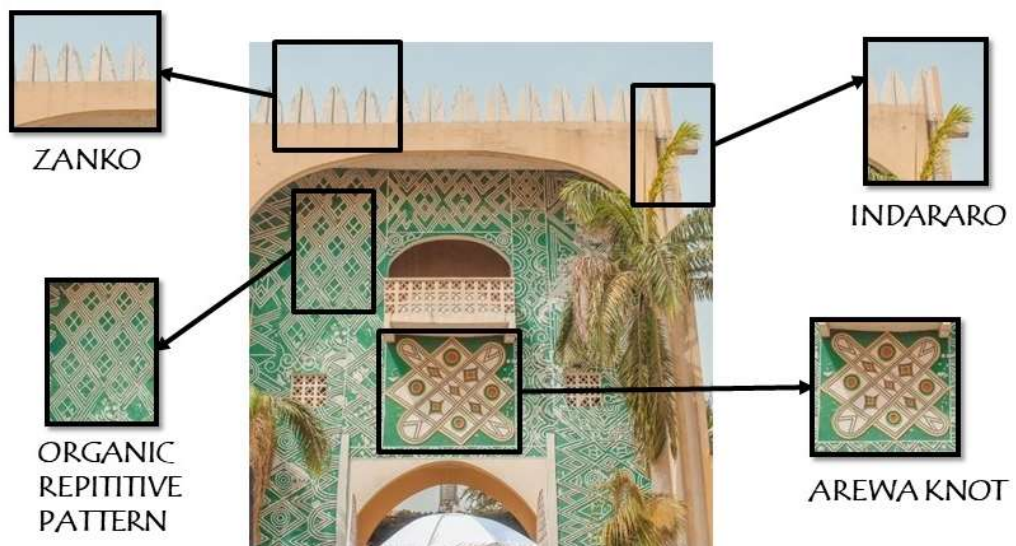


Figure 56. Exterior ornaments on the palace walls
(Maje, 2023).

The structure of the palace which has been unchanged for centuries is made up of the arches and vaults that make up the web design of the *Bakan gizo*. These are present in all of the reception halls of the palace. Figure 57 and 58 show the structure through interior views of the palace.



Figure 57 & Figure 58. Interior views showing the arches and vault (Maje, 2023).

According to the findings from the case study, this table analyzes the Hadejia Palace in terms of the features of VANN in the table below:

Table 2

Summary of Analysis of Hadejia Palace in Terms of Features of VANN

Feature of VANN	Hadejia Palace	Remarks
Spatial Organization	The palace complex is made up of 3 main parts; the entrance, the reception halls, and the residential quarters. The palace follows the spatial hierarchy of privacy having access restricted in stages of public, semi-public, and private spaces.	Visual privacy is achieved. This goes in line with this feature of VANN.
Building Materials	Mud, <i>Azara</i> , and Grass are the main building materials of the reception halls.	VANN is portrayed in the reception halls of the palace.
Interior Ornamentation	The interior of the reception halls is filled with ornaments of the Arewa knot, the sword of office, the talking drum, the bow and arrow, organic patterns, and other arabesque motifs. The symbol for Hadejia is a Horse. The horseshoe ornament is also seen in the interior.	Ornamentation is an integral part of interior design in VANN, and it is seen here
Exterior Ornamentation	On the exterior of the palace entrance, the horse ornament is used which is the symbol of the town. The arewa knot, the <i>zanko</i> , and <i>idararo</i> are seen on the several exterior walls of the palace.	Cultural symbolism is an important aspect of VANN.
Structure	The structure of the reception halls has not been changed. The vaults and arches that make up the domes are still the same.	Efforts have been made to retain the initial structure.

The analysis of the instances shows that there were attempts to include VANN in the palace designs. One could argue that these initiatives are crucial to preserving the distinctive personality of Hadejia's palaces.

Hadejia Palace is over 200 years old and the structure still stands because of the preservation efforts put in by the palace. According to the interview with Sabo (2023), (who is the head of history, research, and documentation of the Hadejia emirate), he states the passion that the palace has for being ardent in making sure not to abandon traditions especially when it comes to buildings. He adds that those that have adopted new building types will have nothing to show to others as their traditional buildings. He also agrees that change is inevitable especially when colonialization happened and has occurred in some parts of the palace through the use of modern finishing materials. Nevertheless, the palace makes efforts to preserve its traditional character. Maintenance work is carried out yearly on the palace building so it does not deteriorate. This is done for four weeks at the end of each year. This includes repair work and plastering where necessary. The repairs on structural parts are strictly done with traditional materials whereas, in the finishings, modern materials like cement are used. These works are guided by the head building official called the Sarkin magina to ensure efficiency is achieved.

4.1.3 Comparative analysis. After analyzing two selected examples; Bauchi Palace & Hadejia Palace a comparative analysis between them is made according to the visual surveys & the inquiries. The table below shows the analysis of the similarities and differences between these palaces. According to the visual surveys done and the inquiries answered on both palaces, it is understood that the palaces share lots of similarities in terms of VANN than differences.

Table 3

Comparative Analysis of Bauchi and Hadejia Palace in Terms of Features of VANN

Features	Bauchi Palace	Hadejia Palace	Remarks
Age	Was built in 1809 (214 years).	Was built in 1808 (215 years).	Same century
Spatial Organization	A spatial hierarchy that allows the division of spaces by privacy into Public, semi-public, and private		Privacy is provided
Building Materials	Mud (earth), timber, and grass as the main materials		Same building materials & construction techniques
Interior Ornamentation	Arewa knot, sword, gun, spear, bow, arrow & organic patterns as ornaments		Ornaments are similar but differ in symbols unique to the emirate.
Exterior Ornamentation	Talking drum as an ornament	Horseshoe design as an ornament	Similar but differ in elements unique to each emirate.
Structure	Use of timber-reinforced mud columns, round arches, and <i>Bakan Gizo</i> vault.		Similar.
Cultural Depiction	Use of traditional ornaments Privacy as the rule of planning		Similar.
Preservation	Keeping the old structure of the palace Spatial rules regarding privacy Use of traditional materials		Similar.

The first two case studies, Bauchi and Hadejia Palace have been built in the same century and share a lot of features. From the building materials and layout to the

structural members. Even with so many similarities, each palace also stands out with unique features that are distinct to that emirate which proves that VANN can be an integral part of the portrayal of the identities of palaces. The cultural depiction is done in VANN buildings by having the buildings tell stories about the culture of a people, for example, in the use of some cultural motifs as ornaments and the layout of spaces according to the Hausa people's culture. The next section talks about their opposites, the newly constructed palaces, together with the differences and similarities they share with the historic palaces.

4.2 Reading of Newly Constructed Palaces

Change as we know is inevitable, especially in a fast-growing industry like the building industry. When globalization and modernization occur, their effects brought about many changes. In the building industry, it brought about the accessibility of building materials and techniques that made construction and maintenance easier. These new materials were chosen over the more weathering earth that was primarily employed in Nigeria due to the permanence they came with them. These materials also provided ease of maintenance as traditional buildings required yearly upkeep (Garba, 2023). Palace buildings are an excellent example of buildings where tradition should be preserved. Some palaces however have chosen modern materials to replace the traditional materials that were once used. Some historic palaces were entirely replaced with modern materials and in cases of more recent palaces, they were built initially with modern materials. For this research, both examples are considered and an example of each has been chosen. The Gombe Emir's palace and the Sokoto Emir's palace have been chosen. The Gombe Palace was built in 1920 and was demolished to be replaced with a modern structure in 1985. The Sokoto Palace was built in 181 but was replaced with a modern structure in 1980.

The Visual assessment of the palaces was carried out where the pictures were taken and sketches were done when necessary. The assessment and analysis carried out used the features of VAAN as variables. Additionally, interviews were done with representatives of history and documentation was done at each palace. The selection

of interviewees was purposive as it had to be a person that had been in the palace for a long time and they had to have a broad knowledge of the palace's history and building. In Gombe, Ahmad Abubakar, a head palace official was chosen. He has lived the tenure of three Emirs in Gombe and has great knowledge of building and history. In Sokoto, Aminu Muhammad was chosen. He is one of the historians of the emirate and has a vast knowledge of the palace building. Documentation of the case studies and the interview answers are analyzed below and this will further aid in the list of design recommendations. In places where accessibility was restricted, images are gotten from secondary sources.

4.2.1 Analysing Gombe Emir's Palace. Gombe state, the Jewel in the Savannah, is located in the northeastern part of Nigeria. Since the national railroad's completion in 1963, Gombe town has become a significant collector of cotton and peanuts, as well as a regional trading hub for grains (cowpeas, sorghum, millet), tubers like cassava, onions, beans, and tobacco (Britannica, 2019).

A follower of Usman Dan Fodio named Buba Yero founded the emirate in 1804 (Ahmad Abubakar, 2023). The headquarters of the emirate used to be based in Gombe Abba in Dukku LGA of Gombe state. In 1914, it was moved to Nafada where it stayed for six years under the tenure of Emir Umaru dan Muhammadu. Then the emirate moved to its present location in Gombe Doma which was a deserted and empty location (Abubakar, 2023). Historically, the only town at the time in Gombe Doma was Kurba and the size of the town was measured to be used as the size of the palace building. The palace was built in 1920 by the British colonial with the help of local masons (*Maginan Gombe*). This palace was later demolished in 1985 by Emir Shehu Usman Abubakar to be rebuilt. According to the interview with Abubakar (2023), up until now, the rebuilding has not been completed. The new Gombe palace is shown in Figure 59 below.



Figure 59. The main entrance of the Gombe palace
(Author's Archive, 2023).

The initial palace was a large complex that consisted of reception halls, residential quarters for the king, and his family, and accommodation for some palace officials. The palace consisted of neighborhoods where these accommodations were. The palace hosted about 15 palace officials. From the outside, the palace was surrounded by houses of palace officials; behind was that of the Makama, to the right, was Turakin Soro and Gidan Ajiya, and on the left were Gidan Dawaki and Gidan Santali. The layout of the palace remained like this after the death of Emir Umaru and the death of his successor Haruna 17 years later. No change was made to the palace during both tenures. It was when Emir Abu Bakar dan Umaru came into power in 1936 that change started happening in the palace. During that time the palace began to accommodate guests of the king inside the palace. Due to a shortage of accommodation, the king moved out some palace officials to make new buildings that served for keeping guests. These guests were Emirs of other Emirates and other guests of the king. The layout remained like this till he was succeeded by Emir Shehu Usman Abubakar in 1984. He came into power when it was a time of modernization and globalization. He was a well-traveled civil engineer who took inspiration from his international travels and adopted elements in the design of his palace. He incorporated these elements with those of VANN to completely rebuild

the Gombe palace. In 1985, the entire palace was demolished to be replaced with a new one made with modern materials and technologies. The rest of the palace officials were moved out of the palace to make space for the new buildings. Even the residential quarters were built to keep up with the modernization of the other parts of the palace. Not all of his plans came to reality before his death in 2014 (Abubakar, 2023) (Figure 60 & 61).



Figure 60 & Figure 61. Uncompleted parts of the Gombe Palace
(Author's Archive, 2023).

The new palace now retains the original layout as seen in Figure 62. It consists of an entrance area, reception halls, and residential quarters. Abubakar (2023) claims that the identity of the palace is unchanged since the layout and form was kept with only change in the building materials.

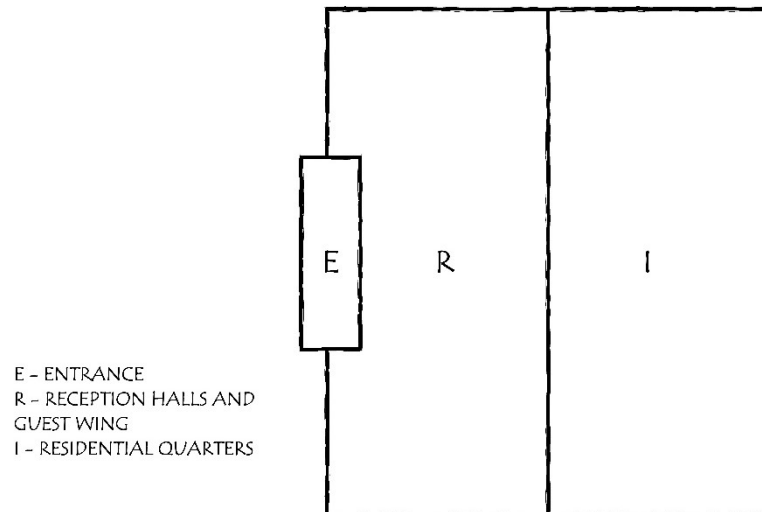


Figure 62. The layout of the present Gombe Palace

(Drawn by Author).

The palace's gate opens up to a huge open space at the center with reception halls on both sides. The open space is used for palace events like the biannual durbar that is hosted by the king (Figure 63). At the entrance, one is met with palace guards whose permission needs to be taken before further entry. The reception hall on the right is the King's main chamber and one needs special permission to go in. Looking straightforward one gazes upon an entryway that leads to the residential quarters (Figure 64). This entryway is connected to a long corridor that connects to the living quarters of the wives and children of the king. The corridor serves as a buffer space and creates visual privacy before reaching the residents (Figure 65). Servant quarters are also located there. All these have been built with modern materials.



Figure 63. The open space that leads to the reception halls and residential quarters
(Author's Archive, 2023).



Figure 64 & Figure 65. The entryway to the residential quarters and the corridor
(Author's Archive, 2023).

Observations show that the facades in this palace are plain and lack any form of ornamental features compared to the historic palaces. The facades here seem to be plain in their design and choice of colors. The façade of the residential quarters, however, provides an inconsistent architectural language (Figure 66). The openings are bigger and this makes the privacy component here debatable. The presence of bigger windows here does not go in line with the privacy required for residential quarters.



Figure 66. Exterior view of the residential quarters

(Author's Archive, 2023).

The main building materials for the palace are cement, sand, and steel. Here the cement and sand mixture replaces the mud for making blocks and is used for mortar. The steel substitutes the tensile strength and the longevity of the azara timber. The availability of these materials has brought about the means for some construction possibilities. Double stories were achieved and construction was done a lot faster. It brought about the construction of walls that were strong enough to have wide openings which was not the case in the vernacular buildings. Finishes are done with cement-sand plaster and the walls are then painted mostly in cream and brown color.

The interior of the main reception hall is ornamented in surface patterns similar to those seen in the historical palaces. These patterns follow a repetition of straight and curved lines. These patterns are only present on the accent wall behind the king's throne. It also includes a large ornament made from the state's national symbol at the center of the wall (Figure 67).



Figure 67. Interior ornamentation at the gombe palace main reception hall
(Author's Archive, 2023).

King's main reception hall is a big space with a red rug & whiteish walls. There are no ornaments on the walls except one that is behind the king's throne. There are two sitting units which are different than each other. The first group of sitting units is next to the king's seat. They have golden look ornaments on them and they also look much more expensive than the others. These seats are for the higher-ranking palace officials. The second group, which consists of red armchairs sits the other palace officials and the guests of the king. They are on the other side of the wall. All of the seats are aligned by the walls and the only focal point is the seating part of the king. More views of the interior are shown in Figure 68 and 69 below.



Figure 68. Right view of the King's main reception hall
(Author's Archive., 2023).



Figure 69. Approach view of the King's main reception hall
(Author's Archive).

When one first looks at the palace's exterior, one might not notice any characteristics of VANN, but with closer inspection, they become apparent. According to the interview with Abubakar (2023), the palace design incorporated

VANN features in a modern style. The *zanko*/ roof pinnacle is seen on the top of all buildings in the palace (Figure 70). The roof gutter (*indararo*) that is used as a design element has also been reinterpreted here (Figure 71).



Figure 70. Zanko/ roof pinnacle ornament in Gombe Palace
(Author's Archive, 2023).



Figure 71. Indararo/ roof gutters in Gombe palace
(Author's Archive, 2023).

The round arches and archways give reference to the vernacular ones seen in the Bauchi palace, Even though, those in the old palace are lower. Figure 72 shows the arches as seen in the Gombe palace.



Figure 72. Round archway in the Gombe palace
(Author's Archive).

The structure of this palace is made with different techniques and materials than the old ones. It however constitutes elements like the round arch similar to those in the historic palaces.

According to the findings from the case study, this table analyzes the Gombe Palace in terms of the features of VANN in the table below:

Table 4

Summary of Analysis of Gombe Palace in Terms of Features of VANN

Feature of VANN	Gombe Palace	Remarks
Spatial Organization	The palace complex is made up of 3 main parts; the entrance, the reception halls, and the residential quarters. The palace follows the spatial hierarchy of privacy having access restricted in stages of public, semi-public, and private spaces.	Visual privacy is achieved. This goes in line with this feature of VANN.
Building Materials	Throughout the palace, modern materials are used; cement, sand-crete blocks, and steel.	VANN is not portrayed.
Interior Ornamentation	Ornamentation is seen on only the accent wall of the main reception hall. The interior is ornamented with the national symbol of the state which is the cow and repetitive patterns of lines and curves.	Ornamentation is an integral part of interior design in VANN, and it is partially seen here.
Exterior Ornamentation	The exterior of the palace is made with cement and sand plaster. The <i>Zanko</i> is seen protruding at the corners of all the buildings in the palace, the <i>indararo</i> also has been incorporated here.	The <i>zanko</i> and <i>indararo</i> have been maintained in the new buildings even though it was made with modern materials. The other intricate ornaments that are commonly seen on the exterior of VANN buildings are absent here.
Structure	Even though the ribbed vault (<i>Bakan Gizo</i>) is absent here, some round arches and archways are seen in the palace.	The round arches seem to pay homage to VANN.

The analysis of the instances shows that there have not been enough attempts to include VANN in the palace designs. The palace only shares a few similarities with the historic palaces; like the building layout that shows the hierarchy of spaces. The differences however are many, like in the use of different building materials and techniques. The plain facades also give off a different architectural language. More about the similarities and differences are discussed later on in Table 6.

Preservation here is in terms of what was retained from the traditional way of building. As stated by Abubakar (2023), no one wants to replace tradition entirely. However, there is no guide for the preservation of palace identity; once you are king any change you decide to make it's within your right. Abubakar (2023) also believes that it is necessary to keep up with modernity so you don't get left behind. Hence the palace was rebuilt entirely with modern materials and techniques. However, some features of VANN have been retained in the new palace building. In Gombe Palace, no change was made to the initial layout of the palace. The layout spatial hierarchy in a VANN palace has been mentioned to be one of the important features. The layout maintains the concept of privacy by having public, semipublic, and private spaces. The interior spaces have retained some elements of ornamentation. On the exterior, there has been adaptations to a few ornamental features. Conversely, in some ways, preservation is lacking. The palace was built with no traditional building materials. The signature intricately ornamented facade attributed to palaces is absent here. This and other aspects of the palace building deviate from the preservation of the historical building identity that is required for palaces.

4.2.2 Examining Sokoto Emir's Palace. Sokoto emirate also known as Sokoto caliphate was founded by Usman dan Fodio In 1804. It is located in present-day Sokoto state in the northwestern part of Nigeria. The emir, also Sultan of Sokoto holds the title of Amirul Mu'minin which is the head of all the Muslims of Nigeria. The palace was built in 1817 by Mohammed Bello son of the founder to serve as the residence of the sultan. It was completely demolished in 1980 to be revealed in a more than character. It was not changed in layout or form but in terms of building materials.

As the palace of the head of the Muslims in Nigeria, Islam has shaped the layout and design of this palace. The palace maintains a layout the just like the three other palaces discussed above. The organization of spaces follows a pattern that promotes privacy from a region of low privacy through to a region with the highest privacy (Figure 73).

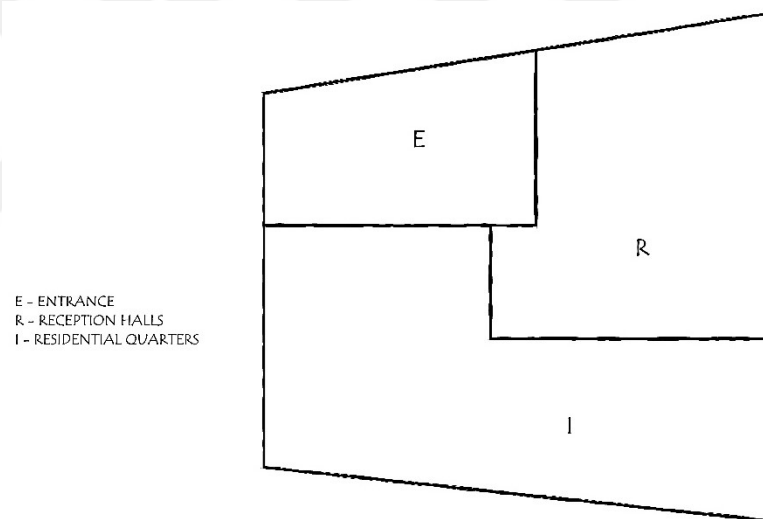


Figure 73. Layout of Sokoto Palace

(Drawn by Author).

The palace entrance is a large white and green tower with the green representing the color of the flag of the Emirate (Figure 74). It is used as a beacon as its height makes it visible from places further distances. The palace entrance leads you through a garden to get to a waiting room that connects to different reception halls. These reception halls all serve different uses and host different classes of guests. The first

and biggest hall is used to host the president and people of similar standing. The second hall hosts kings of other Emirates, deputy governors, and ambassadors. The third hall is used by the king to hold daily council meetings like the settling of disputes.



Figure 74. The Sokoto Palace entrance gate
(Author's Archive, 2023).

The initial palace was built mainly with traditional materials, whereas the new building was made entirely with modern building materials like cement, sand, and steel. The new palace building was contracted to and built by Julius Berger, a construction company (Interview with Aminu Muhammad, 2023). Muhammad (2023) says that the building layout and form were retained and changes were only made in the use of modern building materials.

The palace is sparsely ornamented in the interiors and exteriors. It has on its wall a sword and a bag containing the Quran hanging in the reception hall. Figure 75 and 76 show the interior views of one of the reception halls of the palace.



Figure 75. Interior view of one of the reception halls of the Sokoto Palace
(Author's Archive).



Figure 76. Another interior view of the Sokoto Palace reception hall
(Author's Archive).

The exterior is ornamented in zanko and indararo as shown in Figure 77 below.



Figure 77. Exterior ornaments in Sokoto Palace

(Author's Archive).

The image shows some features that have been retained from VANN like the round arch design. The round arch design common in VANN is incorporated here in the window design and the exterior of the palaces. This is made with steel-reinforced concrete. The palace, however, façade lacks the ornamental motifs that are distinct to vernacular Hausa palaces. The façade showcases a plain exterior, unlike the historic palaces. The similarities with historic palaces are present, however, the differences are more. Table 5 below shows an analysis of the Sokoto Palace based on the features of VANN.

Table 5

Summary of Analysis of Sokoto Palace in Terms of Features of VANN

Feature of VANN	Sokoto Palace	Remarks
Spatial Organization	The palace complex is made up of 3 main parts; the entrance, the reception halls, and the residential quarters. The palace follows the spatial hierarchy of privacy having access restricted in stages of public, semi-public, and private spaces.	Visual privacy is achieved. This goes in line with this feature of VANN.
Building Materials	Throughout the palace, modern materials are used; cement, sand-crete blocks, and steel.	VANN is not portrayed.
Ornamentation (Interior)	Ornamentation is not seen engraved on the walls. A sword and a bag containing the Quran are hung on the walls.	Ornamentation is an integral part of interior design in VANN, and it is not seen here.
Ornamentation (Exterior)	The exterior of the palace is made with cement and sand plaster. The <i>Zanko</i> is seen protruding at the corners of all the buildings in the palace, the <i>indararo</i> also has been incorporated here	The new structures have kept the <i>zanko</i> and <i>indararo</i> even though they were constructed using modern materials. There are no other intricate decorations on this building like there are on the exteriors of VANN buildings.
Structure	Even though the ribbed vault (<i>Bakan Gizo</i>) is absent here, some concrete round arches and archways are seen in the palace.	The round arches seem to pay homage to VANN.

The table shows the Sokoto palace in terms of the features of VANN which have been used as the variable for this research. It studies the palace building in accordance with these features and it shows that the new palace building has a bit of similarity to historic palaces when one looks deeper. It is seen in the presence of the *zanko* and the *indararo* at the tops of the buildings. However, the preservation of the palace's identity is crucial to this research and it may not have been upheld here.

According to Muhammad (2023), the palace has retained its identity by not changing the form and layout even though the building materials were changed. He added that the palace looks more beautiful and modern now through the use of technological advancement. When the initial traditional palace was knocked down, it was replaced with one built with modern materials. The new palace retains the layout of the old palace. Elements of ornamentation of VANN are sparsely found around the palace. When it comes to VANN, the palace has a contrast, though, in both the construction and the building materials. Some aspects necessary for the identification of VANN may be absent here.

4.3 A Comparison Between Historic and Newly Constructed Palaces

This study aims to create a recommendation list for the preservation of old palaces and the design of new ones in accordance with VANN. That would not be possible without knowing what was in the historic palaces, what they are made of, what they stand for, and also the changes that happened to make way for the newly constructed ones. The studies above show that some of the palaces have stood the test of time and modernization whereas in the cases of others, complete replacement was done. It also analyses the differences between the palaces. Table 6 below summarises a comparison of the similarities and differences between the historic and the newly constructed palaces.

Table 6

Comparative Analysis of Historic and Newly Constructed Palaces in Terms of Features of VANN

Features	Historic Palaces	New Palaces	Remarks
Spatial Organization	A spatial hierarchy that allows the division of spaces by privacy; Public, semi-public, and private.		An important feature of the organization of spaces in VANN is the provision of privacy. It has been retained in both.
Building Materials	Mud (earth), timber, grass.	Cement, sand, and steel.	New palaces were constructed with modern materials.
Interior Ornamentation	Use of Arewa knot, sword, gun, spear, bow and arrow, organic patterns, and other significant symbols as ornaments.	Use of significant symbols.	Sparse use of ornaments in the new palaces compared to historic palaces.
Exterior Ornamentation	Use of ornaments listed above together with <i>zanko</i> and <i>indararo</i> .	Use of <i>zanko</i> and <i>indararo</i> .	Sparse use of ornaments in the new palaces compared to historic palaces.
Finishes	With cement sand plaster and paint.		Similar
Structure	Use of timber-reinforced mud columns, round arches, and <i>Bakan Gizo</i> vault.	Use of Steel-reinforced concrete columns, round arches, and beams.	Modern materials were used in new palaces.
Cultural Depiction	Shown in the ornamentation and planning of the palace.	Slightly shown in the ornamentation and planning of the palace.	Slightly similar
Preservation	Keeping the old structure of the palace and having rules in the planning scheme. Use of traditional materials in maintenance works.	Traditional buildings were demolished to be replaced by modern buildings.	Losing the cultural & architectural heritage.

The analysis from the table above shows the similarities and differences between the historic and the newly built palaces. It can be said that the differences outweigh the similarities in the sense that these new palaces have little or no link to VANN. Both new palaces have been assessed to be built with different building materials and techniques and this takes them far from the authenticity of Vernacular Hausa palace buildings. The scarce use of ornamentation has also hindered the cultural depiction of these palaces alongside other concerns. Altogether, these have made the preservation of heritage and identity in these palaces falter. This is due to a lack of preservation and an absence of a guideline that aids in upholding the vernacular characteristics of the previous palaces. The next section gives a list of recommendations for this.



Chapter 5

Architectural Suggestions for the Potential New Palaces

It is worthy of being repeated that palaces are significant architectural structures in Hausa architecture. They, being of immense history and culture should be preserved in tradition and building. If intangible aspects of heritage are passed down from generation to generation, so should the tangible aspects. As the most encompassing examples of the Vernacular Architecture of Northern Nigeria – VANN-, the palaces should be preserved, their architecture should be passed on and their identities retained. As gathered from previous research and case studies, there are a number of factors that are hindering the preservation of the heritage and identity of palaces. Some of these factors are the influx of more permanent building materials into modernization, the expenses attached to the preservation, the lack of skilled labor, and the absence of a guide that protects the modification of the palace. In addition, the knowledge needed to be known to understand the need for preservation may be limited.

The limitation faced in getting resources was inaccessibility to some parts of the palace. Hence, some information was written down based on what was gotten from the interviewees. Also where accessibility was restricted, pictures were used from secondary sources.

In this light, this research does create a recommendation to designers, architects, stakeholders, researchers, and the Emirates. This list of recommendations is made to guide the design of new palaces. This section provides a recommendation for the design and preservation of VANN palaces based on research done, interview answers, and case studies carried out.

1. Building layout – Though a palace is an extended kind of a dwelling unit, it still retains the layout that prioritizes segregation. Here it is, segregation of the spaces; privacy of the king to people without permission, and privacy of his family from outsiders. This layout has been visible in all Hausa palaces of case studies and all around northern Nigeria. This layout should be retained in old palaces and referenced in new designs. Figure 78 below shows a sample layout of a palace.

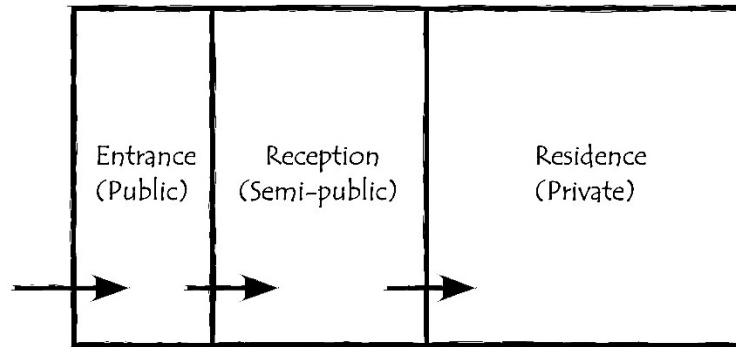


Figure 78. Layout of a palace

(Drawn by Author).

2. Building materials - Building materials are an integral part of what has shaped VANN into what it is today. The availability of local materials and the nature of those materials have determined the possibilities achieved in VANN. The use of these materials not only depicts the architecture of northern Nigeria but also the heritage that has been attached to it.
 - a) Mud is the most used and most available material in this architecture hence a building should poses this material in its construction. Mud is being used for construction as it is easily available, cheap, and provides thermal comfort to buildings. The shortcomings attached to the use of mud is its ease of weathering which leaves buildings vulnerable to collapse. With the aid of modern technology and resources, it is possible to find a solution to this problem through research on understanding its nature. For brickmaking, a probable and more durable alternative is through the use of modern-day mud bricks or adobe. These are made from a mixture of mud, grass, sand, and additives that make is more durable. These are sun or kiln-dried to remove moisture. They can even be shaped in a form to replicate the tubali of the Hausa architecture. Figure 79 shows Adobe bricks used in construction.



Figure 79. Adobe bricks in a house in Liberia
(Gbatu & Li, 2019).

- b) Azara – Azara timber is gotten from the Daleb palm or giginya tree which grows across northern Nigeria. It is preferred to others for its durability and ability to resist termite attacks. It is processed and used as reinforcement and for carrying loads in buildings. Its shortcoming is the short span (maximum of 6 meters) to which it is processed which may be due to lack of technological advancements at that time. Azara can very much be used today in the building of palaces as the raw material is available. And it is believed that with the advances of technology today, timber is being processed better and it is possible to extend the span of a length of azara to match desired needs.
3. Ornamentation – Ornaments in general have been perceived as one of the most distinctive features of VANN and this should be in every palace. Ornaments have been used to tell stories, show cultural identity, and portray power by the showcase of weapons. Even though these may differ by palace due to the uniqueness of each emirate, they are some that have resemblances seen in most palaces. These are seen in the interiors and exteriors of the palaces. These are the Dagin Arewa (the Arewa knot is the national symbol for the Northern part of Nigeria), weapons, Arabic calligraphy, and other organic patterns. What differs

by from palace to palace is what is unique to their story, the town they reside in, and the emirate. Some of these ornaments are shown in Figure 80 and 81 below.

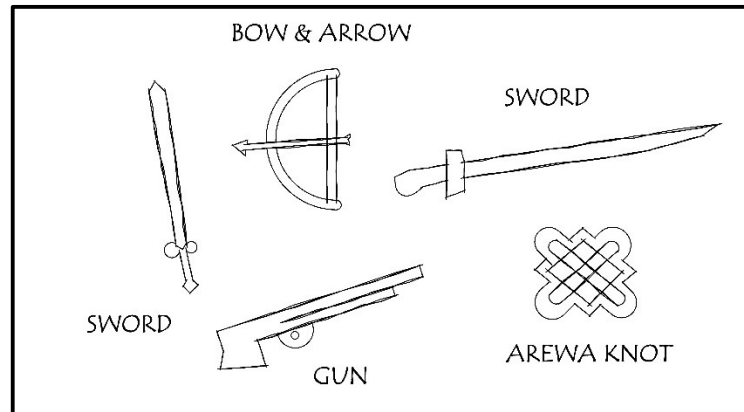


Figure 80. Recurring ornaments found in Hausa Palaces

(Drawn by Author).

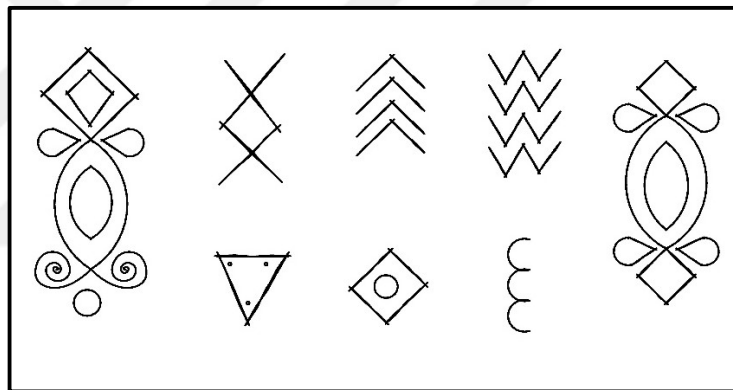
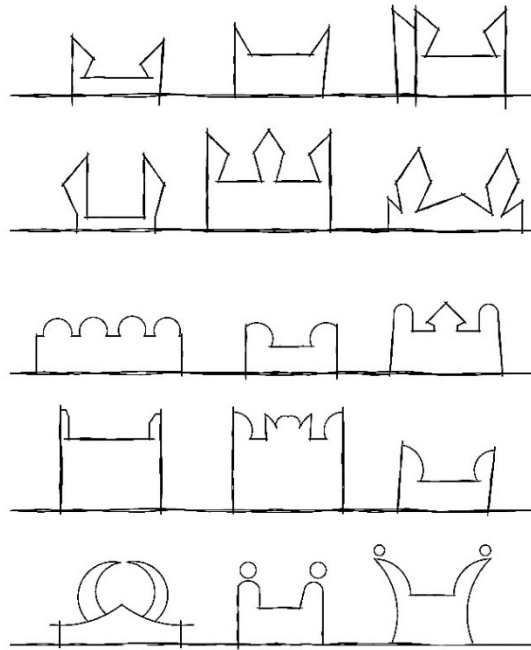


Figure 81. Ornaments found in both the interior and exterior of palaces

(Kahera, 1987).

The difference in the exterior is the presence of the zanko and indararo which define the façade of a palace. The zanko represents a VANN structure and should be used in the design of a palace. The zanko roof pinnacle is interpreted in many ways and some variations are shown in Figure 82.



*Figure 82. Different interpretations of Zanko roof pinnacle
(Kahera, 1987).*

These ornaments should be found in both of the palaces' interiors and exteriors. In addition to these, emirates could include ornaments that represent the symbols of their towns, history, and emirates.

4. Structure – Structure is inevitably what makes a building stand. Hausa masons have developed the structure of their buildings to serve their needs at times and those solutions are practical today. Vaults are used to hold domes that express the grandeur of the palace building. The special Bakan Gizo vault used in Hausa architecture is an element that should be retained in the design of palaces. This was constructed using crude techniques that could be improved today with the aid of modern technology. Figure 83 shows the Bakan Gizo Hausa vault. It is also important to retain the round arch design that is seen all around the palaces in Northern Nigeria. A round archway is shown in Figure 84.



Figure 83. The Bakan Gizo vault
(Kahera, 1987).



Figure 84. Round arch
(Author's Archive, 2023).

5. Finishes – For finishes, the suggestion is to use a red-brownish color to depict the *makuba* finish traditionally used in VANN buildings. The *makuba* gives off a rich red color when exposed to water.

A summary of the design suggestions is listed below;

- The layout of a palace should be in a hierarchy that goes from the entrance, reception area to residential quarters. This achieves the segregation of spaces into public, semi-public, and private.
- Traditional materials like mud and azara timber can be used today if proper research and technological improvement are done on them.
- Ornamental elements should be maintained in interiors and exteriors. Emirates can also include design elements unique to their palace.
- Exterior zanko and indararo should be maintained.
- The Bakan Gizo Hausa vault design should be used as it depicts the development of VANN.
- Finishes could be done in a red-brownish color to depict the initial traditional color of Hausa buildings.

5.1 Conclusion

Palatial architecture in northern Nigeria is significant as it encompasses all of the futures of VANN and is the central unit of a Hausa city. In Nigeria, palaces are living cultural heritage sites that have an impact on how people perceive history and culture. Palaces have to represent the identity of the Hausa people and serve as emblems of power, culture, traditions, etc. Palaces ought to function not only as symbols of Hausa power, culture & tradition they also represent the Hausa's identity. It has been found that several palaces constructed centuries ago retained their significance and importance of preserving their architectural heritage and identity. Other palaces, however, have been replaced with structures that don't seem to share the same preservation. The objective is to preserve the historic palaces' architectural identities over time rather than to replicate them. Vernacular architectural identity

preservation is crucial for future preservation and cultural appreciation, as was before mentioned. We wouldn't have known who we were if our ancestors hadn't left anything behind for us. As a result, we must be careful while designing our buildings to prevent severing the connection to our history.

It has been shown through research that some palaces do practice preservation, however, the techniques employed might be obsolete. Some palaces have changed to embrace a more modern approach, abandoning traditions, due to preservation challenges they may have encountered. In most situations, the expense of preservation is significantly high, and maintaining traditional construction techniques is expensive. Some palaces choose solutions that are simpler to construct and maintain as a result. The lack of skilled labor that has maintained and improved traditional methods of construction is another problem. Modernization is also a crippling factor that has made some palaces move to something new to be more appealing. A generation has emerged over time that might not recognize the significance of maintaining cultural identity and legacy in palaces.

With the right knowledge and comprehension of the construction process and building materials, VANN can be implemented into palace design. Instead of replacing conventional construction materials, technological advancements should be made to address their shortcomings. The ornamental elements that are distinct to this architecture should be retained in the interiors and exteriors of palaces. VANN can be incorporated and interpreted in a plethora of ways without changing its cultural significance. Other than documentation and design solutions in terms of VANN, other ways can help promote the preservation of the identities of palaces. The first is the funding of these preservation works by the government and stakeholders. Being heritage sites, these Emirates could seize the opportunity of having their palaces toured for a fee which could be redirected into preservation work on the palace. Lastly, the National Commission for Museums and Monuments, NCMM can partner with other heritage preservation institutions interested in listing and preservation. Emirates are conscious about cultural identity and are keen on preserving it, however, the correct approaches need to be made to not lose it along the way. If these recommendations are considered, it is possible to prevent palace identities from moving further into disappearance.

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