

# Developing the Traditional Roofing Style in Northern Nigerian Architecture

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**Abstract:** The article is devoted to the study of Traditional Roofing in northern Nigeria, historical developments, influences, changes, challenges and issues experienced from post colonial period to date. The primary target of the research is factors such as; culture, climate, urbanization, and education.

**Key words:** Architecture, housing, northern, Nigeria, roofing, cultural, colonialism, traditional.

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## 1. INTRODUCTION

Nigeria is a country in West Africa. It is the most populous country in Africa. It is geographically situated between the Sahel to the north and the Gulf of Guinea to the south in the Atlantic Ocean. It covers an area of 923,769 square kilometers (356,669 sq mi), with a population of over 216 million.

Nigeria is a regional power in Africa, a middle power in international affairs, and an emerging global power. Nigeria's economy is the largest in Africa, the 25th-largest in the world by nominal GDP, and 25th-largest by PPP. Nigeria is often referred to as the Giant of Africa.

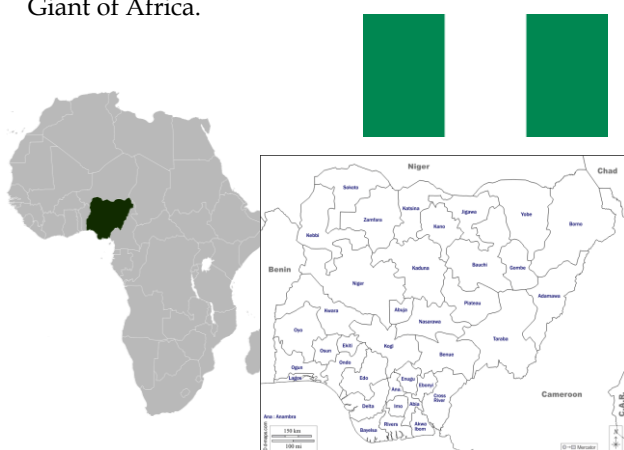


Fig.1 Nigeria's location, Nigerian flag, Fig.1(b) Flag of Nigeria, Fig.1(c) Map of Nigeria

## 2. RESEARCH METHODOLOGY

The roof is an integral part of a building, it makes up the superstructure. The basic function of the roof is to provide cover and protection for the space below it. Among other reasons the roof is made is to insulate the building, protect from the rain, and serve as covering from the heat in form of solar radiation. The two major components of the roof are the frame and the cover or sheet which is laid above it.

This paper concerns an investigation of the architectural evolution of roofing in Northern Nigeria as a key component of a shelter, while describing the collective factors which play a very important role in shaping the current style in use.

### 2.1 REGION AND HOUSING TYPES

**Northern Nigeria –** The northern part of the country had predominantly two styles of traditional residential settlements. The Fulani and Hausa settlements, the former Fulani's are primarily known to be pastoralists, but are also traders in some areas. Most Fula's in the countryside spend long times alone on foot, moving their herds; they were the only major migrating people of West Africa, though most Fula's now live in towns or villages.[1] They were nomadic people and tend to construct their shelter with the most readily available and easy to assemble raw materials these domed houses known as a bukkaru or suudu hudo, literally

"grass house" These mobile houses are very easy to set up, and dismantle, as typical of houses from nomadic societies. When it is time to move, the houses are easily disassembled and loaded onto donkeys, horses or camels for transport.



Fig.2(a) Bukkaru Fulani settlement 2(b) Suudu Fulani settlement.

Hausa traditional architecture was more widely recognized this architectural style is known as Tubali which means the traditional architecture in the Hausa language and globally known as Vernacular Architecture (VA).[2] It was a more permanent and stable housing choice for the growing cities during the era. The style was influenced by climatic, religious and socio-cultural factors of the environment. Tubali is the Hausa architectural style predominant in Northern Nigeria, Niger, eastern Burkina Faso, northern Benin, as well as some West African countries.[3] Traditional Hausa architecture of the north entails much distinguishing architectural and aesthetic features. The major components of the structure usually composes of materials such as mud, reeds, straw, stones, and timber. These components can be found in the various stages of the building construction, the flooring, walls,

windows, finishing, and most importantly roofing.



Fig.3(a) Traditional Hausa home under construction.

Photo: Pinterest, 3(b) Tubali: Hausa Architecture in Northern Nigeria by Sabine Jell-Bahlsen

## 2.2 ROOFING STRUCTURES & MATERIALS

The roofing is considered to be the most challenging component of the Hausa traditional house. These are owing to the decorations and techniques that go into the execution of these roofs. The predominant roofing styles in the north were mostly associated with issues of construction, poor quality, poor maintenance, lack of adequate support and strength, and degradation due to environmental factors. These factors played an important role in compelling a move to a more sustainable alternative with advancements in the building industry. The most common type is the mud roof which has an average span of 1.8m wide space with the "Azara" supporting it at the two extreme ends are the mud walls. The roofing is much wider and usually spans about 2.7-5m. Usually constructed by introducing mud corbels at the top of the wall having a projection of (45cm) creating the facade of the wall with "Azara" reinforcements within. Usually, the room sizes are increased to about 4.0m by introducing an



addition of the "Azara" placed diagonally across the room or horizontally on the opposing spans of the room this serves as a supporting beam for the roof. The roof may be supported on a series of columns connected by "Azara" beams in a grid-like configuration while interiors are filled with "Azara" just simply spanned and distributed" (Sa'ad 1986)



Fig.4(a) Mud Roof with Azara supports at intervals.

#### AZARA AND TATCHED:

- Azara: This is Timber obtained from male palm trees used in making form work for supporting the roof elements
- Birji: This is earth from which Tubali and mortar are made from digging pits called "kududuffi". The extracted earth varies in colour and consistency from pit to pit.
- Tubali: Conical Shaped Building Blocks/Bricks made from Birji made wet and in some cases, to improve the quality of the Birji.

The Ash from burnt timber was often used in providing a layer of insulation, this is spread on top of the flat roofs, and infused from pods and roots serving as a water proofing material. Cornstalks and reeds are most the frequently used materials. The roofs made from cornstalks and reefs were supported by forked poles usually made from saplings, or tree stems of kasfiya or cham tree.[4]





Fig.5(a) Preparing of reed mats, 5(b) Cutting of Azara, 5(c) Mixing of grass to Birji for strength, 5(d) Making of Tubali, 5(e) Excavation of Earth for making of Birji

## 2.3 FACTORS FOR MATERIAL SELECTION

### Environmental Factors:

The regions are hot and dry towards the Northern Sokoto, Katsina and Kano areas. Cold and dusty North-Easterly wind prevailing between October and March. Day time recording higher temperature than night Humidity is generally very low. South-Western More Moisture in the winds prominent around March and October in the more South-Western part of Zaria & Kaduna.

The predominant roofing styles in Katsina, Kano, and Sokoto are of the flat type, which is supported by the low rainfall in these areas, while towards the south in areas like Zaria, the roofs have a dome shape allowing for runoff water owing to the much heavier rainfall in the area.

**Availability:** The selection of materials is very dependent on the ease of sourcing, areas like kano, Kaduna, Zaria and other parts of the north. The Major material Birji, made from excavated soil, laterite composes a large portion of the soil complex in the region. This zone is made up of a mixture of sand and clay. The soil type is described as “grey to black clay, poorly drained and seasonally flooded forming the “fadama”. Soil in this zone is deeply corroded,

generally sticky and impervious to water and has low fertility.”[8]

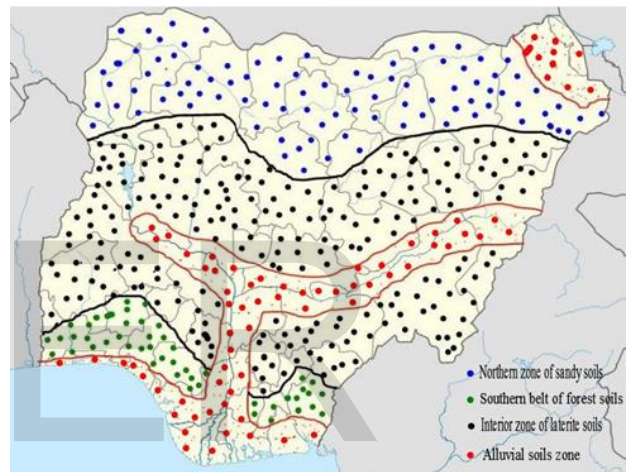
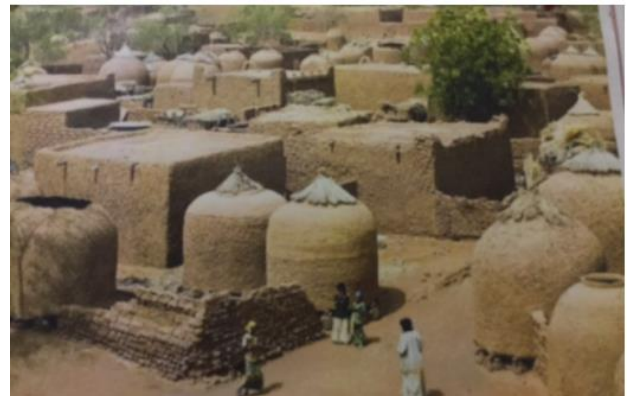


Fig.6(a) Types of roofs with dome shape in Zaria to quicker run-off of heavy rainfall. 6(b) Map showing soil zones and types in Nigeria.[9]



Fig.7(a) Typical Hausa Traditional building roof (Curvilinear conical design).[9]



## 2.4 Factors Affecting Local Roofing Techniques

**Strength and Durability:** “Durability of building finishes and roofing refers to their resistance to deterioration by physical, chemical and biological mechanisms”[5]. The main issue faced with the use of traditional roofing materials such as , straw, bamboo, weaved mats, palm leaves and others in northern Nigeria is the issue of durability. Although the area has less rain than other parts of the country, these local roofing techniques usually require some maintenance about every rain season, or so.

**Climate:** “Climate change has become one of the most exigent concerns of human race today.[6] This zone has a climate that is characterized by a long dry season (and consequently a brief rainy season) associated with cold and dry harmattan wind, high temperature range (owing to hot afternoons and cold nights) and intense sunlight.[7] These materials experience degradation with exposure to climatic factors. This reduces the lifespan of the material by much. In more adverse situations, the materials get destroyed completely and there is need for replacement, all these among other factors make it unsustainable to continue with the use of these local materials.

**Poor Maintenance Culture:** Study has shown that among factors causing deterioration of these roofing structures is the lack of adequate maintenance, leakages are noticed over time with exposure to adverse environmental factors. The absence of adequate maintenance becomes a catalyst for deterioration, and hostile weather conditions in the north make it necessary to regularly maintain. Either by replacement of the mats or patching up of the mud after some washing from rainfall. The study carried out explains that amongst the reason it is difficult to constantly maintain the roof covers is economical factors. The cost factors inquired in the regular maintenance also deter people from keeping up.

**Modernization :** Studies show that among many homeowners, there is a major preference for moving to a modern style of Architecture which opposes the incorporation of the traditional roofing techniques. The urge to conform to social trends and practices has led to a decline and downgrade of traditional techniques. While fewer homeowners are showing interest in the aspect as well.

## 3 CONCLUSION

**Discussion –** The generic response to advancements and development in architecture is an adaptation, modern techniques of roofing have influenced and overshadowed the local methods. Throughout the development of the roofing element in traditional northern Nigeria, there has been little to no development in the aspect of traditional roofing styles. Most buildings have transformed to adopt the modern style consisting of timber frames and covering in form of a sheet of Zinc, or Corrugated aluminum. Leading to an almost complete halt of research and development in the aspect of traditional roofing.

**Conclusion -** The need for conservation and preservation of these cultural methods can not be overstated. Indigenous construction techniques tend to promote harmony and balance with the environment. The promotion of these methods can be achieved through proper research and development. Not only will the challenges experienced with the use of these local materials be solved but also bring about a more sustainable approach to the construction of the roofing structure in this area. It is important to note that these materials: straw, palm leaves, Azara, and Birji, amongst others are and will continue to be readily available for use in the areas of the north. Sourcing and using these materials take far less time, being mostly renewable materials in their natural form.

**Recommendations -** It becomes very clear that there is a need for a specialist to be consulted in the development and construction of these roofing structures. The construction techniques have

experienced little change, as most have moved on to other alternatives.

Also, rural artisans should seek to improve their skills and research ways to develop these local methods to ensure they are revived and maintained. It is also necessary to engage in reforestation practices, this caters to the trees being affected in the sourcing of

these local materials as well as landfills in areas that have been excavated for Birji sourcing.

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