Reflection of Culture and Climate in the Vernacular and Modern Architecture of Akure

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Abstract
The trend towards creating a more sustainable built environment is quite established on the global scale. In Nigeria such sustainable environment can be found in buildings respecting both the culture and the climate. While much is learned from the vernacular architecture even more is discovered by the study of selected contemporary modern buildings in the modern city of Akure. The blend of Brazilian and traditional architecture is depicted in case of the vernacular architecture. Various elements including form, layout, shading devices and finishes are compared in the light of climatic suitability. Some selected modern buildings are identified as suitable for the culture and climate and are presented and discussed. The cultural advantages of courtyard design are explained using historical and modern examples. The response to climate is in consonance with the ecological movement. The buildings provide a good solution in the local environment and reveal the importance of culture and the climate in architecture. They are to a high degree sustainable; they meet the global standard and explore global concept.

1. Introduction
The built environment is the interpretation of the traditions and the aspirations of the local people. Buildings thus reflect the cultural character of the people that live in them (Richardson, 2001). This is indicated by the planning, the way of building and the way of living. Vernacular architecture is presented in the classification of Nigerian architecture as one of the trends (Prucnal-Ogunsote, 2001). It developed from the appropriate continuation of local traditions and sensitivity towards local conditions with a mix of external influences. The vernacular architecture is very common in Akure with the buildings concentrated in the city centre. They are slowly being replaced by more modern structures with prevailing late modern and post-modern trends and with ever present low-trop (Prucnal-Ogunsote, 2002). The unique contemporary modern buildings selected for the study are situated in the speedily developing university complex.

2. The Vernacular Architecture
The Vernacular Architecture of Akure is expressed in forms that have roots in traditional architecture and are also derived from the culture influence of Brazil and a limited European influence. While deeply concerned with their local traditions the local craftsmen derived inspiration from these foreign examples. The external models dominated more and more the choice of materials and techniques as well as the decorations, the size and relationship of the rooms and the formal organization of the dwellings.

The European (British) influence was through the colonial administrators houses constructed mostly from imported materials and through the missionaries who usually built their mission houses and established churches. It had an impact on the choice of materials, extended roof overhang, the size and type of the windows and the general aesthetics.

The Brazilian Style had far more extensive influence on the vernacular architecture. The craftsmen who acquired building skills while in slavery adopted the architectural values of colonial, mostly Brazilian forms. This architecture which was brought back by freed slaves returning to West Africa is different from the traditional huts and colonial structures. It was able to fulfil the need for a more distinguished form. The buildings were often two storeys high built in cement and embellished with heavy ornamental pillars and balustrades. It was a very popular style of nineteenth century Lagos popularly adopted in the multi-storeyed buildings. This style was imitated by the trainee apprentice. The masters’ skills were only partially passed to the next generation. The style spread through extensive imitations and by that stopped being exclusively Brazilian. The richness of the decorative plaster work faded away in the transition to the Nigerian Vernacular Architecture – still very much present in Akure.
The buildings studied are 30 to 70 years old, two storeys high usually with decorated verandas or balustrades and with walls embellished with mouldings, sometimes as surface decoration, sometimes as an organic part of the architectural composition (Plate 1). Some also use plaster relief around windows and doors which often represent decorative abstract designs.

3. Response to climate in the Vernacular Architecture

According to architectural design recommendations Akure is situated in the Coastal Design Zone (Ogunsote and Prucnal-Ogunsote, 2002b, 2002c). Buildings should maintain East-West orientation, with open spacing for breeze penetration. Rooms should be single banked with permanent vents. The windows should be on North and South walls at body height on windward side and they should be protected from rain and direct sunlight. Light, low heat capacity walls are required while roofs should be light and with reflective surface and cavity. No space for outdoor sleeping is required while the protection from heavy rain is needed.

It is thus obvious that buildings need proper cross-ventilation and proper protection from excessive solar radiation and heavy rain. In the vernacular architecture of Akure the buildings are only partially adapted to the climate by the use of mud bricks, asbestos ceiling tiles, roof overhangs, window fins and by the provision of the verandas and balconies as explained below. Far better response to the climate is achieved by traditional courtyard design than the vernacular architecture as discussed below.

Layout and outdoor areas

The studied buildings were constructed without proper plans but rather following the owners’ instructions and they depend on the skills of the craftsmen who managed to achieve a lot. The overall shape of the building plan is usually rectangular and symmetrical. Some have an angular (tapered) approach introduced in the front part of the building in the form of two semi-hexagonals symmetrically positioned in respect of the central axis (Fig. 1). Some of the newer buildings have asymmetrically positioned balcony. In all cases the plan maintains a symmetrical balance except for the stairs positioned on one side of the corridor. The layout of the buildings with the room arrangements has undoubtedly a poor response to climate. No adequate cross ventilation is provided. The long corridor is usually dark. The rooms are positioned in the popular “face me I face you” layout. As a result only the rooms in the corners of the building are cross ventilated by positioning the windows on adjacent walls.

Good shading is achieved at the entrance areas and by the verandas. The entrance is deeply recessed and well shielded from the rain, wind and solar radiation. It is usually covered by the veranda's slab (Plate 2). As a result deeply shadowed areas are created as a response to the local people’s habit of using the frontage of the house for social purposes and for daily recreation. People enjoy sitting in front of their houses.

Analysis of form, structure and materials

The buildings have a pleasant appearance. They maintain good proportions and are well related to human scale. They are also richly adorned. The form is in a way a consequence of layout. In some cases the tapered corners which form semi-hexagons on the plan appear as two symmetrical towers on the elevations. They flank the recessed entrance and the veranda. More of the newer buildings have asymmetrical balconies on the elevation. The base of the veranda in the older houses was initially constructed from timber with moulded balustrades. In the process of renovation this may be changed to a concrete slab with modern balustrade.
The local craftsmen emerged to handle most aspects of the building process. Strip foundations are used with a depth of 30 to 50cm. The buildings are plastered with cement which protects the adobe walls from erosion. On the ground floor there is a solid rammed floor finished with concrete and on the first floor there is a timber floor slab. It is made of hard, well seasoned timber. The beams support the timber planks (Plate 3). There is a timber staircase leading to the first floor with a single flight usually with high risers. The timber floor is very noisy for the ground floor users especially when there are many activities taking place on it. The timber balustrades provided for the stairs are often decorated (Plate 4). Timber beams are also used as window and door lintels.

Analysis of roof shapes

The buildings have high pitched hipped roofs (also referred as Dutch type) with a slope of 20° to 35° to withstand the heavy rainfall. The top ridge of some roofs is parallel to the front elevation while in other cases it is perpendicular (Fig. 2). The eaves of the roof are projected beyond the wall around 50cm to 1m. The roof is covered by the corrugated iron roofing sheets which have poor thermal properties. With time the iron also reacts with water and corrodes turning to dark red in colour. Many houses were renovated recently and now they also have a ceiling that is made from asbestos tiles. This improves acoustic and thermal condition.
Doors, windows and balconies

The entrance to the building is well protected from the sun and the rain. It has ornamental architrave produced by moulding mud and cement to form the design pattern. It is plastered with concrete for durability and projected from the wall. The patterns consist of curves and lines forming a beautiful motif on top with two columns that seem to be fixed to the door (Plate 5).

The doors are mostly made of timber while the windows are often a combination of louvers and casement windows. Some of the doors and high level windows were provided with timber shutters, which with time were replaced with glass windows.

The windows and occasionally doors are shielded from weather conditions by the hoods. They are made of timber or mass concrete of a very small thickness. They have distinct decoration as if curved out with a motif that is similar in most cases (Plate 6).

The entrance of more bogus buildings is adorned by columns with decorative capitals repeated on the first floor. Often the verandas and balconies are designed with precast decorative concrete perforated blocks and balustrades (Plate 1). In some other instances the balcony consists of a simple pattern.

4. Courtyard design in Traditional and Vernacular Architecture

The traditional houses (ile) of the Yoruba had a rectangular plan. A single entrance gate gave access to a number of inner courtyards. They formed a series of separate apartments occupied by closely and usually patrilineally related families ranked according to seniority. There were still larger compounds containing a group of ile, called agbo ile or agbole (Denyer, 1978; Dmochowski, 1990). These buildings were able to respond to the harsh weather conditions by using steep roofs, deep overhangs, courtyards and thick adobe walls. They also responded well to the cultural needs of the people. A good example is presented by the Afin Akure (Fig. 3). The traditional architecture had its limitations due to durability of the materials used but it is insufficient during the extreme weather conditions.

The vernacular architecture did
not benefit from the concept of the courtyard except that there is usually a backyard. The facilities such as kitchen, toilets and pit latrines are constructed in the backyards at a distance of around 3 - 4m from the main building. They are contemporary shed like structures usually properly roofed. The yard obtained is utilised for domestic purposes.

5. Courtyard design in modern buildings
The courtyard is a concept used worldwide in the residential development throughout history. This concept benefits from the cultural inheritance and from local traditions as explained above. In case of the contemporary modern buildings studied the courtyard concept was carefully chosen.

In the Block of Offices there are two symmetrical square-like courtyards within the building linked together with easy circulation provided. The standard for provision of access for the disabled people was followed (Plate 7). They can easily access every room on a wheelchair, as is the case in the CRC building.

CRC is a unique building designed on a honeycomb-like grid (Plate 8). The building has an oblique courtyard which also acts as a passage hence there are two well linked entrances. The courtyard successfully accommodated the drastic change of levels. The sloping terrain was incorporated and helped in raising the height of the bigger rooms for multiple users. The landscape is also beautifully designed with stone works, interlocking brick pavements, decorative shrubs and palms to complement the structure.

The Chancellor’s (Plate 9), Pro-Chancellor’s and Vice-Chancellor’s Lodges are designed with the same concept of a square plan with a concentric square courtyard. The diagonally positioned entrance porch gives the buildings a unique appearance. The Vice Chancellors lodge being a two-storey building has easy vertical and horizontal communication with an access to every room. The courtyard has a porch with a colonnade from two sides.

6. Reflection of tradition in modern buildings
The architects of the studied buildings used the courtyard concept to benefit from the local tradition. Their modern buildings reflect socio-cultural and physical factors of the environment. The local tradition is reflected here in the scale and proportion of the buildings. The buildings relate well to the human scale. The enclosed outdoor spaces make a reference to the traditional courtyard and to the courtyard concept used worldwide. The pleasant appearance obtained in a traditional courtyard by the use of local means (Fig. 4) is also obtained here with the help of modern materials and techniques. These signs provide a
very cameral atmosphere which promotes sense of belonging. All rooms and spaces created are also very proportional and pleasant.

The aspect of provision for social gatherings (always carefully considered and incorporated in traditional architecture) is also carefully considered in all the designs. There are multiple places, corners and niches which people can choose for various individual or group associations. There are places for easy gatherings. The public buildings (Block of Offices and CRC) can easily accommodate a large group of people coming out of the facilities and the group can easily dissipate into the facilities if awaiting further activities. The big groups can also easily leave the facilities because of the positioning of the entrances. There is very easy communication within all the facilities.

The buildings also benefit from modern tradition and thus the Block of offices and CRC can be classified as Late Modern architecture. This pragmatic and technocratic architecture draws its inspiration from the highest achievements of Modernism (Prucnal-Ogunsote, 2001). For example, the architect did not hesitate to make the intriguing parapet wall of the external walls to follow the shape of the roof diverting from modern trend where the parapet wall maintains a uniform height. By that the structure was more economical but it diverted from the common design. The Lodges with their detailing belong to Postmodern Architecture. The postmodern elements present there include the windows with semicircular shape on top, the historical columns at the entrance porch and the columns of the VC’s lodge running two floor’s high near richly decorated balconies. The ambiguous interior spaces maintain the postmodern character by means of decorations and accessibility.

7. Reflection of climate in modern buildings

While our generation is looking towards the post-hydrocarbon society, we are already on alert that the world’s energy is limited and thus the need for sustainable architecture (Smith, 2001 and Stang, 2005). We already have “high breed” building in Abuja – the Central Bank of Nigeria using the latest new glass technology with double glass separated by air cushion significantly reducing the solar radiation. These ultra-modern technologies are very expensive and also the maintenance cost is very high. While CRC and the Lodges also benefited from the modern but more affordable technologies of reflective glass the buildings are sustainable with relatively low maintenance cost due to many other design decisions (Prucnal-Ogunsote, 2002).

There are a number of measures that the studied buildings undertook in respect of the microclimate. In case of the Block of Offices, cross ventilation is provided in each room. The Conference Room got the best by benefiting from two courtyards while the entrance/exhibition area is always cool and breezy due to the open access to two courtyards and to the main entrance area with a very well shaded entrance porch. The Cyber Café (a public space that requires bigger volume of air) benefited from the sloping terrain by obtaining much higher ceiling level than in the regular offices. That also helps in maintaining better microclimate of this public area.

Very good cross ventilation is also achieved in every room in the CRC. This building has especially addressed and focused on the microclimate. One experiences sense of relief by entering the various spaces so well protected from sun rays, sun glare and the rain. This is mainly achieved by the use of the projected parapet wall which is lowered in an optimum way and seems to slightly cover the windows giving it the necessary sun/rain protection and by the passage running round the courtyard with various
recesses. The issue of rain entering the rooms through the windows (a very usual problem in other buildings) can hardly arise because of the unique parapet wall and roof design. The water is efficiently drained out from the roof towards the central courtyard and flushed out through the internal spouts to the gutter which occupies the entire passage area making the gutter large and very effective (Fig. 4). The gutter takes advantage of the natural slope that even further enhances the efficiency of the drainage design.

In the design of the Lodges climate played a vital role. The roofs have adequate slope of around 30° and also window hoods are provided for most of the windows. The outdoor sitting areas are provided in the courtyard well shielded from the sun. Balconies and big entrance porches are provided in the VC’s Lodge. These are also well shielded from the rain and sun. The positioning of the windows and the use of double volume in the case of the sitting room which incorporates a two-storey void improve the ventilation of the interior (Fig. 5).

8. Conclusion
The analysis revealed that in architecture both the culture and the climate play a vital role. The vernacular buildings are very popular in Akure and they reflect sensitivity to local culture mainly by adopting the adobe mud bricks in these then-fashionable two-storey structures. They are also sensitive to social needs of the users through provision of outdoor areas (verandas and balconies). They exhibit the sensitivity to the climate only to a certain degree as a result of trying to be fashionable rather than benefiting from the traditional courtyard design. The roof is very adequate and takes care of the heavy rainfall. The window hoods provide adequate sun and rain protection for the openings; the recessed entrance is well protected from the rain. They also manifest the need for novelty reflected here by the western influence. By modern standards however the provision of utilities (toilets, kitchen) is not adequate, even creating hazardous environment due to the presence of open gutters and deterioration of these temporary structures. There is need for societal
intervention to raise the sanitary standard. Also worrisome is the haphazard conversion of residential facilities for commercial purposes. Many shed-like structures are added in the front of the buildings. If the usage was more controlled by both the stakeholders and the government the whole environment would have been more sustainable instead of the chaos created unnecessarily lowering the standard of living. This standard was initially set high (despite the low cost) by the quality of the vernacular architecture in Akure. The buildings paid a lot of attention to aesthetics. They are proportional and have simplified but beautiful decorations distorted now by the ugly additions.

There are vital elements that make the selected contemporary modern buildings sustainable. The energy consumption for artificial cooling and ventilation is minimized and as a result they are more cost effective and more comfortable in line with global ecological trends. The designs paid a lot of attention both to the climate and the culture. The facilities which are already in use prove their positive qualities on a daily basis. The final conclusion stresses the need for carefully planned environment that is capable of controlling people’s behaviour and takes into consideration the local traditions and the environment.

9. References


