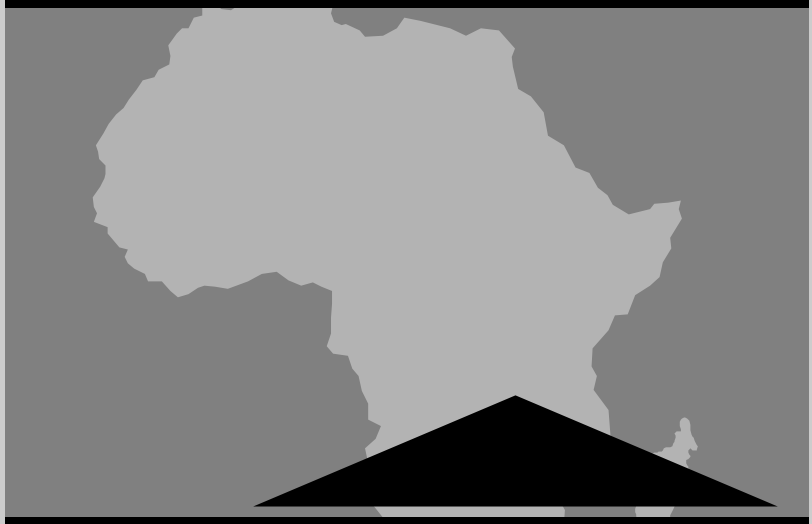
Africa HABITAT



Review 1(2006)

Journal of the School of the Built Environment, University of Nairobi

Africa HABITAT
Review 1(2006)

AFRICA HABITAT REVIEW JOURNAL

Volume 1, Number 1
November 2006

Volume 1, No.1. November 2006

Editor	Dr. Robert Rukwaro
Assistant Editor	J.W Kamenju
Editorial Board	Mrs. Winnie Mwangi Prof. Washington H.A Olima Mr. E. Ogeto Mrs. Francisca Odundo Evans Mairura Kamweru Kigara Ms. Anna Njambi Kinyungu.
Editorial Advisory Board	Prof. Paul Maurice Syagga; University of Nairobi, Kenya Prof. P.D Rwelamila; UNISA South Africa Prof. Raymond Mnaemeka Nkado; University of Witwatersrand, South Africa. Prof. O. Mazrui; Kenyatta University, Kenya. Dr. Daniel Irurah; University of Witwatersrand, South Africa. Ahmedabad, In. Prof. Sheila Danko Cornell University Prof. R. Obudho, University of Nairobi, Kenya
Internet	Log unto our URL: www.uonbi.ac.ke/colleges/faculties/add/Africa_Habitat_Review
Email	fadd-jnl@uonbi.ac.ke
Advertising	Please contact the Editor for details
Subscriptions	Including Shipping and handling) Individuals (within East Africa) Kshs. 250 (outside East Africa) US$. 5 Institutions (within East Africa) Kshs. 200 (outside East Africa) US$. 4.5 Cheques should be made to Africa Habitat Review Journal Orders: New order requests should be made to the following editorial and business address: The Africa Habitat Review Journal School of the Built Environment (SBE) University of Nairobi P. O.Box 30197, Nairobi, Kenya

LIST OF CONTRIBUTORS

Benard Otoki Moirongo
He is a Senior Lecturer in Department of Construction Management, Jomo Kenyatta University of Agriculture and Technology. He is also the Director of School and Architecture and Building Science. His interest is in architectural design and construction management.

Ephraim W. Wahome and Anne-Marie Deisser
The Karen Blixen House: The Challenges Associated with the Conservation of Historic Buildings and Collections

Kamau Karogi
Currently teaching in the Department of Architecture as a Senior Lecturer. He was also a former chairman of the Department for many years and also a former Dean of the Faculty. His special interests are in Architectural Design, History and Theory of Architecture.

C.O.Osasona is a registered Architect, and a Senior Lecturer in the Department of Architecture, Obafemi Awolowo University. His publication covers various expressions of built form, both in the traditional and contemporary contexts.

Namnso, Bassey Udoekanem is a lecturer in Department of Estate Management, Federal University of Technology.

EDITORIAL NOTE

The birth of our own journal is a milestone in the furtherance of our academic excellence. The idea was moulded in 15th August, 2002 by then the former Dean, Kamau Karogi, of School of The Built Environment. The journal has very clear objectives and they read as follows:

- To produce knowledge and exchange of ideas among participants in the built environment.
- To disseminate research findings to all in the built environment.
- To afford a forum for stakeholders in the built environment to keep abreast of new technology, research and development so that they can improve the efficiency and effectiveness of their services.
- To allow all (academic and non-academics) in the built environment to publish, to lobby and to influence others positively.

This inaugural issue is dream come true and the editorial team will endeveour to regularly (bi-annual) produce similar issues without fail. The articles appearing in this first issue focus an built environment in diverse ways. The articles titles include: training of African architects with emphasis in historical anthropology; conservation of historical building; concept of fencing urban homestead compounds; towarding improving urban public spaces through management of solid wastes, and Market Valuation of Residential Investment Properties; The Case of Reversionary Freehold and leasehold Properties in Uyo, Nigeria.

The success of this journal is dependent on you the academician and it hoped that the future issues will include your contributions on a well searched topical issues in your built environment

Editor in Chief
Robert Rukwaro

Africa HABITAT Review 1(2006)

CONTENTS

The Influence of Urban Public Space Patterns on Degradation of External Envelope of Urban Blocks: The Case of Nairobi Central Business District

***Bernard Otoki Moirongo**

Received 19 May 2004; received in revised form 17 March 2005; accepted 3 March 2006.

Abstract

A view through Central Business Districts (CBD) of most Kenyan cities show that some buildings have either been abandoned or been left unattended thus, enhancing dereliction and decay of the built environment. Since it is not whole city centres that are decaying, it is likelys that the spatial structure and hence the urban space patterns would be having something to do with social, economic and the environmental survival of these capital assets. This paper has empirically established that 33 urban space variables out of 436 variables significantly relate with dereliction and decay of built environment in the Central Business District of the city of Nairobi. This has been done by regressing indexes relating to abandonment, façade construction, completeness and exterior maintenance and cleanliness of buildings bounding urban space against urban space variables: spatial, social, cultural and economic. These established variables have been grouped into the following urban patterns: constitutedness of space, segregation or integration of space, distributedness of space, grain, land use, and density. The paper argues that most of these patterns have a lot to do with the presence and distribution of human in the settlements. The paper concludes that humanisation of settlements is very important in curbing the decay of built environment.

Key words: *Urban space, Building degradation, Space syntax, Nairobi, CBD.*

achievement of urban environmental management and hence environmental sustainability through management of dereliction and decay of built environment. The approach has been through the establishment of urban design patterns that would assist in alleviating the present problems and hence sustaining the urban environment in the third world city centres. Urban environmental sustainability has become a global issue at the moment and hence an appropriate area for research. This is because, previously, researchers focused on different elements of the urban form. But this has been inadequately related to urban management.

2. Definition Of Key Concepts

For better understanding of the paper, it is necessary to highlight the key variables of this research especially those adopted from space syntax theory. In this regard therefore the following terminologies have been defined.

Building space index of a space that is also known as the measure of constitutedness of the space refers to the number of buildings that are both adjacent and directly permeable or accessible from or to the space. This is in most cases referred to as permeability of the space.

Permeability per unit area is obtained by dividing building space index by the area of the convex space in question to get the intensity of buildings being accessed from that space per unit area of the space.

Degree of adjacency and impermeability refers to the number of buildings that are adjacent but have no access to the space.

Axial connectivity of a space refers to the number of axial spaces intersecting that axial space.

Depth of space from carrier space is a value that describes the location of the space in relation to the space surrounding the settlement that is also referred to as the carrier space. This is measured in terms of axial spaces one has to pass through before reaching that particular space.

Relative depth of axial and/or convex space that is also known as the measure of integration is a measure of depth of the whole settlement from that particular space. This is obtained by assigning a value of '0' to that original space and numeral '1' to the next space, numeral '2' to the next space and so on until all the spaces are accounted for. The average depth value is the relative depth of that convex or axial space that had been assigned numeral '0'. This exercise is repeated and always starting with the space whose relative depth is required. Low values of depth means all spaces are directly connected to the original space and therefore the system is shallow to that space and hence the space tends to integrate the system. High values of depth means all spaces are arranged in a unilinear sequence

** Dr. Bernard Otoko Moirongo Ph.D. Director : School of Architcture and Building Sciences Jomo Kenyatta University of Agriculture and Technology; P.O.Box 69612-0400 Nairobi-Kenya;Email: bmoirongo@yahoo.com*

Africa HABITAT Review 1(2006)

away from the original space, that is, every additional space in the system adds one more level of depth and therefore the system is deeper relative to that space and hence it tends to segregate from the system.

Relative depth of a space is thought of more simply as the measure of integration. This is because, relative depth is a value between '0' and '1', with low values indicating a space which is shallow, that is, a space which tends to integrate the system, and high values a space which tends to be segregated from the system (Hillier & Hanson, 1984: 109).

A space tends to have a higher relative depth if enclosed by an impermeable blocks of buildings, which does not allow shorter routes to the space. This unitary and superordinate control of space creates such strong hierarchy that naturally excludes people from the space. This in turn implies fewer economic activities, less income, and therefore less expenditure on buildings hence the least likelihood that facades least exposed to the public will receive a layer of plaster leave alone a layer of paint. The least permeability in the sense of doors implies that facades fronting passages and back streets are rarely completed as they are of no commercial benefit to the developer. This situation has been seen to drastically change in spaces where businesses have developed. This implies that economic improvement or sustainability just as social sustainability has a lot to do with environmental sustainability. They go hand-in-hand.

Axial connectivity of a space refers to the number of axial spaces intersecting that axial space' (Hillier & Hanson, 1984: 103). The shorter the blocks located along a spatially one axial space the higher the axial connectivity. After Jacobs (1961), it in turn implies that such space and constituting facades or buildings are more exposed to the public as more people find it convenient to cross through the space. The more the people are expected to use the space the more the advertisement displays, facade articulation and generally the more the private domain moves to meet the public, hence the better the environment.

Constitutedness refers to physical and/or visual interaction between interior spaces and urban public spaces. It therefore mainly deals with permeability and transparency of the urban boundaries separating the two. This is supplemented by the proportions of the urban solids to each other and their relationship with the urban voids. These issues are fundamental in establishing accessibility and surveillance of the solids from the voids and vice versa. It also plays a role in creating a sense of belonging in the public urban space. Constitutedness is therefore necessary in the humanisation of public urban space and the activities taking place therein and within the surrounding urban blocks. This, in turn implies that a well - constituted space is always full of human activities, hence besides hindering the happenings of un-conforming activities, it promotes social and economic activities. Within such environment, the buildings and the urban space are fully utilised thus enabling the realisation of higher returns for the developments and therefore the need to maintain and conserve the capital assets. This is why buildings bordering unconstituted spaces are functionally obsolete and hence characterised with abandonment, decay and even incomplete construction or maintenance.

A segregating space refers to one that has the ability by virtue of its location or definition to separate functions and groups that differ from each other, for instance, the inhabitants from the strangers. The separation can be in visual or physical terms. An urban space said to be deeply located in the settlement or 'hidden' means that it has no direct link to the area surrounding the settlement and therefore anyone approaching the settlements and destined to such particular space is forced to pass through several spaces before reaching it. In such case, all spaces are arranged in a unilinear sequence away from the original space, that is, every additional space in the system adds one more level of depth and therefore the system is deeper relative to that space and hence the space tends to segregate or be more removed from the system.

This kind of system is asymmetrical, hierarchical and non-distributed and has characteristics like, containment and autocratic. If inhabitants move out of such environments and the spatial structure of the settlements still makes it difficult for strangers to gain access to the space and therefore is definitely bound to be abandoned, un-maintained and left to decay. This is unlikely to happen in integrating spaces because they have the ability to let or enable various activities and categories of people in a community/settlement to function together or side-by-side. This is similarly by virtue of its location and definition. This is a kind of space that is located in the settlement in such manner that it easily provides linkage between other urban spaces. In most cases, such space lies within a symmetrical, distributed system and is a controlled space. Symmetrical relations refers to the ability of one space having access to other spaces that in actual sense means that there are at least two routes between any two points.

A space is controlled if the sum of activities or (human) traffic generated in the neighbouring spaces and received by the space is higher than the sum of the other neighbouring spaces. Control therefore, refers to the ability to receive a big share of the activities generated in the neighbouring spaces. This has a lot to do with the

scale of the space besides the other issues dealt with earlier. This implies that a controlled integrating space always has human activities taking place therein and encourages flow of the same activities throughout the rest of the urban space. Therefore, there is a continuous human surveillance of urban spaces and assets within such set-up. It is this human traffic that creates social and economic activities that keeps any built environment surviving. This is why humanisation of settlements has been found successful in the revitalisation of inner cities.

Grain is another important parameter that influences the dereliction and decay of built environment. It deals with scale and ability of the built elements to mix. Fine grain would therefore enable easier mixing and thus promote integration, diversity, and mixed use in the settlement.

Fine grain also promotes distributed properties that are essential for creation of public spaces e.g., constitutedness, and ring connectivity. On the other hand coarse grain makes mixing difficult and as such promotes segregation and homogeneity, which in turn creates bounded territories. This is why diversity goes hand-in-hand with mixed use. Mixed use definitely implies more variety and hence diversity. This makes people of different cultural values; class, income, age, race, colour, needs and even perceptions meet in any given place. Their opinion is very vital to the space's development. This is why Jacobs (1961:99-151) argues that 'in cities, liveliness and variety attract more liveliness; deadness and monotony repel life. And this is a principle vital not only to the ways cities behave socially, but also to the way they behave economically. Only a genuine content of economic and social diversity, resulting in people with different schedules, has meaning to [any urban space].

The following must prevail for any meaningful diversity to exist: district to serve more than one function; most blocks must be short, the mingling of buildings that vary in age and condition must be fairly close-grained; and there must be a sufficiently dense concentration of people'. She goes further to point out that 'diversity creates economic strength, social vitality and magnetism that brings about: a continuous network of safe space neighbourhoods due to mingling of strangers and residents; destruction of border vacuums; creation of community of old and young and encouragement of un-slumming of slums' (ibid: 409). These encourages residents to stay put and improve the living conditions thus converting the self-destruction of diversity and other cataclysmic uses of money into constructive forces. As a result creating a good economic environment for other people's plans and clarifying the visual order of cities by both promoting and illuminating functional order (ibid: 409). Such scenario therefore creates a sense of belonging that also encourages proper and completeness of construction and maintenance of capital assets.

Another aspect of land use important for development and sustenance of urban space is density. It's importance has been illustrated by Jacobs (1995:289) when he argues that 'density and land use matters are important to streets. Void of human activity, streets soon cry out for people, they need people at the same time as they are for them; they are activated by people at the same time as they contribute to making a community for them. And that is achieved in considerable measure by having many people line along them or nearby a matter of density.

3. Review Of The Literature

This paper address two aspects, that is, public urban space and urban blocks in a settlement referred to as a Central Business District (CBD). Most settlements seem to be made up of the same kinds of elements: closed elements like dwellings, shops, public buildings, and so on, which by their aggregation define an open system of more or less public space, that is, streets, alleys, squares, and the like, which knit the whole settlement together into a continuous system (Hillier and Hanson, 1984: 89).
Public urban space refers to all types of space between buildings in towns and other localities (Krier, 1991: 15), whereas, an urban block is an area of land surrounded by a public right-of-way or public urban space for that matter (Jacobs, 1995: 262). In most cases this urban block is developed into some structure or building that in turn defines the urban space. The relations between urban space and urban block or between different urban spaces or between different urban blocks are what have been referred to as urban patterns whereas the process of realising those urban patterns is urban design.

Design is a methodology that, when applied to public policy, can help solve some of the problems of misallocated resources, misused land, and the unnecessary destruction of historic buildings (Barnett, 1982:7). Therefore, urban design is the generally accepted name for the process of giving physical design direction to urban growth, conservation, and change. It is understood to include landscape as well as buildings, preservation and new construction, and rural areas as well as cities (Barnett, 1982: 12).

In urban design, the concept of urban spatial pattern is concerned about the geometric disposition of the physical elements of the urban environment. So far this aspect of urban form has been described in many ways (Gallion and Eisner 1963, Spreinegen, 1965, Lynch, 1971, Malt, 1970, Broadbent, 1990), but this study relies heavily on the description given by Trancik (1986:101) Trancik has defined 'spatial patterns as solid-void relationships'. This type of description concerns urban spatial patterns as

Africa HABITAT Review 1(2006)

being relationships of urban solids and urban voids. Urban solids may be individual buildings, group of buildings or urban blocks. Urban voids are the urban spaces. Since urban space patterns facilitate the relations between all the urban elements, it therefore has a lot of impact on the environment of the external envelope of urban blocks.

Physical conditions of elements defining a place and quality of out-door space determines the human activities that take place in the space (Gehl, 1996). Even a relatively limited deterioration of the quality of the outdoor environment can have a disproportionately severe negative effect on the extent of outdoor activities (Gehl, 1996: 37). Buildings that are of different sizes and scales, house people of different incomes and ages with different family characteristics,Those buildings have doors or entrances facing the street, have many windows and have porches that permit people to inhabit the street without actually being on it are known to be well cared for. However, generally dull, lifeless street space with characteristics such as long stretches of blank walls or screened windows deteriorates totally becoming a roadway parking lot (Jacobs, 1995).

However, in the nineteenth century, as buildings became more utilitarian in their organisation, the notion of function was gradually displaced from the external space to the organisation of internal space. A building tended to become, in itself, more of an object, separate from its context (Anderson, 1978: 341). This has been achieved by abandoning the principles of urbanism and the human dimension of out door space established in the design of cities of the past and instead introduced environments of high-rise towers removed from street life. This concept has been reinforced further by use of enclosed malls, arcades and plazas (Trancik, 1986: 8).

On the other hand, it should be noted that real estate developers have one overwhelming obvious objective: they want to make money; and, as they are in a high-risk business, they want to make a great deal of money. Some people who are concerned about the future of the environment feel that it is wrong that the guiding principle of development should be the profit motive, and even the real estate investor is likely to agree that private enterprise has generally not been successful in creating satisfactory cities, or in conserving the natural landscape (Barnett, 1982: 57). This provides reasons as to why the manner in which urban design and building degradation especially to do with the external envelope relate is researched on.

Physical degradation or degeneration of buildings is a gradual process in which some parts decay faster than others. This is due to age, environment, poor construction and lack of maintenance among other reasons. It also leads to obsolescence that is physical, functional-economic, and cultural. Obsolescence therefore needs human intervention. This is because the accelerated pace of functional change makes many facilities obsolete before they decay. Cultural obsolescence originates in changes of taste or fashion, which determine not only what looks “old” or “new”, but also the economic benefits of a commercial facility in a consumerist market. Therefore and definitely urban space patterns have a lot to do with the functionality and well being of urban blocks.

Dereliction and abandoned buildings

Dereliction refers to something that is 'not used or cared for and in bad condition' (Hornby, 1997: 313). According to Parfect (1997: 76), 'derelict sites and buildings contain unsightly buildings that are vacant and also fully or partly derelict, or where the sites are themselves left vacant and exposed, and become a depository for litter of various kinds of quantities'. In the case of building, this is due to obsolescence and economic difficulties. Obsolescence in this case can be grouped into three categories, that is, physical, functional or economic, and cultural (Lozano, 1993: 103).

Physical degeneration of buildings referred to here is a gradual process in which some parts decay faster compared to others. Accelerated pace of functional change makes many facilities obsolete before they decay. For instance, the leaving of town centres by residents and business communities to the suburbs in search for supposedly better environment has been cite as a good example of the causes of obsolescence (Worpole, 1992: 14-28). It therefore clearly implies that urban design and planning trend usually have an effect on physical conditions of both the built and unbuilt environment. In turn, deteriorating physical conditions causes a decline in downtown investments … and, consequently, in its retail economy (Bramilla, 1977: 127). Such scenario therefore causes decline in development as opposed to sustaining it.

Incomplete Facades

Anderson (1986: 130) has argued that 'the exterior spaces of the city are the rooms of the city, and the built structures are the walls of those rooms. These walls owe a responsibility to the formation of those rooms. The interior functional considerations of buildings can be co-ordinated to allow them to perform the function of creating exterior city space. Therefore, the notion of an equivalency between the solid and spatial elements of a city is an important one'. Secondly (Anderson, 1986: 115), 'the idea of differentiated exterior space is a distinction that depends for the most part upon the nature of the backs and fronts of buildings. In the traditional city,

the structure of spaces, the typical block structure is made up of buildings that have a basically different condition of back and front. Fronts relate to fronts, forming a street space; backs relate to backs, generating a courtyard space'. The modern city exhibit two distinct urban blocks that constitute variations of exterior spaces. One is where the modern urban block, that is, 'the point tower and the linear mega-structure that provides ventilation and view to their occupants.

There is no distinction between fronts and backs; the configurations allow no means for articulating pieces of space from the surrounding continuum' (Anderson, 1986). Second, where linear blocks' fronts relate to fronts, forming a street that encloses internal courtyard in form of service yard and light well, while maintaining boundary walling all round the plot. This means that the backs relate to backs, generating no man's land that is referred to as back streets or service lanes. These back streets are at times joined to the main streets by much narrower spaces referred to as lanes or passages

Where the latter scenario exists, for instance, in the City of Nairobi, the quality of construction and maintenance, facade design and articulation and generally people's attitude towards the different types of spaces varies drastically a cross the board. Unlike the former scenario where 'urban space is geometrically bound by a variety of elevations and clear legibility of the building's geometrical characteristics and aesthetic qualities that allows one to consciously perceive external space as urban space' (Krier, 1991: 15), it is completely the opposite in this case.

There are several reasons as to why such urban spaces have developed in Nairobi. Most likely this kind of urban space structure would have originated with the colonial governance and the borrowing of the 20th Century design concepts from the west without integrating the African culture. Alternatively, it would be due to wrong interpretation of the western concepts in a different culture, climate, and general environment. This is because, for instance, Africans were seen by the colonial Government as rural dwellers, so their urban stay was regarded as temporary. This meant that urban policies for the African quarters, such as, organisation of space, size of plot and type of construction, were different from the others. It is unfortunate that some of these practices still exist even after Thirty years of independence.

Quality (Maintenance & Cleanliness) of Buildings

Quality refers to the wellbeing of the physical assets of an urban set-up. Better quality ensures a functionally efficient environment to users. This, by and large depends on numerous issues, such as, cost involved, design of both the assets and surrounding space, attitude of society towards these assets and material used. This ability to keep these assets to a currently acceptable standard and sustain the utility and value of the facility can always be seen in their physical status. Therefore, when society or the users of these assets are physically or psychologically removed from the assets or the community, 'society and environment are in disarray' (Parfect 1997:7). Such situation is reflected in 'the growth of street litter, ill-maintained buildings and street fabric, garish or simply neglected sign-writing in the general scene, and derelict urban sites used as rubbish deposits as not only indicators of economic malaise but also a symptom of a society that is alienated from its surroundings and, frighteningly, that is not even seeing the effects of general neglect any longer' (ibid: 7). This is why Krier (1993:27) has pointed out that 'transparency within the urban structure is the only means of halting the decay of the inner area of the blocks, which have lost their direct relationship to the public cityscape'. This was achieved in his urban proposal for Altona Nord by subdividing the gigantic old blocks into small units. Transparency has two interpretations, a glazed building can be said to be transparent whereas transparency of space is primarily in the sense of a flowing transition from one space to another. In this scenario Krier refers to the latter if not both of them.

Statement of hypothesis

It is possible that one of the reasons accounting for the dereliction and decay of built environment in the African cities is the failure to incorporate appropriate design. This implies that the null and alternative hypotheses are as follows:

H_o: No relationship exists between urban spatial pattern and dereliction and decay of built environment.

H_A: Relationship exists between urban spatial pattern and dereliction and decay of built environment.

4. Methodology

The study area on which this paper is based is the Central Business District (CBD) of the City of Nairobi, Kenya. The CBD of the city of Nairobi forms the oldest part of this 'transportation' City that was established as a colonial post in 1895. It covers about 5km^2 out of 693km^2 that constitute the city region. This centre was planned and designed to the British standards and in line with the 20th century modern city concepts. However, it differs from other 20th century cities in the sense that it was developed on segregation lines based on economic, racial, cultural and social differences of the inhabitants of the city. Since its inception, the centre has experienced tremendous changes due to intense development and regional expansion that has enhanced city sprawl, population increase due to natural and rural-urban migration. This has seen among others changes in use of earlier

buildings/indoor spaces and even public urban spaces. In this process of urban development, urban space variables and hence urban patterns that influence dereliction and decay of built environment associated with the urban space have consequently developed. This is due to the evidence of variation in intensity of abandonment, construction completeness and maintenance levels of buildings defining the public urban spaces. It is the intention of this paper to unveil these patterns.

Data collection

Data collection involved map analysis, observation, measurement, and interviews in relation to the sampled urban spaces. This necessitated reconnaissance survey and sampling of urban spaces.

Dereliction and decay of built environment was measured in terms of abandonment of buildings, construction completeness of facades, and exterior maintenance and cleanliness of buildings. These variables were used as dependent variables in a multiple regression analysis to investigate issues or variables (e.g., spatial, physical, social or economic variables) that could predict them or could explain their variation in different spaces. In such analysis, the other variables are known as independent variables. The independent variables were divided into two categories. The first category consisted only of variables that could explain the distribution of urban space in relationship with itself or with enclosed spaces. These variables have been termed 'alpha variables' and mainly deals with the structure of urban space. The second category consisted of all variables including alpha variables.

Reconnaissance Survey

Firstly, the survey located and mapped out all the building structures existing on the ground and compared them with the block plan that existed then. Drawings of buildings missing on the block plan were accessed at Nairobi City Council and their plans drawn and fixed. The complete block plan of the CBD was then used for a second survey that located all the physical accesses to each building. This was a prerequisite for alpha-analysis. Secondly, the reconnaissance survey established the general trend of dereliction and decay of built environment in different types of public urban spaces. This means that the survey generally established which problems existed where and their variation in intensity throughout the CBD public space. In this regard, the survey realised that dereliction and decay of built environment vary from one space to another throughout the CBD. This gave an impression that urban space variables as well as spaces themselves varied. This helped to sample different urban spaces defined by buildings with varied characteristics. This was necessary for the research to achieve any meaningful results. Thirdly, the survey also aided in finalising the research checklist and the sampling processes.

Sampling Design

The main data for this research were obtained through alpha-analysis and the field data collection aided by a questionnaire and checklist. The alpha analysis derived spatial variables that describe the urban space structure and formation, whereas the field survey collected data in regard to the conditions of the buildings constituting the urban spaces, design variables in regard to individual urban spaces and other related general information. One questionnaire was completed for each sampled urban space.

The alpha-analysis established statistics for all convex and axial spaces in the whole CBD. A space is said to be convex when a straight line drawn from any point in the space to any other point in the space does not go outside the boundary of the space. Whereas, an axial space is one represented by a group of convex spaces arranged in any given axis. Since it would not be possible to obtain statistics on all buildings for all urban spaces, it was therefore necessary to sample 40 convex spaces out of a population of 1265 spaces (Figure 1). The sampling criteria took into account four considerations: The quantity of the spaces had to be equal to or greater than thirty for the sample size to fall within a normal curve and hence represent the parent population. Secondly, the sampled spaces had to represent the dereliction and decay of built environment trend established through the reconnaissance survey. This meant that the sampled spaces had to include spaces with buildings with varied levels of completeness, abandonment, and maintenance. Thirdly, the sampled spaces had to take into account or represent all the different types of urban spaces (e.g., front yards, arcades, streets, passages, lanes, malls, squares and other open spaces). Lastly, the sampled spaces had to represent a reasonable proportion of the spatial statistics established by the alpha analysis. Only then would the data analysis and synthesis be meaningful and comprehensive.

Another very important aspect worth mentioning is that the study was based on convex spaces and not on axial spaces. This helped to standardise the different public urban spaces studied. Since convex spaces are constituents of axial spaces, they were assigned and assumed to have the same axial spatial statistics of the axial space within which they belong.

Spatial variables referred to as alpha variables in this paper have been derived from the Y and axial maps in Figures 2 and 3. The Y- map is the transformation of the convex map into a graph or diagram in which points

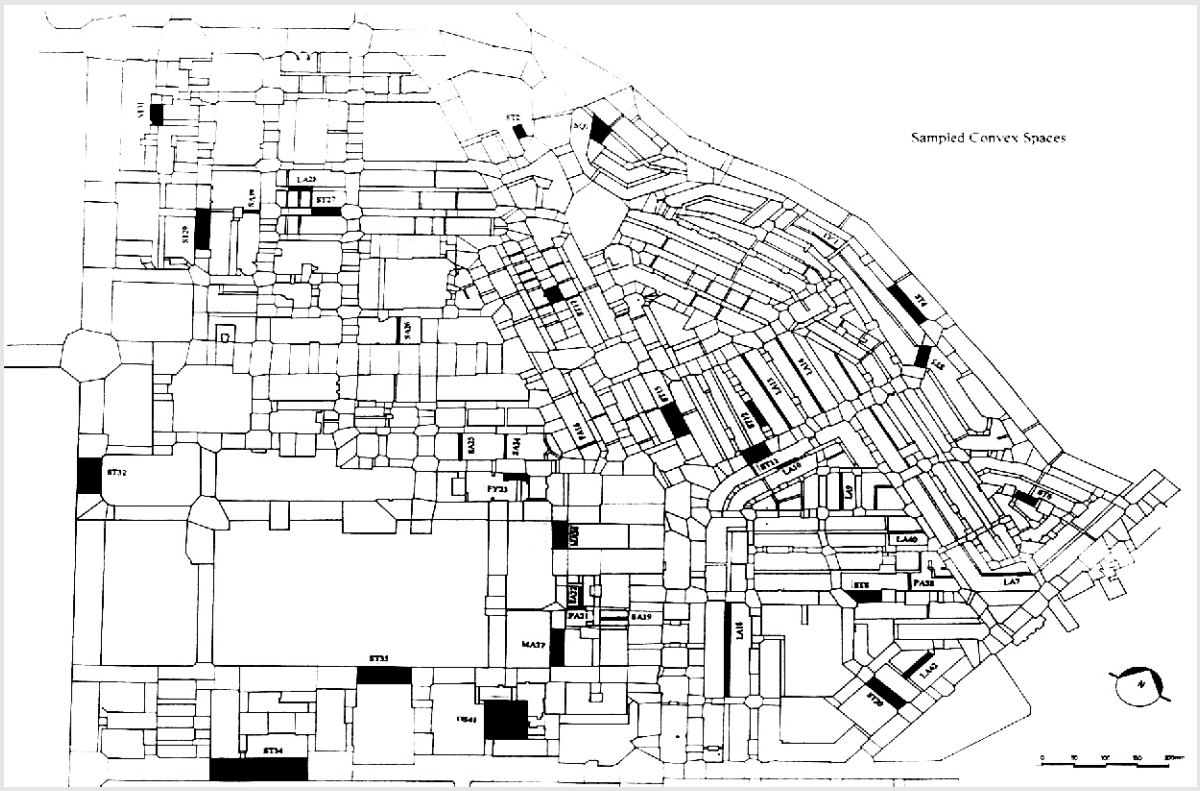


Figure 1: Nairobi CBD showing the sampled spaces and studied buildings, in November 1998. **Source:** Author.

Figure 2. Y-diagram of the CBD of the City of Nairobi showing sampled spaces for detailed study. **Source:** Author

Figure 3. Axial diagrams of the CBD of the City of Nairobi showing axial spaces within which the sampled convex spaces lie. **Source:** Author

represent convex spaces and lines represent relations between them. The convex map is made by a process that involves simply finding the largest convex space and drawing it in, then next largest, and so on until all the space is accounted for. Whereas making an axial map involves finding the longest straight line that can be drawn in the open space and drawing it on an overlaid tracing paper, then the second longest, and so on until all convex spaces are closed and all axial lines that can be linked to other axial lines without repetition are so linked (Hillier & Hanson, 1984:99).

5. Data Analysis and Interpretation

Statistical Package for Social Science (SPSS) was used in the data analysis to establish significant relations between abandonment, façade construction completeness and maintenance and cleanliness levels as dependent variables and all the other variables as independent variables. The abandonment and façade construction completeness were measured in terms of ratio of buildings with the problem, whereas building maintenance and cleanliness level was measured qualitatively by aid of a scale of '1' to '5'. The independent variables included spatial, physical, social and economic variables of the sampled urban spaces. The multiple regression analysis established the significant relations. Analysis of variance (F) at 95 degrees confidence level was used to test the significance of the relations. If variables were found significant, it implied that the alternative hypothesis is accepted. Due to multicollinearity some variables were found having different signs from that of their correlation with the dependent variable; however, this problem was solved by dropping highly collinear variables of correlation greater than 0.7 from the models (Salvatore, 1982: 182). In this regard therefore, the established models are regarded as appropriate predictions of the dependent variables.

Modelling abandoned buildings

Abandonment of building was measured as a ratio of number of buildings not in active use to the total number

Percentage of abandoned buildings adjacent to the space = 0.05112 + 0.053S_{16} +/- 0.182 δ
Model 1

Percentage of abandoned buildings adjacent to the space = 0.192 + 0.024S_{16} + 0.004B_{16} + 0.005B_{33} + 0.912E_{31} + 0.011G_{22} - 0.002D_{16} - 0.323E_{35} -0.009G_{51} +/- 0.0917 δ
Model 2

of building fronting the urban space studied. Degree of adjacency and impermeability is the only alpha variable found significantly related to abandoned and derelict buildings as shown by Model 1. It predicts 55.8 percent of the dependent variable. This means that 55.8% of the abandoned buildings have no physical access from the urban spaces studied. It therefore implies that either, the initial use of the buildings must have moved out to better places and no other use took over the building space thus necessitating the permanent closing of all entry points to the building(s) and hence resulting into deterioration. Alternatively, it implies that impermeability encouraged least movement through the adjacent urban space and as such no economic activities thrives in such structures that would raise enough funds to rehabilitate them. In either case, permeability emerges strongly as an important parameter for a better-managed building envelope. Multiple regression with all variables realised that eight variables significantly explain 90.9 percent of the variation in the distribution of abandoned building in the urban space as illustrated by Model 2. Five of these variables have a positive or direct relation with proportion of abandoned building whereas the others have an indirect relation. Those with a positive relation are degree of adjacency and impermeability, percentage of space area with bare soil, percentage of space with steep slope, ratio of different building heights to the length of space and percentage of internal spaces fronting the space that are occupied by general retail shops.

The above scenario firstly, re-emphasises the significance of the fact that presence of human life is necessary for a thriving settlement and vice versa. Jacobs (1995: 199) concurs with this when he says that 'windows and/or doors give a sense of habitation and of other people nearby'. This is why the less the number of doors or windows and/or the far the space is from the front of building, the less the presence of human life and attitude to make it better, hence the more likelihood of neglect and hence the faster the rate of deterioration. A good environment for people needs to be physically acceptable, for instance, to be well paved or planted with grass or provided with facilities that can attract people, but not with bare soil and hardly any access to buildings. This is why successful town centre rehabilitation programmes have always involved the attraction of people back to the centre. Secondly, specialised shops cannot thrive in such areas thus leaving room for higher percentage of general shops. This is because the less the number of customers, the more general the shop and the better for its economic survival. This in a way supports the idea as to why coarse grain is preferred to fine grain, that is, the old and new, large and small should co-exist for the betterment of the urban environment.

Thirdly, the higher the variation in height levels implies that the original much lower and uniform height level has been disrupted by new developments. Redevelopment in city centres nowadays is driven by economic speculation and less of environmental concerns. This in turn replaces the residential spaces with high economic value activities like commercial and offices. Their effect is felt in the adjacent un-redeveloped buildings in terms of increase in rents, which in turn means more people per unit space or abandonment of the building altogether. All the same, the ultimate result is higher deterioration and eventual abandonment due to exploitation or neglect. Fourthly, topography is also essential for access and other human activities around buildings. This is why buildings or parts of buildings bordering steep slopes were found neglected and abandoned (Fig. 4). Therefore, proper positioning and orientation of buildings is necessary.

Figure 4: *A non-constituted and segregated urban spaces (LA3) experiences high rate of Abandoned buildings.*

On the other hand, variables that were found to have an indirect or negative relation with the dependent variable are percentage of pavement that is straight, intensity of windows and shops operating duration per day. This means that the more the windows per unit areas of space, the longer the operating time of shops and ability for one to see other spaces from the space, the less the neglect and abandonment of buildings bordering the space. This re-emphasises the need for constitutedness of space, sense of belonging, and visibility, that are very important for attraction and retention of human beings in the space and hence the resultant need or creation of a better environment.

Modelling incomplete facades

Incomplete facades was measured as a ratio of number of buildings with no wall finish done on their walls fronting the space to the total number of buildings fronting the urban space studied.

Model 3 illustrates a multiple regression relation between percentage of incomplete facades fronting the space and alpha variables that reveals the three variables significantly explain about 44.6 percent of the variation in the dependent variable. These variables are relative depth of axial spaces, degree of adjacency and impermeability, and axial connectivity. An increase of the former two implies an increase in proportion of incomplete facades, whereas an increase of the latter implies a decrease in proportion of incomplete facades thus the better the urban space definition and environment.

Multiple regressions between percentage of incomplete facades and all variables reveal that nineteen variables significantly explain about 99.6 percent of the variation in the dependent variable. This is illustrated in Model 4. Out of these variables, seven have a positive relation and the rest a negative relation with proportion of incomplete facades. Those with a positive relation are length of block of buildings, percentage of space with bare soil, ratio of different building heights to the length of space, depth of space from carrier space, percentage of spaces occupied by hardware shops fronting the space, percentage of cars parked by residents, and permeability per unit area. An increase in any of these variables holding the others constant means an increase in proportion of incomplete facades fronting the space.

Those with a negative relation are shops operating duration per day, intensity of foul manholes, percentage of space that is flat, width of block of buildings, percentage of pavement that is straight, percentage of internal fronting spaces occupied by bookshops, plot ratio, percentage of adjacent indoor spaces selling electric goods, intensity of artificial lighting in the space, percentage of road that is smooth, frequency of intersections in the space, and percentage of adjacent indoor spaces accommodating residential activities. An increase in any of these variables holding the others constant means a decrease in incomplete facades fronting the space.

Modelling quality of buildings

Quality of buildings in this case was measured qualitatively on a scale of 1 to 5. Numeral 1 represents a building envelope in a good condition whereas numeral 5 represents a decayed condition. A decayed condition indicates the attitude of the developer or the user towards that building façade in relation to the urban space being studied.

Multiple regression between quality of buildings fronting the space and alpha variables revealed that two variables significantly explain about 47.4 percent of the variation in the dependent variable as illustrated in Model 5. These variables are degree of adjacency and impermeability and permeability per unit area. An increase of these variables implies an increase in worsening of quality of buildings, which in turn implies a worsening insecurity situation, quality of defined urban space, and general urban environment. Impermeability simply segregates people from the space whereas permeability per unit area refers to too narrow spaces that are not appropriate to the culture and context. In both cases such kind of spaces end-up being put into ill uses that are detrimental to the environment. This calls for usable spaces and more interaction between internal and external spaces.

Multiple regression between quality of buildings and all variables revealed that eleven variables significantly explains about 93.3 percent of the variation in the dependent variable as illustrated in Model 6. Out of these variables, three have a positive relation and the rest a negative relation with quality of buildings.

Those variables with a positive relation are percentage of space with bare soil, presence of bus stops, and degree of adjacency and impermeability. An increase in any of these variables holding the others constant means an increase in the worsening of quality of buildings fronting the urban space. This implies that the poor quality of construction of the space itself, the abuse of the space by public transport, and the lack of interaction between outside and inside contributes a great deal to the economic well-fare of the buildings. If the situation is that the building cannot supply a quality of environment that can attract high rents, clientele, and customers and hence income, then its statues is bound to continue deteriorating due to none maintenance. This is common with eastern CBD, where restaurants, lodgings, and butcheries have to sale their commodities at almost half

Percent of buildings with incomplete facades = -0.738 + 34.9S_{25} + 0.027S_{16} + 0.012S_{18} +/- 0.162 δ

Model 3

Percent of buildings with incomplete facades = - 0.05132 + 0.001E_{17} + 0.003B_{16} + 1.12E_{31} 0.012$_{51}$ 15.9F_{33} + 0.030S_{24} + 0.0008G_{23} + 0.0008B_{30}+ 0.002E_{75} 0.0008D_{16} + 0.009G_{28} 0.023G_{15} 0.003G_{60} + 0.154D_{63} 1.08F_{32} + 0.0002D_{24} + 3.76S_{27} + 0.753D_{18} + 0.002G_{26} +/- 2.622 δ

Model 4

Quality (maintenance and cleanliness) of buildings = 1.734 + 0.197S_{16} + 86.5S_{27} +/- 1.033 δ

Model 5

Quality (maintenance and cleanliness) of buildings = 4.662-1.32G_{47} - 0.039G_{34} - 0.101G_{51} - 0.035E_{28} + 0.008B_{16} + 0.805D_{34} - 0.088G_{30} + 0.604E_{48} - 0.032B_{14} - 0.030G_{33} + 0.054S_{16} +/- 0.423 δ

Model 6

the price sold in western CBD in order to attract customers, thus making very minimal profit. A general observation indicates that most of buildings with such businesses remain un-maintained. One of the city hall planners noted that this is due to change of ownership and use of buildings from Indian residential to African commercial; absenteeism of (African) landlords; lack of professionalism in their businesses that actually renders them economically not viable; insistence of city hall for serving of shops from service lanes, which actually does not happen. This reveals that urban design in Nairobi remains stack to the 1920s ideas whereas the situation on the ground is not appropriate. It is this conflict that is causing some of these problems.

Those independent variables with a negative relation are percentage of buildings wholly or partly used by landlords, presence of other shops, library, fast food vendors, and showrooms fronting the space, operating duration of shops, most number of building storeys fronting the space, percentage of space with grass. An increase in any of these variables holding the others constant means an increase in quality of buildings fronting the space. This indirect relation agrees in part with the argument that construction level of the space and the location of landlord's residence influences the status of the building. Secondly, accommodation of a variety of uses including special community oriented activities in the building thus improving its economic situation (Fig.5). This must be accompanied with a sustainable or humane environment otherwise customers and tenants are bound to run away. Therefore, economic situation of the building goes hand in hand with its maintenance.

These findings suggest that, constitutedness of space, land use, land value or height or plot ratio or density or massing value of the area, distribution of open space/grain in the urban system, segregation and integration of space, hierarchy of open space, distribution of common facilities, distribution of use in an urban space, use and construction of urban space, and scale or proportion of space are some of the urban patterns that could be used to control quality of buildings fronting urban space.

Figure 5: *opening of business in formely non-constituted urban spaces(LA9) revitalises the urban environment.*

Model	Degrees of freedom	R^2	$F_{calculated}$	$F_{tabulated}$ at 95% level	$F_{tabulated}$ at 99% level	Hypothesis testing at 95%	
						Null	Alternative
1	1,38	.558	47.973	4.098	7.360	Rejected	Accepted
2	8,31	.909	38.707	2.261	3.152	Rejected	Accepted
3	3,36	.446	9.6607	2.892	4.390	Rejected	Accepted
4	19,20	.996	262.10	2.136	2.970	Rejected	Accepted
5	2,37	.474	16.671	3.257	5.243	Rejected	Accepted
6	11,28	.933	35.446	2.160	2.965	Rejected	Accepted

Hypothesis Testing

Hypothesis testing involved comparison between calculated and tabulated values of the F-Ratio for all the established relation. It was realised as illustrated in Text Box below that the calculated F-Ratio for all established relations exceed the tabulated F-Ratio at 95% confidence level. This means that the null hypothesis is rejected in all cases and instead the alternative hypothesis accepted. This research therefore concludes that a relationship exists between urban spatial pattern; and dereliction and decay of built environment in city centres.

6. Discussion

The urban design variables established earlier in this paper mainly highlights the patterns that relate to constitutedness of space, integration or segregation of space, land use, distribution of common facilities and construction of urban space as major patterns that could be incorporated in design of urban space to attract people back to city centres in order to restrain the ultimate decay of built environment.

Diverse uses enliven the area and the street, bring different people for different purposes, and help to keep it going'. Therefore, issues like massing, plot ratio and height that play a lot in shaping the urban block should be geared towards encouraging humanisation of urban space.

It is clearly evident that human amenities or in other words common facilities, for instance, pavements, telephone booths, bus stop shelters, display lighting, outside seating, canopies, fast food vendors, newspaper kiosks, and display and exhibition structures do encourage economic and social activities. This implies that construction of urban space is also vital for the humanisation of the space and ultimate care for the capital assets.

7. Conclusions

This research has realised that impermeability of urban blocks, long urban blocks, poor external environment of the space, narrow spaces, locating of urban spaces deep in the settlement, lack of proper landscaping of urban spaces and lighting, lack of economic activities that attract a variety of people and absence of landlords highly contributes towards degradation of external envelopes of urban blocks. All these issues have a lot to do with the ability of people or the pedestrian for that matter to use the space adjacent to the buildings in question. This therefore strongly indicates that humanisation of urban space is necessary for the up-keep of the capital assets associated with it and ultimately their sustainability. However, for this to happen, the space needs to be constituted, integrated, controlled in an appropriate scale, with proper construction, supplied with common or human amenities and located within a heterogeneous surrounding. Therefore, in the design of any settlement, it should be made clear that these findings are put into consideration in planning and designing urban space structure.

8. References

Anderson, S. (ed.) (1986) *On Streets.* Massachusetts: The MIT Press.

Barnett, J. (1982) *An Introduction to Urban design.* New York: Harper & Row, Publishers.

Brambilla, R. (list all authors) (1977) *For pedestrians only: Planning, Design, and Management of Traffic-free zones.* New York: Whitney Library of Design.

Broadbent, G. (1990) *Emerging Concepts in Urban Design.* London: Van Nostrand Reinhold International.

Gallion, B. & Simon E. (1963) *The Urban Pattern: City Planning and Design*. Princeton, New Jersey: D. Van Nostrand Company.

Gehl, J. (1996) *Life Between Buildings.* New York: Van Nostrand Reinhold Company.

Hillier, B. & Hanson, J. (1984) *The Social Logic of Space.* Cambridge: Cambridge University Press.

Hillier, B. (1996) *Space is the Machine.* Cambridge: Cambridge University Press.

Hornby, S. (1995) *Oxford Advanced Learner's Dictionary (5th ed.)* Oxford: Oxford University Press.

Jacobs, B. (1995) *Great Streets. Massachusetts:* The MIT Press.

Jacobs, J. (1961) *The death and Life of Great American Cities.* London: Jonathan Cape.

Krier, R. (1991) *Urban Space.* London: Academy Editions.

Krier, R. (1993) *Architecture and Urban Design.* London: Academy Editions.

Lozano, E. (1993) *Community Design and the Culture of Cities: The Crossroad and the Wall.* Cambridge: Cambridge University Press.

Lynch, K. (1971) *Site Planning.* Cambridge, Massachusetts: The MIT Press.

Malt, L.(1970) *Furnishing the City.* New York: McGraw-Hill Book Company.

Moirongo, O. (1999). *Urban Space Design and Space Environmental Management. A Study of Nairobi City Centre-Kenya.* Unpublished PhD Dissertation.

Parfect, M. & Power, G. (1997) *Planning for Urban Quality: urban design in towns and cities.* London and New York: Routledge.

Salvatore, D. (1982) *Theory and Problems of Statistics and Econometrics.* New York: McGraw-hill Book Company.

Spreinegen, P. (1965) *Urban Design: The Architecture of Town and Cities*. New York: McGraw-Hill Company.

Trancik, R. (1986) *Finding Lost Space. Theories of Urban Design.* New York: Van Nostrand Reinhold.

Worpole, K. (1992) *Towns for People: Transforming Urban Life.* Buckingham: Open University Press.

Appendix 1:
Regression Analysis for Dereliction and Decay of Built Environment in Urban Space.

Var.	r	R^2	Uns. B	SE B	ß
Model 1: % of abandoned buildings with Alpha Variables (M50)					
S16	.747**	.558	.053	.008	.747
Constant = 0.05112, S_e =. 182, Adjusted R^2 =. 547, F = 48.058					
Model 2: % of abandoned buildings with all variables					
S16	.747**	.558	.024	.006	.341
B16	.704**	.647	.004	.001	.568
B33	.210	.716	.005	.001	.309
E31	.191	.781	.912	.441	.121
G22	.030	.822	.011	.002	.265
D16	-.513**	.868	-.002	.000	-.240
E35	-.011	.888	-.323	.113	-.190
G51	-.213	.909	-.009	.003	-.149
Constant = 0.192, S_e =. 0917, Adjusted R^2 =. 891, F = 38.689 = 38.689					
Model 3: % of building with incomplete facades with alpha variables (M51)					
S25	.448**	.201	34.9	8.72	.736
S16	.429**	.365	.027	.007	.499
S18	-.227	.446	.012	.005	.435
Constant = -0.738, S_e =. 162, Adjusted R^2 =. 399, F = 9.645					

Var.	R	R^2	Uns. B	SE B	ß
Model 6: Quality (maintenance & cleanliness) of buildings with all variables (M52)					
G47	-.602**	.362	-1.32	.204	
G34	-.347*	.565	-.039	.006	
G51	-.362*	.681	-.101	.016	
E28	-.437**	.764	-.035	.011	
B16	.598**	.812	.008	.003	
D34	.085	.842	.805	.233	
G30	-.193	.866	-.088	.028	
E48	-.109	.886	.604	.272	
B14	-.331*	.901	-.032	.011	
G33	-.318*	.921	-.030	.011	
S16	.576**	.933	.054	.024	
Constant = 4.662, S_e =. 423, Adjusted R^2 = 907, F = 35.562					

Names of significant variables

S16 = Degree of adjacency and impermeability
S18 = Axial connectivity
S24 = Depth of space from carrier space
S25 = Relative depth of axial spaces
S27 = Permeability per unit area
B14 = % of space with grass
B16 = % of space area with bare soil

Model 4: % of buildings with incomplete facades with all variables (M51)

E17	.730**	.532	.001	.000	.494
B16	.724**	.723	.003	.000	.545
E31	.176	.799	1.12	.115	.194
G51	-.232	.847	-.012	.001	-.263
F33	-.060	.890	-15.9	1.23	-.247
S24	.204	.914	.030	.004	.138
G23	.436**	.932	8E-04	.000	.113
B30	-.093	.948	8E-04	.000	.205
E75	-.078	.958	.002	.000	.187
D16	-.342	.966	-8E-04	.000	-.151
G28	-.163	.973	.009	.001	.190
G15	-.361*	.981	-.023	.004	-.128
G60	-.119	.984	-.003	.001	-.131
D63	.010	.987	.154	.044	.092
F32	-.145	.990	-1.08	.237	-.089
D24	-.293	.992	2E-04	.000	.054
S27	.215	.994	3.76	.912	.110
D18	-.150	.995	.753	.229	.071
G26	-.126	.996	.002	.001	.052

Constant = -0.05132, S_e =. 018, Adjusted R^2 =. 993, F = 274.28

B30 = % of space that is flat
B33 = % of space with steep gradient
D16 = % of pavement that is straight
D18 = Frequency of intersections in the space
D24 = % of road that is smooth
D34 = Presence of bus stop
D63 = % of parked autos owned by residents
E17 = Length of block of buildings
E28 = Most number of storeys fronting the space
E31 = Ratio of no. of different heights to the length of space
E35 = Intensity of windows
E48 = Presence of fast food vendors adjacent to the space
E75 = Width of block of buildings
F32 = Intensity of artificial lighting fixtures
F33 = Intensity of foul manholes
G15 = Plot ratio
G22 = General retail shops as % of shops fronting the space
G23 = Hardware as % of shops fronting the space
G26 = Residential space as % of spaces fronting the space
G28 = Bookshops as % of shops fronting the space
G30 = Library as % of shops fronting the space
G33 = Showrooms as % of shops fronting the space
G34 = Others as % of shops fronting the space
G47 = % of buildings wholly/partly used by landlords
G51 = Duration shops operate per day in hours
G60 = Electric goods shops as % of shops fronting the space

Model 5: Quality (maintenance & cleanliness) of buildings with alpha variables (M52)

S16	.576**	.332	.197	.044	.539
S27	.432**	.474	86.5	27.3	.379

Constant = 1.734, S_e =1.033, Adjusted R^2 =.446, F = 16.688

** p .01, * p .05, Uns. B = unstandardised coefficient, r = correlation coefficient, SE B = standard error of B, R^2 = coefficient of determination, S_e = standard error of the model, = standardised coefficient, F = Analysis of Variance coefficient.

The Challenges Associated with the Conservation of Historic Buildings and Collections: The Karen Blixen House

***Ephraim W. Wahome & Anne-Marie Deisser**

Received 24 August 2005; received in revised form 3 May 2006; accepted

Abstract

This paper is based on a condition assessment survey of a historic house and museum, Karen Blixen. The aim was to assess the potential risks that historic buildings are exposed to through external and internal forms of aggression. The study revealed that the building suffers structural problems that need urgent attention if it is to continue serving an important role as part of the Kenyan cultural heritage. It was further observed that some basic housekeeping policies should be instituted in order to control the rate of deterioration on the collections. This paper raises a series of conservation issues and makes recommendations that should be discussed and worked out in a collaborative manner by the various stakeholders.

1. Introduction

This paper discusses the role of conservation in the management of historic buildings and their contents. It emerges from a preventive conservation programme conducted by the authors in July 2005, with the aim of training twelve museum professionals from the National Museums of Kenya (NMK). In order to introduce the participants to the many aspects of preventive conservation and condition assessment, the authors selected Karen Blixen Museum (Fig. 1) as a case study. The choice was motivated by the size of the building to be assessed as well as by its content (collection) and setting (landscape).

The Karen Blixen House represents features and conservation issues that are common in historical houses and landscapes. The study focused on the identification of the Museum's environmental conditions including the building's collections, interior and exterior features. The issues explored included structural condition, light, relative humidity, temperature, pest, pollutants and the surroundings. The idea was to draw a series of best practices in the conservation of historic buildings, which forms the core of this paper. The objectives of this study was defined as follows:

- To carry out a condition assessment of Karen Blixen Museum
- To carry out a condition assessment of materials on display at the museum
- To identify key present and future threats to the museum and its collections
- To make suggestions on future preventive or interventive treatments

The museum is named after a famous colonial writer, Karen Blixen. Karen Blixen was born in Denmark in 1885 and moved to Kenya during the Second World War in 1914. She purchased what came to be known as Karen Blixen house in 1917 as part of a big chunk of land including the present day Karen Estate on the southern side of Nairobi. The house was built in 1910 and is separated from Nairobi's Central Business District (CBD) by a patch of dense but fast disappearing woodland. The house is located about 15 km from the City centre. Karen lived in the house from 1917 to 1931, when she sold the house and returned to her home country, Denmark. The house therefore represents the old colonial ways of early settlers in Kenya and serves as a museum in the postcolonial era. The Museum receives a large number of local and international visitors, as Karen Blixen is well known for her life and writings, which epitomise the spirit of colonial adventure and aristocratic lifestyles. Her classic book, Out of Africa, is a good example which is universally read. The controversies associated with such writings make her work even more interesting (Wa Thiong'o, 1981:16; Johanneson, 1961:131-134).

After independence, the Danish Government donated the house to the Government of Kenya as a gift. The house and the surrounding gardens became part of the National Museums of Kenya (NMK) in the 1980's. The Danish Government and the NMK restored it during the filming of 'Out of Africa'. The process involved the restoration of its original appearance and furnishings, which have become the main attraction for most visitors. After restoration,

** Ephraim W.Wahome is a lecturer in the department of history , University of Nairobi/ Ann- Marie is a conservation Consultant. P.O.Box 30197-00100, Kenya.*

Africa HABITAT Review 1(2006)

the house was opened to the public in 1986 as a museum.

The gardens have also retained their original form in spite of constant change of ownership through time. This indicates that the different tenants who have occupied the house at one time or another have paid a lot of attention to the garden's botanical aspects and landscaping.

The collection of artefacts and furniture in the house portrays the daily life of Karen Blixen. In addition, the family of Karen Blixen has presented the NMK with a lot of interesting photographs, which depict her social life and status. Most artefacts are on open display. The 'exhibit' aims to show the house as it was when inhabited by Karen Blixen. The office part of this historic building seems busy with letters and books on the desk and library shelves. The kitchen displays the equipments used for cooking then, providing an idea on the simplicity of the utensils compared to the sophistication of the same objects today. The bedrooms seem to have been well maintained by their occupants while boots and clothes are abandoned on the chairs and sofa set. Perfume and readings are sitting on the night table.

The environment seems frozen in time since 1931. The house is a well-proportioned building with square, wood partitioned rooms and wooden floors. All window frames and doors are made of painted wood. The roof is built with tiles and a veranda with a flat roof run along the main entrance façade. The original main entrance is not used. Visitors are directed on the house side where the Museum entrance and ticket desk are set up. A gift shop is built as a temporary structure on the veranda, outside the house. The entire house is not opened to the public, as curatorial offices and storage occupy some rooms of the original living space. Despite a series of transformations, the interior fittings and layout of the Karen Blixen House have survived largely intact. Clearly, the site, the exterior and interior of the building, and the collection are intact. Structural problems identified on the exterior part of a house are nowadays considered to be the main source of degradation for its interior and contents (collections). While there is need for accurate diagnosis of the underlying problems by a structural engineer, there is also an urgent need for identifying the interior and exterior causes of material deterioration and damage through condition assessment.

In this regard, the conservator's role is to enable contractors to acknowledge the vulnerability of historic buildings and to distinguish between the repair and conservation skills required (see Viñas, 2005: 9-10). In addition, there is need to identify and provide guidance on methods and materials that are suitable in the protection of interiors and collections during the restoration of the historic buildings.

Holistic management of historic sites, buildings and collections requires the combined effort of architects and conservators. This calls for the re-examination of both professions in the planning of restoration work and draft specifications. It also requires conservators and architects to consult extensively and to communicate and explain what they are doing to the public and related professionals.

2. Legal and Conceptual Issues

The Karen Blixen Museum qualifies to be classified as a monument of historical interest according to the Antiquities and Monuments Act Cap 215 (ROK, 1984:5). According to this Act, a monument is

> ***A place or immovable structure of an age which, being of historical interest, has been and remains declared by the Minister under section 4 (1) (a) to be a monument, and includes the site thereof and such adjoining land as may be required for maintenance***

An object of historical interest is any object that came into existence after the year 1800 where Karen Blixen building falls. On the other hand, an object of archaeological or palaeontological interest came into existence before 1800. Such an object can be in private or public land but under the protection of the Museums of Kenya. Being a manifestation of the colonial legacy and the legendry Karen Blixen's life, the building deserves conservation as a monument of historical interest. The land on which such a monument stands is classified as a protected area and therefore entitled to continuous care and protection from the vagaries of nature or human

encroachment and vandalism. Any other specified place or immovable structure considered to be of historical interest and gazetted by the Minister of National Heritage is also protected under this act.

Protection or preservation of monuments involves a number of areas including the physical inspection of the monument for stability, occupancy, use and restriction or the right of the owner or occupier to "build or to do other acts or things on or near the site of the monument" unless authorised maintenance is the reason for such an action. In the case of Karen Blixen, such maintenance falls under the National Museums of Kenya which is the custodian of national heritage.

According to this Act, 'any person who destroys, removes, injures, alters or defaces or does any act that imperils the preservation of a monument is guilty of an offence and liable to a "lenient" fine of not exceeding ten thousand shillings or to imprisonment for a term not exceeding six months or to both'. Overall, a monument that is currently owned by the National Museums Board should be properly maintained by taking actions that may be deemed necessary for the survival of the monument. The Minister of heritage may also "prohibit or restrict access or any development thereof, or the use thereof for agriculture or livestock, or any other activity thereon which in his opinion is liable to damage a monument" (ROK, 1984:11).

Museums require at least a minimum level of care and security for both the building and collections (Liston, 1997). This calls for proper identification of universal cultural security needs of the building and collections including fire security, and emergency preparations besides common sense steps for security and accountability (Liston, 1997). A comprehensive analysis of all aspects of fire protection including disaster planning, prevention and recovery, and building design considerations (Wilson, 1995) must be in place to ensure safety. This means that a museum should have clear policies and guidelines to protect its staff and objects from unwarranted threats. Most artefacts in historic houses are made of natural organic materials: wood, leather, traditional adhesives (rendered down animal or vegetable matter), natural textiles, paper products, fur, bone, and ivory (Brown and Rose, 1996). A number of inorganic and composite materials are also represented. The reaction of the materials to relative humidity, temperature and light varies considerably (Read, 1994) depending on many factors like the nature of raw materials used as well as the manufacturing process. For the building itself, its former function and maintenance schedule to determine its ability to resist attrition. In view of this,

> ***"It is important to consider carefully the preservation requirements of both the collection and the building when setting specific temperature and relative humidity standards and designating climate control systems"***
> *(Kerschner, 1992).*

A good museum must maintain humidity levels within a range that does not lead to embrittlement or encourage mould growth. The recommended relative humidity (RH) levels range between 30 to 70% (Brown and Rose, 1996; Michalski, 1993). A strict range of between 40 and 60% is used by most museums to minimize biological attacks, mechanical damage and efflorescence of common salt (Erhardt and Mecklenburg, 1994; Stolow, 1987:37). In spite of this, a degree of commonsense approach, particularly if mechanical humidification is beyond the financial capability of the institution, should be adopted. For example, condensation of widows is a clear sign of high RH. It is also important to note that moisture problems in historic buildings emanate from 'roof leaks, damaged gutters and down spouts, poor surface drainage of rainwater, and wet basements and crawl spaces' (Brown and Rose, 1996) which can be easily repaired as part of preventive conservation. Proper maintenance of such features can control the hazards related to RH fluctuations and rising dump considerably. Brown and Rose, (1996) further observe that relative humidity is elusive because temperature variations may be caused by radiant heat from direct sunlight or incandescent light sources (also see Read 1994). Other hazards associated with collections include light damage, exposure to gaseous pollutants, pests and physical damage from handling, inadequate support, vibration and transport (Nicholson: 1992) besides fluctuations of temperature and RH. Proper

Africa HABITAT Review 1(2006)

house keeping should be used to control such hazards significantly.

According to Read (1994), a good museum building is:

- Well-drained, well-insulated, water-tight and with a damp-proof course
- Pitch roofed, with few windows and rain water disposal systems
- Characterized by ease of access and appropriate environmental zoning.
- Stable and moderate in terms of relative humidity & temperature
- Equipped with a disaster and recovery plan

However, poor communication, lack of continuity, too long a chain or red tape, poor foresight and lost improvement (McCord, 1992:102) are the main challenges to preventive conservation in most museums. The study of Karen Blixen House was conducted with this broad framework of preventive conservation in mind.

3. Methodology

To achieve these objectives set out in this study, the research involving a combination of interviews and observations, was conducted. All Karen Blixen museum employees, both curatorial and maintenance were interviewed. The study also identified materials, condition grades and treatment for all building features and ethnographic materials on display at the museum. The data was mainly qualitative and aimed at identifying the presence and/or absence of deterioration signs (see Figs. 1-8).

Description of Objects

The materials on display were described according to a number of characteristics including their origin, date of acquisition, object number, location (case number) and description (object name). The materials were also described according to their organic (plant, animal or other organic products) or inorganic (stone, clay, metals and non-metals) components.

Description of Damage

The study also involved the identification of general terms to describe damage on objects (Table 1). The terminologies used to describe damage in this study were primarily based on earlier surveys conducted by the authors at the National Museums headquarters (Nairobi Museum). The eight general terms used to describe damage were: major structural damage, minor structural damage, surface damage, disfigurement, chemical/internal deterioration, biological attacks, accretions and old repairs.

Description of condition grades

The definition of condition grades have been agreed as follows:

- Condition grade A (GOOD): Object in the context of its collection is in good conservation condition, or is stable.
- Condition grade B (FAIR): Fair condition, disfigured or damaged but stable, needs no immediate action.
- Condition grade C (POOR): Poor condition, and/or restricted use, and/or probably unstable, action desirable.
- Condition grade D (UNACCEPTABLE): Completely unacceptable condition, and/or severely weakened, and/or highly unstable and

Table 1: List of the terms used to Describe Damage

Type of Damage	Examples
Major structural	Separate pieces/part, loose cracks, major splits, large holes, large tear
Minor structural	crack, small holes, loose attachment, structurally weak, bent, warped
Surface damage	paint/surface losses, delaminated, dented, bruised, flaking, crazed
Disfigurement	scratched, stained, abraded, discoloured, tarnished, faded
Chemical/internal	crumbling, friable, desiccated, exudations, salt damage, acid dyes
Biological	insect attack, termite, rodent, mould, mildew, moth, woodworm
Accretions	dirty, greasy, surface salts, deposits, encrustations
Old repairs	adhesive, misalignment, staples, sellotape, patches, clumsy stitching

actively deteriorating, and/or affecting other objects; immediate action should be taken.

Description of Interventive Work Required

- This work also involved identification of future interventive work either as:
- Level 1: Surface cleaning
- Level 2: External support/mount (for structurally weak materials).
- Level 3: Wet or dry-cleaning
- Level 4: Interventive treatment (Humidification, consolidation, remounting, etc)

Physical Examination of the historic building

The Karen Blixen monument was examined for signs of deterioration which may impact on the building and its collections. The visual inspection of the building involved a critical survey of the following areas:

- Possible water infiltration areas like the roof, gutters and downspouts
- Function of building elements like doors, windows and chimney
- Exterior Materials like stones, bricks, mortar and timber
- Piping, plumbing, heating and cooling system
- Features like, soft wood and ceiling boards, paint, salt crystals, stains etc.
- Signs of infestation like animal droppings, holes, dead or living insects, powdery substances
- Trees and other vegetative debris around the base of the structure or in the gutters
- Condition of the interior spaces
- Is the building clean, cluttered stained or dirty?
- Housekeeping plan for all interior spaces
- Are hazardous materials and equipment properly stored?
- Hazards (natural or man-made) that threaten the preservation of
- Is the area subject to extremes or to sudden changes in temperature and relative humidity? · Maintenance of plumbing, electrical wiring, fire extinguishers and security systems
- Disaster preparedness and recovery plans

An interview was also conducted to determine whether other specialists such as historic building preservation architects or engineers had earlier identified other problems in areas like insulation of exterior surfaces, rising damp, metallic corrosion or general structural deterioration which might need further evaluation. It also became clear that the original building plans could not be traced. Information on damaged or threatened features was also documented on photographs (see Fig. 2 to 8).

4. Data Analysis

Building Features

Karen Blixen house (Fig. 1) is an old colonial building built of stone with a roof made of tiles and corrugated iron sheets. The windows have wooden frames and the doors are made of wood and glass. The house is generally a bungalow with basic components including bedrooms, kitchen, dinning and the library. The kitchen is separated from the main house and connected through a covered veranda. The front porch is flat and covered with corrugated iron sheets. Fourteen stone pillars support it. The house has a chimney which is partly broken.

In terms of construction, there is no clear separation between the dump course and the rest of the wall which exposes the building to water filtration. The situation is complicated by the encroachment of garden plants onto stonewalls. Climbers are also seen on some of the walls. Similarly, standing tree populations like cypress and uncontrolled woody tropical vines like bougainvillea (Fig. 8) dominate the landscape. Their boughs overhang the building and shed excessive leaves on the rooftop. In essence such leaves are detrimental to the proper functioning of gutters. Equally destructive are the roots of such plants.

On the inside, the front porch has conspicuous paving slabs while the interior has wooden partitions and soft board ceiling.

Building Condition

The general condition of the building can be described as fair. There have been attempts to renovate the building but there are obvious signs of neglect as well. For example, the blockage of gutters due to accumulation of leaves has led to damages like flaking of paints as water passes along the walls. Water stains are also evident on the face board of the building. There is evidence of active corrosion of the gutters and water pipes resulting from excessive

moisture levels. There are also cracks in the building resulting from poor roof drainage. Similarly, loose and broken tiles allow water into the building interior causing watermarks on ceiling boards. The cracks on the chimney also contribute to the entry of moisture into the building, which is likely to affect the artefacts in the museum.

`The walls of the building display major cracks giving an impression of structural instability, which is unsuitable for frequently visited public areas (see Keene, 1996: 11). The pillars also display structural instability due to visible cracks, which portend invisible deterioration.

The doors and windows are operable. However, some of the doors cannot be easily closed leaving openings that allow pests into the building. Similarly, some windows have loose connections. The use of wire mesh and metal grilles on some windows is an important security measure.

Overcrowding of electrical junction boxes and cables portrays a risky and dangerous environment for visitors. Such cables should be properly secured as part of disaster management strategy which should be adhered to strictly. Incidences of frequently blown up fuses in the building have been cited, which is indicative of potential future disaster.

Vegetation

Vegetation (Figs. 5 and 8) poses the greatest risk to the building both structurally and environmentally. Vegetative debris in this lush green environment has the potential of increasing structural instability and fanning fire should it start in the vicinity. Similarly, trees and vegetation attract and give pests free access to the collections besides an ideal habitat. Creeping plants penetrate the walls and windows paving way to moisture and insects. Patches of mosses and lichens (Fig. 6) on the façade portend deeper problems in the form of rising dump and progressive invisible deterioration.

The interior of the building is in a fairly good condition with an exception of the kitchen (Fig. 7), which has been infested by termites threatening to bring down the ceiling. Pest infestation appears to be a major threat to the kitchen interior and the risks associated could be disastrous given the large number of visitors attracted to the museum.

Besides termites, water leakage, seen in the form of watermarks (Fig. 3), is a major form of aggression on the ceilings. In the bathroom area, bathtubs and sinks show signs of cracking and discolouration indicating stress and exposure to varying moisture levels. Some of the door handles have also been exposed to corrosion.

Interior deterioration is related to external problems like attraction of pests by flowering plants, chimney leakage leading to water entry into the fireplace area and cracks on the exterior wall and poor drainage.

Inside the building, items are appropriately displayed including the dinning table, bed, cutlery and furnishings. The library with its many books and

Fig. 1: The Karen Blixen Site

Fig. 2: Front Outer Wall and Garden

Fig. 3: Outer Porch Ceiling

Fig. 4: Roof and Clock

Fig. 5: Gutters

Fig. 6: Side Outer Wall

pest infestation. However, some of the photographs are fading due to continued exposure to light. Curtains are effectively used to reduce the entry of light into display areas while giving the house a homelike environment. There is a routine housekeeping programme, which seems to work, though dirt and dust need to be controlled through the use of a vacuum cleaner. There is evident pest infestation of animal skin materials which served as carpets in the bedrooms. There is an urgent need to fumigate and quarantine the materials to deter this kind of biological threat. Hazardous materials like paints and bleaching agents in the kitchen pose a serious risk that should be addressed as a way of averting potential future disaster.

Pollutants

The building is located in a good environment covered by lush and luxuriant vegetation, which is a fair representation of the Karen Estate. No harmful substances like gases, dust and smoke are apparent and pollutants are generally not a major threat to the building and its contents unless fumigation is used. However, tree pollen should be guarded against as a potential form of pollution. In spite of these advantages proper house keeping and the use of a vacuum cleaner would help control cumulative dirt and dust.

Light

The sources of light illuminating the collections include natural light through the windows and artificial electric light in the form of bulbs and fluorescent tubes. Electric light bulbs are usually mounted on transparent lantern lamps. Such lamps are hung from the ceiling to provide light reminiscent of the lighting system, including street lighting, used in Nairobi during the early colonial days. In other instances

Africa HABITAT Review 1(2006)

Fig. 7: Damaged Kitchen Ceiling Building Interior

Fig. 8: Bougainvillea on Walls

shades are used to reduce the intensity of light emanating from the bulbs. No screening materials or shields are used on windows or fluorescent tubes to reduce the levels of UV radiation. Generally, illumination is not properly monitored and equipments for this are not available at the museum. However, light is turned on between 8am and 6pm giving the materials ample time to recoup from the daily exposure. Visitors are not allowed to take photographs of the collections as a way of reducing light exposure Materials like blinders and curtains, which form an important part of the furnishings, are also used to help reduce the intensity of light into the building. Generally, the lighting system is acceptable but should be regularly monitored, particularly in areas where photographs and artefacts made of organic material are exhibited.

Temperature and Relative Humidity

During this study, a number of readings were recorded (see Table 2). It is important to note that the readings were taken in the month of July when the temperatures are relatively cooler than the rest of the year. This implies that temperatures and relative humidity could increase significantly during the warmer periods. Since the museum does not have appropriate equipments for monitoring change, the potential for material deterioration is real. The variations in temperature primarily emanate from weather conditions as windows and exterior doors are occasionally opened and closed to provide the required amount of air circulation. No air conditioning system is used inside the building.

It is notable (see Table 2) that relative humidity remained fairly constant inside the building compared to the changes observed outside. Regular monitoring of the Relative Humidity and Temperature within the building would provide a comprehensive analysis of the environment from which a relevant and effective environmental policy could be drawn and implemented. With constant monitoring of the building, relevant analysis and effective recommendations important conclusions can be made and potential aggressors, in the form of relative humidity and temperature, controlled accordingly.

Pests

Pests are a major problem within and outside the building with a clear dominance of termites on

Table 2: Temperatures and Relative Humidity at Karen Blixen Museum

Inside the building		Outside the Building	
Relative Humidity variation	*Temperature variation*	*Relative Humidity variation*	*Temperature variation*
57%	24ºc	55%	21.7ºc (morning)
57%	21.9ºc	50%	25ºc (afternoon)
57%	24ºc	50%	19.6ºc (late afternoon)

Source: Research by authors

wooden structures. The kitchen serves as the main indicator of the damage caused by termites (see Fig. 7), as part of the roof is crumbling. There is also evidence of biological activity with potential aggressors including lizard, rodents and spiders . Droppings of rodents are evident inside the building. Proper housekeeping in the form of integrated pest management is not organised inside and outside the building. Moreover, objects are not treated or quarantined before entering into the collection. Fumigation is not carried out on a regular basis or when such incidences of infestation are observed. Likewise, doors and windows offer many cracks and openings from which pests can enter and develop within the chimney, ceilings and other part of the building suffering from damp conditions. This implies that monitoring of pest should be undertaken on a regular basis both inside and outside the building. Similarly, all objects should be treated before entering into the collection and windows should be secured against such agents. Fumigation should also be carried out when such incidences of infestation are observed. However, proper housekeeping in the form of integrated pest management is usually the most effective method of pest control.

Finally, freshly cut flowers are presented into the house as an element of decoration. The introduction of such flowers increases the risk of external biotic forms entering into the building. While food is not allowed into the building, the compound itself is frequently used as a picnic site. Proper garbage disposal methods are not maintained in order to keep pests away.

Therefore, this offers an ideal environment for pests to thrive in the compound and ultimately into the building. Finally, vegetation growth is not controlled in the close surrounding of the building, thus vegetation promotes additional forms of aggression like rising dump and mould growth.

The introduction of flowers into the building, which is currently the case, should be carried out under strict observation to reduce the incidence of external biotic forms into the building. Food should not be allowed into the building by all means and when handled outside the building, as the compound is an ideal picnic site, proper garbage disposal methods must be maintained in order to keep pests away. Proper landscaping and control of vegetation growth is an ideal way of controlling pests and reducing vegetation related forms of aggression like rising dump and mould growth.

5. Discussions and Recommendations

Some of the problems observed in this study relate to basic housekeeping and maintenance procedures which if properly observed would avert potential crisis. This would involve controlling relative humidity and temperatures, pollution, pests and general building repairs (See Plenderleith, 1959:15).

For the building to fulfil its role as a museum and a public place, there is need to consult a structural engineer for guidance, as some of the cracks observed portend disaster. As a facility which serves as an archive of historic evidence, exhibition and demonstration to the public (Keene, 1996:2), such a disaster should be avoided by all means. There is need to reconfigure the flat roof as it is a source of water infiltration that directly affects the building interior and its contents. The chimney and inoperable doors and windows should also be fixed to prevent pest infestation and insecurity. The broken tiles should be replaced as a way of controlling moisture in exhibition areas. This will also extend the life of ceiling boards and other wood based building materials which are hygroscopic and normally affected by water.

For proper monitoring of in-house environmental conditions appropriate equipments must be installed as a matter of urgency. The museum must at least have a thermometer for the documentation of temperatures, as fluctuations would impact negatively on the collections in particular and the building at large. A thermo-hygrometer would be needed too in order to take both temperature and relative humidity readings.

Furniture and artefact materials that have been affected by poor housekeeping procedures should undergo conservation treatment according to their condition. Quarantine regulations should be observed and deep-freezing facilities organised for infested artefacts. An ongoing corrosion of inorganic artefacts and building's fixtures must be contained

Africa HABITAT Review 1(2006)

through a combination of preventive and curative conservation.

The museum needs a storage facility to accommodate new collections or to retire old ones when need arises. It is important to emphasize that 'A museum which does not collect is a dead museum' (Wilson, 1989: 25). This also requires the establishment of quarantine space and deep-freezing facility. In this way, pest can be effectively controlled without necessarily interfering with the exhibition programme.

The museum needs a proper disaster management plan that accommodates fluctuations in weather conditions, the building structure as well as handling and disposal of hazardous materials. Similarly, fire extinguishers should be conspicuously located in the building and constantly inspected. Other considerations should include emergency contacts, in-house emergency supplies and disaster response teams. Such arrangements can be worked out with the blessings of the NMK headquarters. There is also need to contract a qualified electrical engineer to install new electrical cables in the building. This would help reduce fire hazards.

Proper maintenance of the Karen Blixen Museum (site, building and collection) should be given the attention it deserves. The museum should have a policy on the preservation of the building and its collections which does not compromise its beautiful surroundings. This can be achieved by consulting architects, landscape and interior designers, and conservators on adapted and effective preservation approaches.

In addition, some of the earnings from the museum should be set aside to employ a fulltime landscaper or a professional gardener, as the garden represents an important asset for the museum but a real threat to the building if not controlled and maintained on a regular basis.

The Karen Blixen House is a typical example of 'cultural property' or 'cultural heritage' that integrates movable and immovable features thus leading to confusion over responsibilities relating to its conservation. Indeed, the distinction between 'movable' and 'immovable' represents more than a problem of terminology for conservation professionals (Parrott 1991: 47). The Karen Blixen House is a clear case where artefacts, the buildings and its surroundings, create an entity that is more valuable in cultural terms than its individual components. In this regard, there is a need for an interdisciplinary approach between the conservators specialised in 'movable' and those in 'immovable' conservation. However,there is also a clear distinction, in professional practices, between conservation practitioners working on objects' conservation and conservators working on buildings' conservation. These two conservation fields often seem to be surprisingly distinct from one another. Most conservation practitioners are trained in the conservation of movable or immovable heritage. Subsequently, in the professional arena, they seem predisposed to work within the same partition, apparently ignoring the benefits of cooperation and exchange of expertise that preventive conservation, in nature, offers to both conservation fields. However, for the Karen Blixen Museum, the main issue in term of museum's responsibility lies in the absence of an institutional vision and mission statement.

Another issue seem to emanate from a failure to understand the cultural significance of the site and house heritage and to appreciate its value to cultural heritage professionals and local communities. If the necessity to take into account the cultural dimension in the overall development framework is recognised by cultural heritage organisations, it is more often theoretical than practical. It is therefore essential to innovate in the field of conservation development and promote original actions and examples of conservation management and practices that satisfy all partners involved.

At an economic level, the conservation of the Karen Blixen House is also important. For instance, the cultural and tourist sectors are closely related in this particular case. However, these aspects are not yet really considered as economic assets by the Kenya National Museum authorities. The traditional, sometimes unsustainable, view of museums as non-profit making institutions masks their apparent significance in the tourism sector of most developing

countries. Besides the prospect of international tourism, the house is located in a relatively affluent neighbourhood which, through sensitisation, could form the basis of domestic tourism.

At present, there is neither an institutional vision of conservation development and management, nor a detailed study of museology for the Karen Blixen Museum. A fuller intellectual partnership of conservators with museum directors, curators and scientists as well as inter-disciplinary discussions and respect for all museum disciplines would set conservation higher on museum agendas. From that perspective, a legal framework integrating conservation within museums' mandates and mission statements is critical. Moreover, the criteria for selecting and assigning conservation priorities, and methodologies for long term conservation planning and management, have to be developed. Nevertheless, this important task will require a lot of human resources and expert involvement. Overall, the challenge for the Karen Blixen House managers is to identify components of their culture that can be built upon to create greater synergy in the workplace as a result of working with, rather than against, widely held cultural norms (Ndoro, 2001: 20). Indeed, a lot can be done with very simple tools, the right attitude and adequate knowledge. In addition, when it comes down to actions to improve the conditions of a specific museum, there is much people can do without access to a great amount of funding. For many African museums, such an approach is 'inescapable' and somehow already an ordinary practice.

The Karen Blixen Museum constitutes an informative and educational bridge between the NMK professionals, architects, engineers, other academics, and with the public. In the context of its conservation, the collaboration of museum professionals with academics, architects and engineers presents a series of benefits too. Indeed, this partnership can prove to be the best way to generate a two way co-operation process in which all partners are learning from each other while working for the same goals.

6. Conclusions

From the analysis of cultural materials, it is apparent that Karen Blixen Museum is well maintained and the displays are good. However, the museum has a poor record in the protection of historic materials against biotic attacks as infestation of moth larvae and ants, clearly evident in the bedroom display and kitchen areas respectively indicate. The institution should make its fumigation program more regular while investigating alternative ways of dealing with the menace. A freeze-drying and quarantine facility would alleviate the problem and also play a crucial role in the event of a disaster like fire or floods. Other pests should be controlled through restricted access and a good housekeeping programme. Materials that have experienced biotic attacks are classified under condition grade D (UNACCEPTABLE), as they are severely weakened, and/or highly unstable hence requiring immediate action.

The study revealed that the general condition of the building is fair under condition grade B. This means that the building has undergone some disfigurement and damage but remains relatively stable. Although this condition does not warrant immediate action, the visual signs of damage may be indicative of deep-seated or invisible deterioration, which may need urgent professional guidance. This is particularly important as the building is a frequently visited public facility and the materials in it are priceless. The damages observed should also be repaired to forestall further deterioration. Regular maintenance of the building including clearing the gutters, trimming wild vegetation and climbers, controlling moulds and inspecting all water sources is a must if the museum is to continue playing its role of housing heritage and as a heritage object itself.

The current and future threats to the museum are intertwined. It is critical to note that the museum lacks a basic disaster plan, identifying primary hazards, potential contacts, prevention checklist and disaster response and recovery teams. For a small museum like Karen Blixen, having staff that is properly trained in disaster management could help avert future disasters. The location of museum in a lush green area and the global warming projections pose serious a challenge to the institution as fire becomes a potential threat. Similarly, biotic attacks could be propagated by global warming to constitute a formidable threat. This can only be averted through

Africa HABITAT Review 1(2006)

research integrated pest management programmes and a proper understanding of global warming scenarios and projections.

For the museum to survive, both as a monument and museum, some basis measures should be taken urgently to mitigate further deterioration.

7. References

Brown, J.& Rose W. (1997). "Development of humidity recommendations in museums and moisture control in buildings". Retrieved August 2005 from http://palimpsest.stanford.edu/byauth/brownjp/humidity1997.html

Erhardt, D. &. M Mecklenburg (1984). 'Relative Humidity re-examined', in A. Roy & P. Smith (eds.), Preventive Conservation: Practice, Theory and Research. Preprints of the Contributions to the Ottawa Congress, International Institute for the Conservation of Artistic and Historic Works (IIC), London, pp. 28-31.

Gardiner, G. (1996). The conservation survey: identifying preservation problems. Museum International, 190 (48): 55-58.

Johannesson, Erick. O. (1961). The World of Isak Dinesen. Seattle: University of Washington Press.

Keene, Suzanne. (1996). Management Conservation in Museums. Boston: Butterworth-Heinemann.

Kerschner, Richard L. (1992). "A Practical Approach to Environmental Requirements for Collections in Historic Buildings." Journal of the American Institute for Conservation 31:65-76.

Liston, David, (1997). Developing national and international standards for better cultural security. ICOM and the International Committee on Museum Security. New York: Routledge Inc.

McCord, M. E. A. (1992). "Preventive Conservation, A Holistic Approach". 3 colloque international de l'ARAAFU - Paris.

Michalski, S. (1993). 'Relative humidity: a discussion of correct/incorrect values' ICOM Committee for Conservation 10th Triennial Meeting Washington, DC, USA. Preprints, Vol. II, ICOM Committee for Conservation, Paris.

Ndoro, W. (2001). Heritage management in Africa. GCI Newsletter, 16 (3): 20-23.

Nicholson, C. (1992). "What Exhibits Can Do To Your Collection." Restaurator 133: 95-113.

Parrot, H. (1991). Moving movables-questions of context. Australia ICOMOS Historic environment, 8, (1&2): 47-52.

Plenderleith, H. J. (1956). Conservation of Antiquities and Works of Art. London: O.U.P.

Read, F. (1994) "Preventive Conservation". Retrieved August 2005 from www.meaco.com/preventiveconservation.htm

Rose, W.B. (1995). 'History of attic ventilation regulation and research', Proceedings of Thermal Envelopes VI, Oak Ridge National Laboratory, Oak Ridge.

Stolow, N. (1987). Conservation and Exhibitions, Butterworths, London.

Viñas, Salvador Muñoz (2005). Contemporary Theory of Conservation. London: Butterworth-Heinemann

Ngugi Wa Thiong'o, (1981). "Literature and Society". Writers in politics: Essays. London: Heinemann.

Wilson, J. (1995). "Fire Protection." In Storage of Natural History Collections: A Preventive Conservation Approach. Vol. I. Eds. Carolyn L. Rose, Catharine A. Hawks, and Hugh H. Genoways. Iowa City, Iowa: Society for the Preservation of Natural History Collections, pp. 57-72.

Wilson, Sir David (1989). The British Museum: purpose and politics. London: British Museum Publications.

Teaching History and Theory of Architecture Proposal for an Anthropological Approach.

***Kamau Karogi**

Received 12 October 2004; received in revised form 30 March 2005; accepted 22 February 2006

Abstract

The course in cultural anthropology taught to students of Architecture in University of Nairobi, has not proved sufficient to give students clear orientation in History and Theory of Architecture and therefore architectural design. As a consequence, the debate as to how History and theory of Architecture should be taught is still on. The paper attempts to highlight the pitfalls of traditional conception-perception duality where the architect conceives or generates design ideas and the critic perceives them through criticism. This argument produces the larger percentage of the reading material in architecture. The traditional role of the critic is to find out what architecture means largely from the intentions of the designer and as to whether the architecture, as an artifact, communicates them. In the African context, architects are continuously called to design for institutions which are new in the sense that they have only been articulated in a social or cultural form but not as buildings. This paper therefore attempts to sustain a debate on how architects can develop an architecture which is valid through its role in fulfilling social needs as well as conveying discernible meaning as artifacts.

1. Introduction

History of architecture has been the single must forceful vehicle through which a theory of architectural design has evolved. This has been inevitable because, other than futuristic proposals, buildings are only accessible for analysis after their fact, i.e. in history. The historical method of teaching theory of architecture has many problems, which will always recur in time so long as it is used without aid of other perspectives in architectural theory. Some of the problems include conceptual problems, eclecticism and denial of history.

2. Methodology

This paper is a product of the author's teaching of History and Theory of Architecture in both Bachelor and Masters Degree programs in the Department of Architecture, University of Nairobi. The author, through teaching, practice, field survey and exhibition of his and his students' work for the past 27 years, has formed these theoretical propositions based on the gained experience.

Review of published projects and the vast amounts of literature on History and Theory of Architecture has contributed to the search for meaning of Architecture in which the author is engaged in order to sustain the debate that forms the core of this paper.

3. Conceptual Problems

Because the architectural artifact was evolved in absence of the theoretician, the only value that comes from its analysis is the interpretation of the theoretician. The consequence of this is the lack of understanding of the human forces that were at play in conception of architectural artifact. If the architect or builder of the architectural artifact is distant from the meaning intended by the society the problem of interpretation is compounded. In other words, the process of design, which is so important in understanding a work of architecture or art in general, is not accessible to the historian or architectural theoretician. The historian has a problem of inaccessible statements of the Architect's intentions from a distant history and wrong interpretations of cultural values in the conception of designs for the more recent works.

Eclectism

Due to some of the problems rooted in the intentions of the architect, what may seem to value is the style of the building. If we take classical times for instance, other than a good description of what a Doric, Corinthian or Ionic column is, a historian may not quite understand the cultural significance of a Greek temple. In his “Meaning In Western Architecture”, Norberg- Schulz (1975) has made commendable

** Kamau Karogi a senior Lecturer in the Department of Architecture, University of Nairobi, P.O.Box 30197 Nairobi-Kenya*

effort in analysis of meaning in certain 'high' pieces of western architecture. His analyses are not exhaustive as his book was extremely ambitious and although commendable, gave very brief insights into each category of architecture.

Needless to say, he belongs to a rare group of theoreticians who have labored to provide insights into the meaning of architecture.

History of architecture has largely been accessible to us in styles. Consequently, the architect has not borrowed the profound meaning of history of architecture. History of architecture has largely been accessible to us in styles. Consequently, the architect has not borrowed the profound meaning history of architecture but rather styles in history of architecture. What has resulted is eclecticism under various titles such as neoclassicism, historicism and many others. In historicism, the historical models have been acknowledged and accepted as valid. Architects have attempted to produce historical monuments while solving architectural problems rooted in the present human condition.

Denial of History

Architects can deny history if a new technological innovation liberates them from the enslavement of history. This is very possible especially where a deep understanding of history and therefore meaning of architecture has not gained wide currency. Modern movement has the double tragedy of, on the one hand, leaning from history that was largely descriptive, that is, not deep in meaning and, on the other hand, a subsequent denial of this very lacking history.

This resulted in an empty and abstract architecture (Robinson 1986). By denial of history or a reaction against it, the architect is generally rootless because he is forced to use a fully conscious method of design.

The unconscious cultural component, which history may provide as a root, will be lacking. To illustrate the problems that a purely historical method has in teaching theory of architecture, we will briefly analyze the works of recent architectural masters who have been influenced by history of history.

Le Corbusier

Le Corbusier, (1891 1965), was gifted with an unusual capacity of distilling the essentials of form in history.

He understood monumentalism in history extremely well. His capital in Chandigarh was a phenomenal universal restatement of monumentalism in history. Viewed within the Indian context, however, one is bound to ask a few questions. For Corbusier, which history was relevant? Were his points of departure influenced by both cultural and historical considerations, there is no doubt he would have chosen to be influenced by the sensitive tactile details of the Indian temples or crystalline finish of Taj Mahal.

His conception of the capital would have been both Indian and monumental. Because of' his ego and personality, not to mention the liberating forces of reinforced concrete when observed in detail, buildings at the capital are brutal and impersonal. If put against other monumental achievements in India they would not stand to test.

Ironically, one notes that the domestic architecture of Corbusier in India not only articulates cultural value such as the agnostic nature of Indian religious and such as small nooks for meditation but also the

Convent of La Tourette, at Eveux-sur-Arbresle, near Lyon, France, 1957 to 1960: The finish on this building is raw concrete, brutal; the proportions echo the classical style; the first, second and third levels to the left have been fashioned as cells for the monks and this has been expressed in the form.

Notre-Dame-du-Haut, at Ronchamp, France, 1955: located on a hill .occupies a place of phenomenal presence. Its form and color establishes acoustic rapport with the surrounding. The internal light is so modulate to evoke spiritual owe. The form is different yet it borrows from church iconography.

First Unitarian Church at Rochester, New York, 1959 to 1967: Light is introduced from above through shafts creating an atmosphere of silence introspection and therefore prayer. It is built mainly of brick. The form is articulated to modulate and produce shadows to the external wall. In this way Kahn fulfilled his three constants: light is the giver of all presence by will, by law; turn from thought to feelings and; buildings should have an integrity founded on use of materials.

crystalline nature of surfaces dictated by use of the floor for sitting among other details. When one assesses his ecclesiastical architecture, one is overwhelmed by how deep his understanding of church space and the associated meaning of the church as an object were. Ronchamp and the monastery at La Tourette in France are cases in point. While Indian culture was alien to him, he belonged to the Western culture and was a Catholic. He gave correct interpretation of church space in both of these buildings and used his artistry to truly make the spatial experience congruent with the intentions - a rare achievement

The above examples show that Le Corbusier was no doubt an architect of rare talent but lacked an all-embracing theoretical framework that was culturally derived. Had he such a framework, his work would have been more consistent and the glaring errors such as in his urbanism would have not been the case.

Louis Kahn

Kahn was born in 1901 in Estonia (Russia). His parents migrated to the U.S.A. where he graduated in architecture from the University of Pennsylvania in 1924. From 1948 to 1975 he was a processor of architecture in both Yale and Pennsylvania. He was one of' the theoretician-cum-practitioner in the 20th century. He matured as an architect (in his 50s), and probably all the more reason why his contribution in architectural theory and practice is truly profound. His creative process and theoretical positions are so intertwined that they have come to be known as constants of his work, (Rommer Jahveri, 1977). The following discussion of a few constants of his work enables us to gain sufficient insight into his contribution to architecture.

Light is the giver of all presence by will, by law

Kahn demonstrated that in the design process the quality of spaces and buildings depend on the artful interplay between the material (stone concrete. bricks, etc.) and tile immaterial, for example light.

To do this, the materials and the immaterial have to be comparable. This is only possible on a phenomenological scale because they are both

concrete to our senses. That light is the giver of presence cannot be gainsaid. By will, he meant that it is accessible to us through our senses or it is sensible. By law he, meant that for it lo be effective, it has to have an order or geometry. Because geometry is not sensible, it is in the realm of the supersensible or law.

Sanctuary of Art

Through tills constant he demonstrated that man's desire to be is to express and the ambience of man's expressiveness is the sanctuary of art. Through this constant Kahn demonstrated that architecture is capable of standing on its own as a work of art or sculpture in space. Although different realms of artistic expression should stand alone, they should nevertheless inspire one another. Poetry of the romantic genre, for instance, can capture the mood of a natural space that is; Sight hearted, sacred or lonely. Creative architecture should, on the other hand, be able to replicate or at least be influenced by such spaces. Where this is possible, architecture and poetry bear an inverse relationship.

Turn to feeling and away from thought

In this constant he argued that the most important aspect of architecture are buildings in use. The feeling provoked in the process of use is of the essence. Thoughts lead to a fully conscious design method and the results are rationalized buildings. This constant suggests that architectural design should incorporate a retrieval of images and experiences in our subconscious in our subconscious if we have to design buildings with spatial experiences congruent to our expectation.

From the above we can observe that Kahn was a phenomenologist in the true sense of true word. Although, when critically appraised his constants have profound import to architectural thought, he did not attempt to evolve a holistic theory of architecture with man, in his entirety, as the center.

Robert Venturi

In his book, Complexity and Contradiction in Architecture (1977) Venturi Wanted to bring back richness of meaning and variety. He argued that architecture is the meeting point between outside and inside. That the main street evolved through

Vanna Venturi House, by Robert Venturi, at Chestnut Hill, Philadelphia, Pennsylvania, 1962: "Both and " the house is both symmetrical and asymmetrical. The plan is symmetrical, but the symmetry is distorted at times to accommodate the particular needs of the spaces. The varying locations and sizes and shapes of the windows and perforations on the outside walls, as well as the off-center location of the chimney contradict the overall symmetry of the exterior form; the fireplace-chimney and the stair compete for the central position.

accretion is more vital than the designed street. That richness of meaning is preferable to clarity of meaning. That he was for messy vitality over obvious unity.

In trying to adopt his theoretical position to his architectural work, Venturi is eclectical He borrows from history to be complex. His argument that architecture is the meeting point between inside and outside, for instance, does not explain the series of forces including cultural ones that are resolved at this meeting point.

On one side the fireplace distorts in shape and moves over a little, as does the chimney; the walls are layered for the enclosure yet punctured for openness in front and back. This occurs at the front center where the outside wall is superimposed upon the two other walls housing the stair. Openings of different sizes have been juxtaposed. Venturi discussed architecture as indifferent objects, (Tafuri 1976). As such the human content is not discussed to any depth. He is concerned with architecture as a work of art whose primary purpose is to express artistic vision of the designer and as such should be

judged as objects of high culture (Robinson, 1986) rather than artifacts, which participate in the dialogue of culture generally.

Alvar Alto

Alvar Alto was a Finnish architect who had long experience as a lecturer and a practicing architect in both the U.S. and Finland. He can rightly be called the father of modern Finnish architecture. In his critical appraisal of Modern Movement, Alvar Alto (1976) argued that except for isolated successes, modern architecture had failed in creating humane, diversified, sensorially rich and meaningful environment. He further observed that environment had unquestionably lost in variety, local character and sensorial content. That modern movement had accelerated the tendency towards universal, industrial rationalism, which resulted in utilitarianism and anti-humans architecture. Instead of being centers of human action and integration, cities have become causes of alienation and fragmentation.

His theoretical observations as summarized above were consistent with his work which was deeply rooted in cultural considerations as many of its characteristics demonstrate.

Alva Alto, Saynatsalo Village Center: The interior of the council chamber celebrates the aspirations of communal government with an emotive gesture in the form of timber roof trusses. The brick and timber roof trusses. The Brick and timber that forms the main building materials of the building was derived from the region. The fenestration deployed satisfy the two site conditions: the effect of the oblique vector and the south facing frontality induced by the slope. (Baker, 1989)

His work emphasized the tactile kinesthetic experience as ably demonstrated in Saynatsalo Village Centre with its use of brick and timber. He emphasized human consideration, empathy, as his Parmio Sanatorium. In this building he considered the position of use, that is, a parent lying on the bed. In this way Alto reintegrated man with architecture.

His creative process underlined synthesis or unification process where images are born from the sensual and plastic origin, and are achieved by the interaction of the conscious and the unconscious mind as opposed to the fully conscious process of the modern architecture. He was concerned with symbolic content of his buildings. In his words, he was '"searching for an architectural symbolism for contemporary democracy". There is no doubt that Alto's work was humanist but without a detailed analysis of the human condition, achievement such as his can only come from a master.

Herman Hertzberger

Herman Hertzberger (1976) in discussing his architecture introduced a new awakening in the relationship between man and architecture. He argued that the more involved person is with the forms and contents of his surroundings, the more those surroundings become appropriate to him. As be takes possession of his surrounding so does the surrounding take possession of him.

This reciprocal taking into possession of people surroundings should form the basic architectural design process if the environments we design are to be colored by people. In this way architecture will

Central; Beheer office complex in Appledom, Holland

Africa HABITAT Review 1(2006)

stimulate the individual user to reach optimal identity to the extent that space and the individual play reciprocal role and continuously affirm each other. He further argues that the creative process must seek to explore the architect's memory continuously in order to tap the richness of his experience, in other words to tap the cultural self of the architect. In this way the architect will no doubt direct his attention to collective memory, some of which is innate.

Precise, plural, and evocative solutions depend on how rich our images stored in our collective memory are. By architects continuously exploring their memory, a dialectical process is put in place whereby historical outmoded significant are let to fade into the background and new ones are added. In this way, a continuous thread between the past and the future is maintained.

One of the better known of buildings designed by Hertzberger is the Central Beheer office complex. In this complex, he displayed an unusual design for offices where the individual identity is emphasizes while a sense of being involved in the whole was retained. He further demonstrates that man must be the centre of architecture hence an anthropological approach. However, he does not propose an overall theoretical framework on how man can be accessible to architecture. For this task we must turn to a hybrid between an architect and an anthropologist.

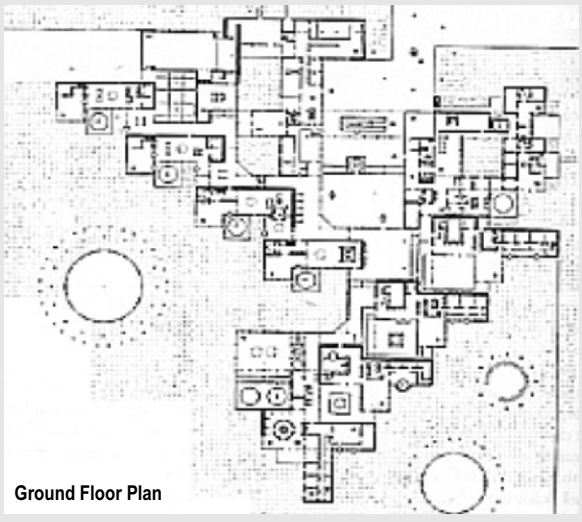
Aldo Van Eyck

Aldo Van Eyck is the Dutch architect, whose works and writings in the 60s and 70s have, as their theme, a response to the human condition. In discussing humanity versus architecture Van Eyck (1972) argued that architecture implies a constant rediscovery of constant human qualities as translated into space. The need to rediscover constant human qualities is persuaded by the fact that man is always and everywhere essentially the same. He argued that architectural space is the image of man as place and time in the image of man is occasion. What he meant by arguing that architectural space is the image of man is that since man in all his aspects represents the reality that motivates design, architectural space should be the counterform to man or his image much as clothing fits onto man.

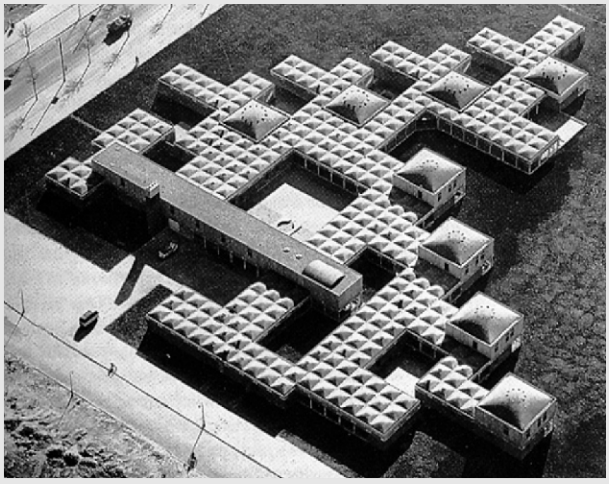
By arguing that architectural space is place and time he meant tat time creates the variations of mood of a designed place although dimensions of place are constant.

Time and place are correlatives and together are palpable as space that as we have seen is man's counterform or his image. By further arguing that space is occasion he means that space is only perceived when things are in motion within it. That man is the principal motivator of motion and therefore action in space. That action completes the conception of space because it brings about an occasion.

There cannot be space without an occasion otherwise it would be sterile. In this he demonstrates that man is central to architecture.



Ground Floor Plan



Amsterdam Orphanage

Another of his now famous dictum is the twin phenomena where he argued that architecture must answer to the problem posed by the individual person's space and the collective space of a group. This is a problem of scale, not in the empirical or Euclidian sense but in the social sense. Scale confers identity to space such that user or users colonize it unselfconsciously because it is right.

His design of the Amsterdam Orphanage aimed at creating a series of gathering spaces for children that comprised of graded courts of differing scales, different degrees of enclosure and openness, creating a street where it is possible to meet. The functions themselves underline the statement of the collective and the individual small scales, the graded transitions and the in betweens. He imposed am overall order by the structures, the elements of dome and cylinder, clerestory window, brick wall and door step which repeat throughout the project. In this project lie has illustrated some important points of his theoretical position. He clearly underlined the role of man and hence his study, anthropology as a basis for a creative process in architecture.

Corbusier, Kahn, and Venturi can, therefore, tie categorized as architectural masters who have made important contributions as far as the explicating of the architectural phenomena is concerned. They have failed, however, to discern the interactive process of architecture with man being at tile center. Their role in architecture has largely been analytical. Alto, Hertzberger and Van Eyck, however, belong to the category of architects who have embraced man as the center of architectural design and have succeeded with differing degrees in their efforts towards a humanist architecture. Their role has been both analysis and synthesis.

4. Conclusion

From the preceding discussions, it becomes clear that the more architecture embraces man or in other words cultural considerations, the higher its chances of success will be. As has been emphasized without a sound theoretical basis, which discusses man and his culture, only a few architects of rare talent will succeed in humanizing their architecture. In order that all architects have access to systematic exposition of the human condition, which would form a theoretical basis for design, below is a proposal for a revised approach in the teaching of history of architecture. The approach must include historical anthropology as a basis of understanding architecture as material expression of cultures through space and time. It must also include cultural and ecological anthropology that would form a basis or understanding cultural infrastructure of our social life.

Historical Anthropology ; Historical anthropology takes its data from conscious expression of social life. It is therefore a study of cultures, which include their institutions, their functional interrelationships, and dynamic processes by which culture and the individual interact in order to understand the present pattern. Architecture can be seen as a social institution, which in its material represents conscious expression of social life. In its conscious expression architecture can be seen as a conveyor of meaning, in other words, a participant in human signification. It can therefore be studied as a. semiological system. Architecture as objective reality plays a role as any other phenomena in our environment. It can therefore be studied from a phenomenological point of view. Historical anthropology is therefore a vital basis for a history of architecture because through it we can discern architectural semiology and phenomenology. These two terms are discussed below.

Semiology; Semiology as a field seeks to use language to explore the nature of human signification or meaning. Architecture as a semiological system is concerned with buildings as symbolic artifacts. It is concerned with lay perception, which is essential in functioning architecture and therefore communication of architecture in a dialectical process. Therefore, semiology is a key area in any dispute over meaning in Architecture.

Phenomenology; Phenomenology is a study of reality as perceived and understood by the mind In other words it is a study of consciousness. Architectural phenomenology deals with typological explanation and classification of buildings, psychological impact of spatial experience, categorization of meaning in current and historic buildings.

Africa HABITAT Review 1(2006)

Historical anthropology as a basis for history of architecture is particularly important in the African context because without document history of architecture, only through it can we analyze the symbolic content of our architectural past and, therefore, heritage.

Cultural and Ecological Anthropology; Social life - culture is perpetually in the process of transformation. Rapid technology advancement dictates rapid cultural evolution. If culture can be taken as form architecture is its counterform. To create a valid Architecture, it is important that an architect is equipped with tools to discern its basis. Cultural anthropology discerns not only the current state of social life but also the future through cultural evolution.

Ecological anthropology seeks to understand man in his habitat. Culture is in part a result of man's struggle to come to terms with nature while cultural anthropology seeks to decode the codes-culture is the inner psychology of mind. Ecological anthropology, therefore, seeks to understand the dialectical process through which man assimilates the material world of his environment and transforms them into cultural codes.

Further, anthropology, as a basis of theory of architecture is important because it seeks to understand man's process of transforming the material world into knowledge and symbolic cultural codes. It, therefore, seeks to understand the theory of knowledge, epistemology, and the principles underlying all knowledge - philosophy. Anthropology also seeks to understand sensuous relationship between man and his material world - aesthetics. In other words, architecture viewed as a cultural artifact has the benefit of being analyzed from many other perspectives for instance, philosophical, aesthetic, and technological, among others. That is an anthropological perspective in architecture is all embracing.

5. References

Badcock, C. (1975) *Levi Strauss Structuralism and Sociological Theory*. London: Hutchinson & CO. (publishers) Ltd.

Broadbeant, B. (1980) *Signs, Symbols and Architecture. Chichester:* John Wiley & Sons Ltd.

Boesiger, W. (1961) *LeCorbusier, Complete Works (1946-1942).* Zurich Editions: Giusberg Zurich.

Levi-Strauss, C. (1968) *Structural Anthropology*. London; Basic books, Inc

Mellow, M. (1976) *Hertzberger, The Central Beheer Office Complex Appledoorn* London: Architectural Design Magazine.

Murphy, R. (1971) *The Dialectic of Social Life.* New York: Basic Books Inc

Norberg, S. (1975) *Meaning in Western Architecture*. London: Macmillan Publishers Ltd.

Pallasm, M. (1987) *"Towards a New Humanism Aspects of Alva Alto's Architectural Thinking".* London: Space Design Magazine.

Peter, E. (1970) *Hartshorne and Neoclassical Metaphysics.* Lincoln: University of Nebraska Press.

Rapoport, A. (1969) *House Form and Culture*. Englewoodcliffs: N.J. Prentice- Hall, Inc.

Robinson, J. (1984) *"Architecture As Culture Artifacts: Conception- (Deception)"; Paper Presented to Built Form and Culture research Conference"*. U.S.A: University of Kansas St. Lawrence.

Ronner, H., Haverl, H., Vasella, A. (1977) *Lois Kahn Complete works 1935-1974*. Boulder: Colorado. Westview Press.

Service, E.(1971*) Cultural Evolutionism: Theory in Practice.* San Francisco: U.S.A. Hall, Rinehart and Winston Inc.

Siegried, G. (1954) *Space, Time And Architecture.* Cambridge Mass: Harvard University Press.

Tafuri, M. (1980) *Theories and History of Architecture.* London: Granada Publishing Limited.

Venturi, R. (1977) *Complexity and Contradiction in Architecture*. London: The Architectural Press.

Whiffen, N. (1970) *The History of Theory of Criticism of Architecture.* Cambridge Mass: The M.I.T Press.

Jenks, C & Baird, G (Ed), *Meaning in Architecture.*

Klotz, H. (1988) *The History of Postmodern Architecture.* The M.I.T Press.

The Nigerian "Fence Culture"

***Cordelia O. Osasona**

Received on 24th April, 2006; accepted on 18th September,2006

Abstract

A fence is something with which virtually everyone is familiar. In everyday usage, the word is connotative of a barrier or at best, a delimiting phenomenon. More technically, it can be said to be a structure (of varying material options), that clearly defines territorial boundaries and imposes physical restrictions. Historically, landscape fencing is identified with one of the hallmarks of "civilized" existence i.e. animal domestication. In the same context, its property-delineating and security-imposing characteristics are as old as when the instinct to personalise space, on the one hand, and to defend his territorial integrity, on the other, first welled up in man. On the Nigerian scene, within the last thirty years (specifically since after the Civil War), the role of the fence has been undergoing subtle though definite metamorphosis. The fence has moved through the traditional roles, to an architectural "accessory" and, more recently, to a status symbol. In the process, "fence architecture" (an increasingly-important and highly-elaborated aspect of Nigerian architectural practice) has been created. The paper sets out to examine various issues relating to the phenomenon of fencing. The socio-political factors that have introduced a divergence in the generally-accepted roles of fencing vis-à-vis the Nigerian situation, are outlined. A panoramic view of some products of "fence architecture" is also presented. The economic, social and environmental implications of the contemporary practice are discussed, and it is submitted that though this fast-growing architectural culture is generally beneficial, it may account for as much as 20% of project cost.

Key words: *fence, roles, implications*

1. Introduction

The phenomenon of fencing, for whatever reason, is very old indeed. The oldest aggregations of humanity credited with being "civilized", featured fencing in its most rustic form, with respect to animal-husbandry. Over time, as a result of various enterprises engaged in by mankind, other roles came to be defined for the fence. These have ranged from routine property-delimitation,through agricultural use, to a security expedient. As should be expected of such a multi-faceted phenomenon, down through the ages fencing has been expressed in many different materials. The popular options include, traditionally, earth and stone and, more contemporarily, barbed wire.

2. The Roles

The expedient of erecting a barrier was embarked upon, traditionally, for a variety of reasons, notable among them being (i) to establish limits of property, (ii) for agricultural purposes, and (iii) for defence.

i) *Property-delineation*

In this context, the role of the fence dates back hundreds of years. According to Rappoport (1979), with Australian aborigine groups, it was not dependent on physical barriers; a change in nature of terrain (occasioned by sweeping a 4.5 metre-radius round the dwelling), marked the boundary between a particular homestead and other spaces (e.g. the desert). In a similar vein, among the Sixteenth-Century Desana of the Upper Amazon Basin, a fence did not only consist in a visible protective barrier; it also embraced "an invisible stratum that covers it (the dwelling) like a placenta" (Guidoni, 1939, 102), forming a cosmic boundary. Similarly but more contemporarily among squatter settlements in South Africa, whitewashed "corner-stones" suffice to mark boundaries and discourage trespassers (Rappoport, 1979). Pre-industrial Europe was agricultural in economy. As such, apart from the rich (termed "lords-of-the-manor") who lived in fortified residences, the populace lived in cottages that were part of farmstead layouts. Family holdings were marked out by traditional methods of fencing, which generally, featured masonry or plant hedges.

During the Eighteenth Century in England, property-fencing adopted low walls into which iron spikes were fitted. A view of the house and grounds from the adjoining access road was virtually uninterrupted (implying that the use of the fence-cum-gate was almost a mere formality).By the Nineteenth Century, secluded and scattered dwellings in the open surroundings of countryside and town suburbs, had very low walls. In the Twentieth Century, these low fences were completely discarded (particularly in America), and houses were left to stand unobtrusively in large, communal parkland (Neufert, 1980). Even in large towns where land was at a premium and population figures high, the architectural expedient (i.e. multi-apartment and terrace-housing), employed fencing in the most minimal way, and for the obvious purpose of establishing property boundaries.

** C.O.Osasomo a Senior Lecturer in the Department of Architecture, Obafemi Awolowo University.*

ii) ***Agricultural Use***
Traditionally, fencing was used here generally to restrict the movement of animals i.e. either to keep them within a particular location, or out of cropped fields. Back into antiquity, it was necessary to confine these animals, captured from the wilds, in order to domesticate them. (As early as about 2,000 B.C. in China, it had been necessary to confine animals for the purpose of domestication). More contemporarily, in the frontier days of the United States, fencing was used both as a constraining device, and to create physical separation between farms, ranches, range lands and any other agricultural development.

iii) ***Defence***
In primitive societies, all over the world, where inter-tribal wars were common, whole settlements were fortified by defence walls; the "Great Wall of China" is a classical example. Begun in the Third Century B.C., it is the largest construction ever made (Guinness Encyclopaedia, 1995). 2,400km long, it was built to keep out nomadic invaders from the north. The Roman Empire, among its other attributes, was noted for the prime consideration it accorded political and security issues. About the period of civil unrest and barbarian invasion (i.e. around A.D. 300), it was the practice to protect newly-founded colonies by erecting stone walls around them. Such towns were impregnable not so much by the massiveness of the encircling wall(s), but more by the use of cunning device: they were designed such that there was an entrapping space between the outer gates and those properly leading into the town, from an inner wall. An invading force was thus drastically dealt with by archers from the towers flanking the gates.

In the political turbulence of feudal Europe (i.e. the 13th to the 16th Century), the nobility routinely lived in fortresses, defensively reinforced by precarious sitting and/or the use of moats. (When the drawbridge was up, the encircling ditch either dry or filled with water served as a barrier, keeping out enemy troops).On the African continent, the practice vis-à-vis security, was also traditionally more associated with whole settlements, than with individual dwellings. In Nigeria, for example, the Yoruba Wars gave rise to defence walls in such towns as Ile-Ife, Old Oyo, Ibadan, Owo and Ilesa, to mention a few. Most of these towns combined the use of walls with ditches. Several had not just one, but a series of concentric walls e.g. Osogbo, Old Oyo, Ife and Ikirun, which had two each (Ojo, 1967). Such walls were extensive, and ranged in height from about 1.8 metres to 6 metres. The Ijebu Kingdom had a 128km-long town wall, 6 metres high, with a 7.5 metre-deep moat (Ojo, 1967). Similar protective barriers were erected around Kano, Benin and Zaria. Apart from the major purposes discussed above, fencing is also used for compartmentalizing operations and keeping workmen out of danger, in factory layouts; it is used environmentally as a wind-break and also as a barrier (particularly close to rail-lines or roads).

3. The Materials
Various materials have been used, over time, to effect fencing. These range from plants, through cumbersome masonry, to tough (but light) wires. The use of hedges was traditionally more typical of Europe and North America, than Africa. Low-growing shrubs with dense foliage (and possibly thorns) were preferred. They had the advantage of requiring less ground space than masonry fencing. Wooden or rail fences were common in frontier North America. They were assembled from felled logs, and were primarily for restraining horses and cattle.

The construction process was predictably, laborious. A more refined version of the wooden fence was the board fence, constructed of sawn timber, and used in property-delineation. It was often decorative and painted, and hence, expensive. The picket fence (with pointed timber members) is a specific type in this class. Earth (or sod) fences, as the name implies, were constructed of massed earth. They were typical of American prairie States, as well as parts of England (where some of such fences e.g. those in Blewbury, Berks, date back to Saxon times). Such earthen embankments could be topped by thatch (to prolong their life-span) or gorse (to make them more effective as a barrier).

Fences in stone could be dry-jointed, or with top and bottom layers mortar-bonded (e.g. in Aberdeenshire, England). The construction process was tedious, and as with the sod fence the ground space actually occupied by the wall was relatively much. Wire-fencing was patented in the United States and France in the 1860s. It proved a more effective means of restricting animals, as it combined rugged utility with minimal space requirements and relative ease of erection. (The original promotion drive described the barbed-wire fence as "horse high, pig tight, and bull strong" The Encyclopaedia Americana, 1993).

4. The Nigerian Situation
The phenomenon of fencing, with respect to Nigeria (and for the purposes of understanding the issues culminating in the current "fence culture"), will be examined in the light of the colonial architectural heritage, and the socio-political situation engendered by the Nigerian Civil War and the "oil boom".

The Colonial Legacy
The colonial administrators, on arrival in West Africa, found a building culture in place which, according to

Rudofsky, could aptly be termed "architecture without architects". Thus, each ethnic group unconsciously produced house forms to suit its own peculiar socio-cultural environment. The types of fence that were associated with such spontaneous building practices were, at the settlement level, defence walls, and at the more domestic level, those used for property-delineation and as animal pens. Fencing to define limits of territory, was either an independent structure within which a compound was articulated, or constituted part of the very fabric of the dwelling enclosure.

To suit the British administrative machinery, various physical infrastructure were put in place. Of relevance, are those for residential accommodation. This was effected in areas originally termed "European Reserved Areas" (ERA) which eventually came to be known as "GRAs" (Government Residential Areas). Here, originally and in keeping with their practices back home in Britain property-delineation was effected by the use of herbaceous borders. Later, dwarf walls were introduced; these could be topped by an iron grille, with iron gates defining the entrance into the grounds.

In its articulation, colonial domestic fencing was similar to the traditional: it was light and unpretentious, almost assuming an air more of environmental symbolism than practical utility. Most housing estates, developed on the eve of independence and shortly after, were patterned on similar lines with respect to property-delineation. A case in point is "Old Bodija" in Ibadan, where properties were originally separated only by planted hedges. The first set of dwelling units was ready for occupation by the end of 1959 (Osasona, 1991). For the next ten years after independence, very little of significance occurred in the development of the fence: gradually, hedges gave way completely to walls of sand-cement blocks the new building introduced by the colonialists. These masonry fences, however, were still essentially relatively low in height, modest in elaboration, and obviously merely serving the expressed function of de-limiting property.

Aftermath of the Civil War/ "Oil Boom"

Events leading up to the Nigerian civil war have been extensively catalogued in the appropriate annals. Suffice it to say that, nationally, it was a bitter, unforgettable experience. More than three decades on, scars mostly of a psychological nature frequently manifest, and at unexpected times. On January 15, 1970, the war was officially declared over, and a period of "reconciliation, reconstruction and rehabilitation" ushered in.

Everyone was encouraged to forget the past and put hands "on deck" to build a new Nigeria. An appreciable percentage of the call-up army that survived the war was subsequently demobilized. They were admonished to go back to their families and try to pick up the threads of their old lives. There appeared to be an assumption that their former jobs would still be waiting for them; that their educational prospects would still be intact; that their former farmlands would still be secure to them should they desire to return to farming. That some of them were maimed, that most of them could not automatically key into their former routine, did not appear to have been considered.

The fallout from the scenario painted above, of relevance to this work, is that after the war, a crop of disgruntled, socially-disadvantaged and mostly able-bodied and young men, was unleashed on Nigerian society. These men had been taught to handle arms, and to be essentially, ruthless. Many of them, albeit illegally, still had access to arms. The predictable outcome of the inter-marriage between these various factors was that these ex-soldiers turned around to terrorise civilians; there was a hitherto unprecedented spate of armed robberies. In the wake of this, people took to securing their lives and property the best way they could: by fortifying their homes and/or engaging the services of night-guards. Prior to this, at the domestic level (as already discussed), the fence was essentially an ownership symbol. However, overnight, on the heels of the new social menace, it became a security device. Reminiscent of medieval practices, homes started taking on a fortress-like look: fence-walls became higher, more solid and generally more utilitarian; openings (i.e. entrance doorways and windows) became burglar-proofed with iron bars and frames.

To serve as an additional deterrent, these higher walls (some 3.5 metres tall) were also topped with sharp-pointed broken bottles or iron rods, set in wet mortar. The "oil boom" of the 1970s played its own part in the scheme of things. (In fact, the prevalent national affluence of the times is supposed to have been a major factor aggravating the already tense situation vis-à-vis unemployment). For those who had wealth and were coming into more it provided the means to engage in ostentation. Thus, it was a boom period for architecture: patronage of building professionals by government and private individuals was at its peak, resulting in transformed cityscapes. However, this provided "justification" to the already-disgruntled, for dispossessing the rich of their wealth. As pockets of the urban fabric got a face-lift, transformations took place at the level of the individual plot: in keeping with the generally-appreciated understanding and quality of design, the perimeter fence gradually became something to be imbued with aesthetic appeal, over and above functional requirements. By the late '80s, a set of architectural drawings without "fence details" was incomplete.

Africa HABITAT Review 1(2006)

Fence designs became more complicated, and consequently, more expensive. The fence, thus again, underwent a gradual metamorphosis this time, from being only a security measure, to one also connoting social standing. In its new, subtle role of being a beautifying agent, this approach to fencing could be said to be making the best of the bad job of barricading oneself in. Despite the relative decline in government patronage, the last fifteen years have witnessed an unprecedented wave of architectural creativity in Nigeria. This has been occasioned by the investment of "finance houses", oil companies (and other multi-national concerns) and indigenous multi-millionaires, in real estate. Coupled with this, has been the ongoing romance between eclecticism and "hi-tech" an adventure into which Nigerian architects appear to have launched themselves with great relish. On the social scene, armed robbers have become increasingly more daring, reducing fences to mere architectural show-pieces.

Despite such measures as electrifying these fancy fences, investing in guard-dogs (of wide-ranging and exotic breeds) to complement the efforts of night-guards, and installing all manner of sophisticated electronic gadgets, the modus operandi nowadays, appears to be sheer audacity: it is common knowledge in Nigeria, that when men of the underworld have purposed to engage in their nefarious activities, and have accordingly selected their prospective victim, they tail the unsuspecting prey to his home, and as he is being legitimately ushered in at the gate, "escort" him in! So much for fences, guards, iron grilles and burglar-alarms. Presently, the fence has acquired a role which is a far-cry from the traditional ones it fulfilled. At the domestic level, it still delimits property. With back-of the-house developments, it could still provide compartmentalization separation into various use-spaces.

However, for householders, the perimeter fence has lost the protective potential it acquired over time. Today, it is more prominent in its role as a status symbol. At this point, it is pertinent to clarify that in its journey from symbolic utility to social symbolism, only the length of the perimeter fence abutting main roads, has undergone this transformation. (The reasons are obviously because, as earlier-stated, in elaborating the increasingly intricate designs, fencing has become relatively expensive, so that only sides to be displayed for public appreciation need be so heavily invested in. Also, as property owners invariably share common boundaries, there is no call to impose ones design on another's property). Also worthy of mention, is a phenomenon closely-associated with fencing which has also undergone corresponding transformations: the entrance gate(s). The gate-manufacturing enterprise has recorded such a boom that, these days, designs rival those of fences in intricacy, originality and monumentality, and patronage appears to be on the increase, daily.

5. Fence Types

It has been established that the fence has become a design feature in contemporary Nigerian architectural practice. A good building design without an equally good (or even better!) fence design to complement it, is inadequate. Expressed in other words, a fence is now an indicator of the class of building behind it. Even where, for reasons of wanting to play up the security / privacy role of fencing, it is built high and without view-openings, its elaboration is still a pointer to the scale of grandeur of the house it is screening. A survey of the various types of fencing styles currently in vogue was conducted in several towns within the country (notably Ibadan, Ilorin, Osogbo, Ile-Ife and Abeokuta).

From the photographic material obtained, it would appear there are as many varieties as there are houses! This notwithstanding, it has been possible to make some general observations, based on style and materials used. With respect to materials, the popular options were found to be sandcrete blocks, concrete, bricks, decorative blocks (in sandcrete or burnt clay) blue-stone rubble and iron bars. Additional finishing materials include tyrolene, texcote (and other exterior texture finishes) and tiles. Employing the significant feature(s) in its elaboration, the following broad stylistic groups of fencing have been identified:

Finned fencing, Curvilinear fencing, Solid-wall fencing , Wall-and-planter fencing, Perforated/screen-wall fencing, iron-and-masonry fencing, and discontinuous-wall fencing. Despite this attempt at classifying the prevalent design styles, it is pertinent to state that, more often than not, a 'hybrid' approach is adopted in articulating these fences i.e. in addition to their own distinguishing characteristics, many designs borrow features from other styles.

i) Finned Fences

The most prominent feature of this type of fence are fins either made from blocks or reinforced concrete. The fins could run all the way from bottom to top, stop part-way to the top, or start mid-way (being supported by a main wall) and continue to the top (figs. 1&2).

ii) Curvilinear Fences

Fences that conform strictly to a sinuous outline, and others that define a generally undulating façade, have been so classified. By virtue of their meandering profiles, such fences are necessarily material-intensive. They are popularly combined with planters (figs. 3-5).

iii) Solid-wall Fences
This classification is broad, as it encompasses all fences that are continuous in outline and homogeneous in material. Thus, solid fences in sandcrete blocks, clay brick or stone, fall into this category. Also, associated with this class is a wide range of surface treatments: relief-work, tiling, mortar-texturing, etc. (figs. 6&7).

iv) Wall-and-Planter Fences
These are usually very elaborate in articulation, and both material- and capital-intensive. Very often too, they are associated with uneven outlines and mixed media. The planters could either be at normal ground level or suspended (figs. 8&9).

v) Perforated / Screen-wall Fences
Generally, such fences are even in façade, and employ masonry. The common approach for screen-wall fences is to have a solid-wall base (usually not less than half the overall fence height) topped with perforated decorative blocks. Other fences in this category employ a skilful arrangement of the sandcrete blocks used generally for the fencing, in creating openings at regulated intervals in the façade (figs. 10).

vi) Iron-and-masonry Fences
Despite the fact that some of the other categories of fence already discussed have recourse to iron, a separate class has been carved for fence-types where its use is prominent, and not necessarily structural. Hence, the iron is integrated with masonry as grilles, as panels or a combination of the two. The significant characteristics of this type of fence (apart from the fact that the technique is compatible with several of the types discussed already), is that it is a see-through kind of fence (figs. 11&12).

vii) Discontinuous-wall Fences
This type of fence is elaborated such that the façade is broken up into clearly-defined segments. The masonry-wall is interrupted either by air-gaps or iron-grilled sections resulting in discrete portions of fencing. As implied, it is a style that often harnesses different techniques and materials.

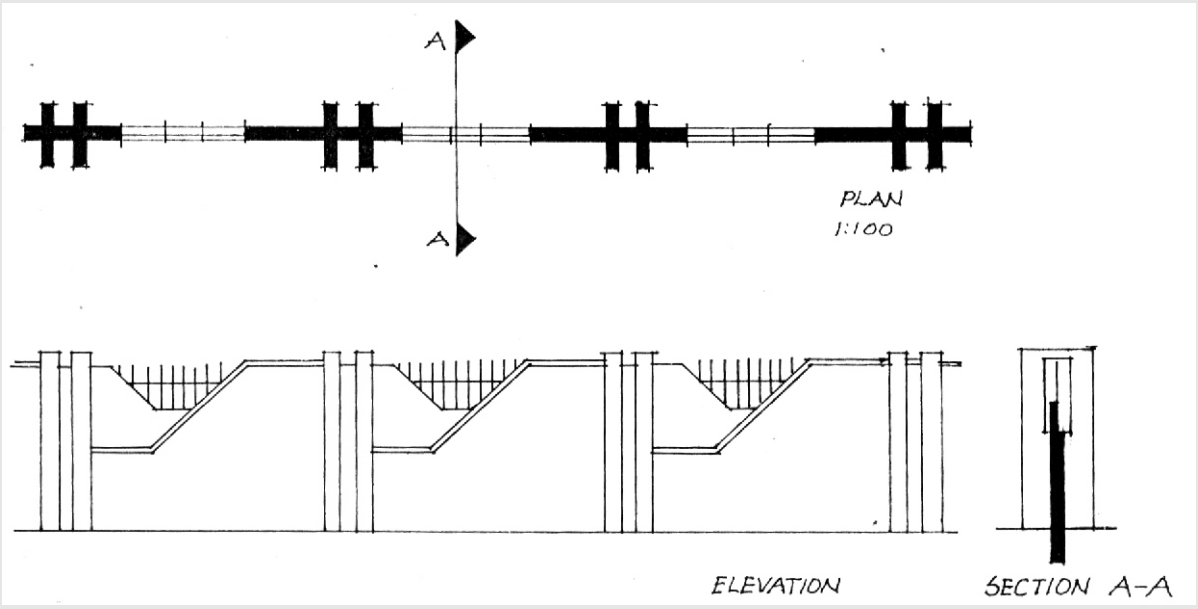


Fig. 1

Africa HABITAT Review 1(2006)

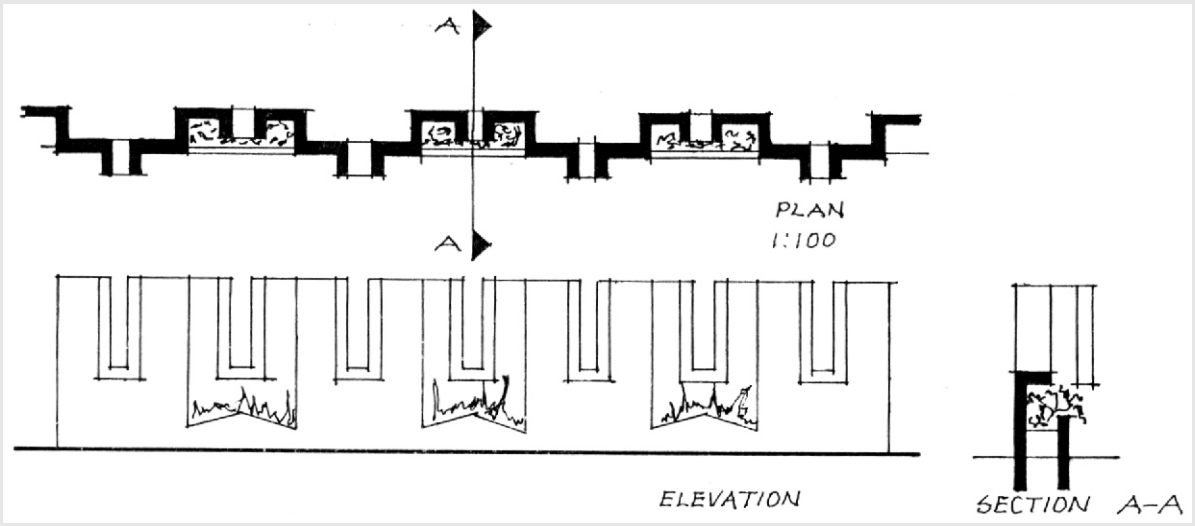


Fig. 2

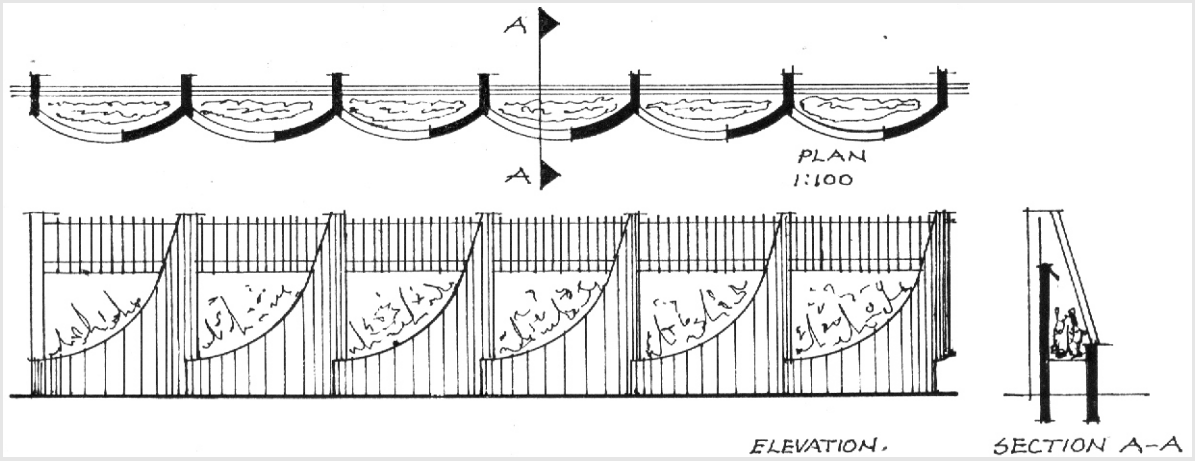


Fig. 3

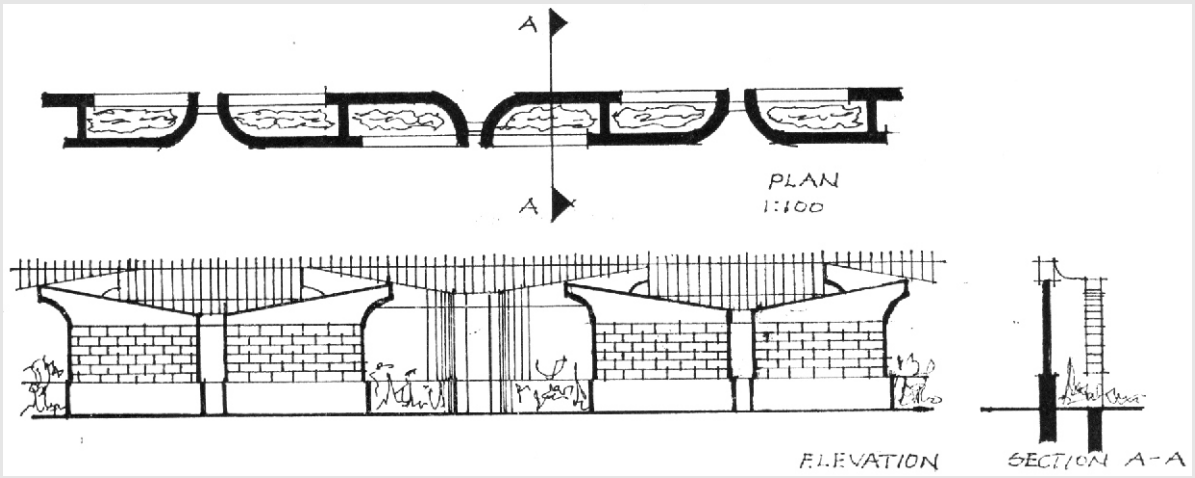


Fig. 4

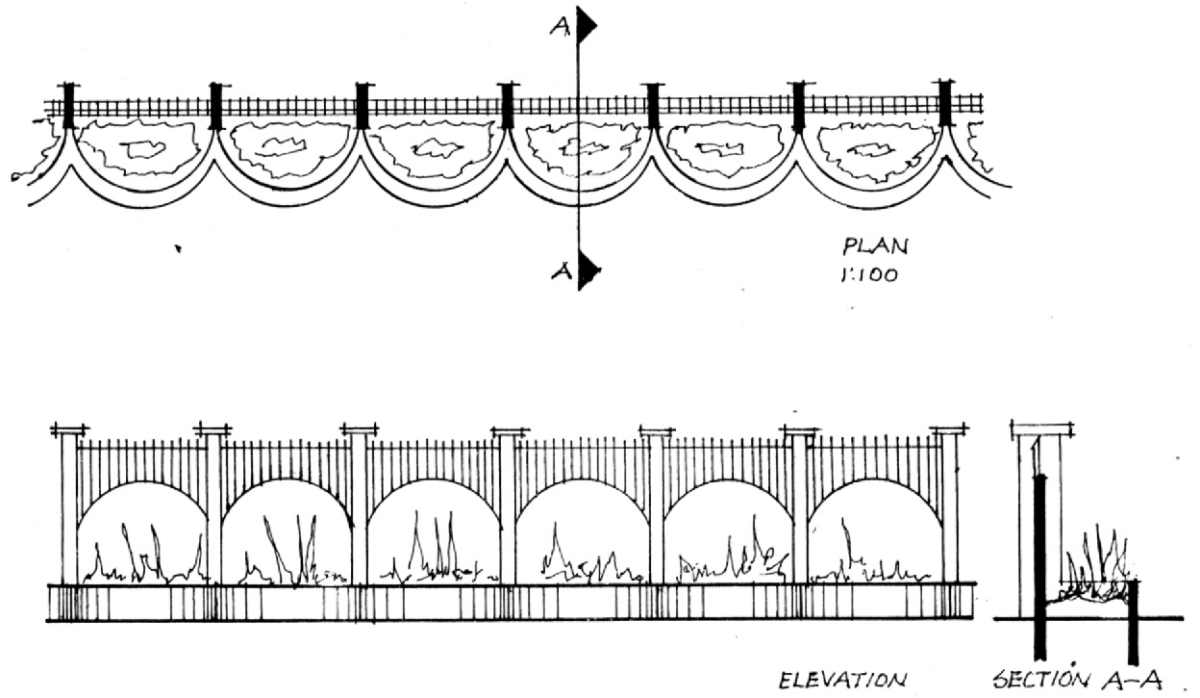

A
A
PLAN
1:100
ELEVATION
SECTION A-A

Fig. 5

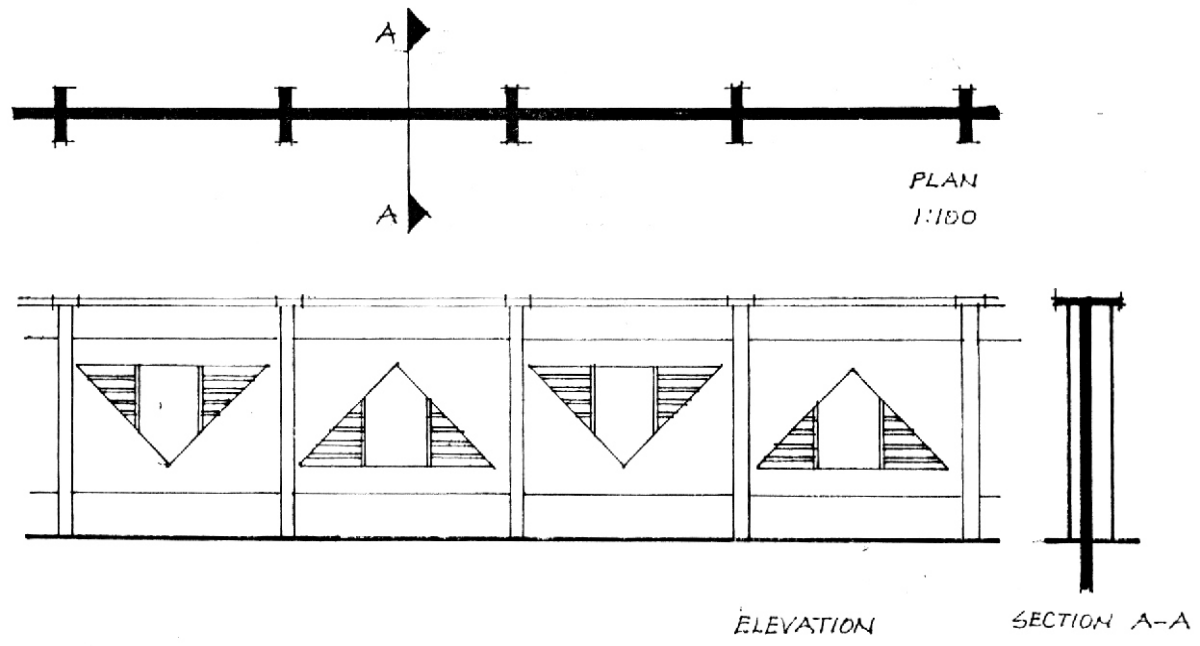

A
A
PLAN
1:100
ELEVATION
SECTION A-A

Fig. 6

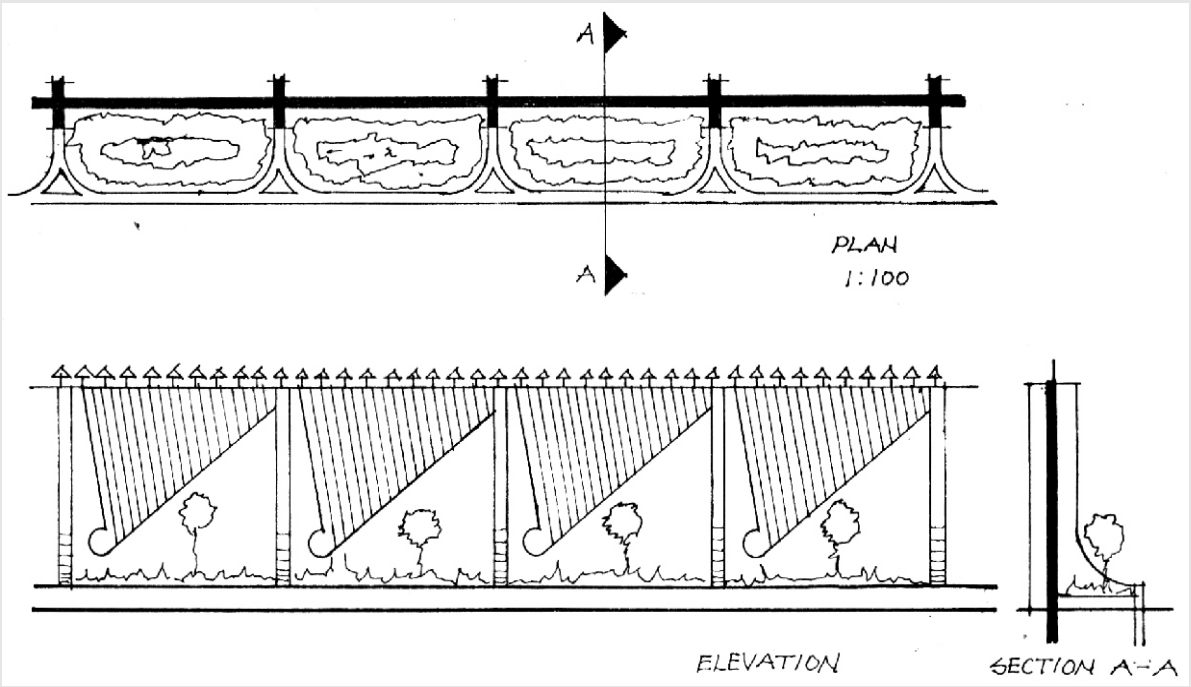

A
A
PLAN
1:100
ELEVATION
SECTION A-A

Fig. 7

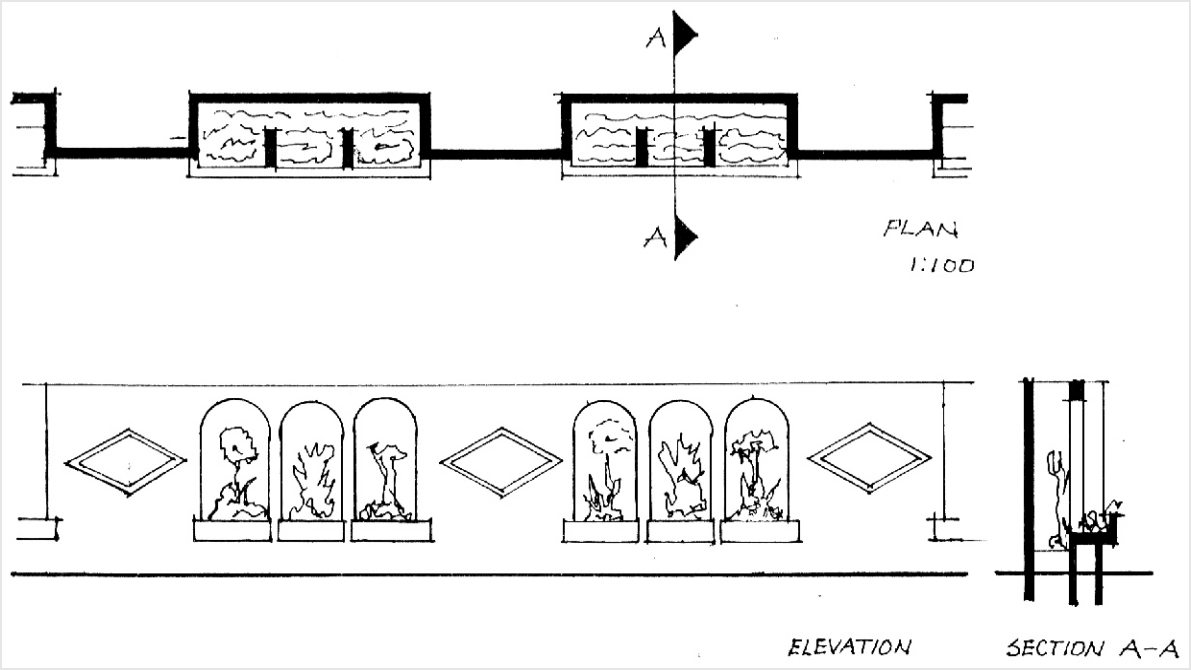

A
A
PLAN
1:100
ELEVATION
SECTION A-A

Fig. 8

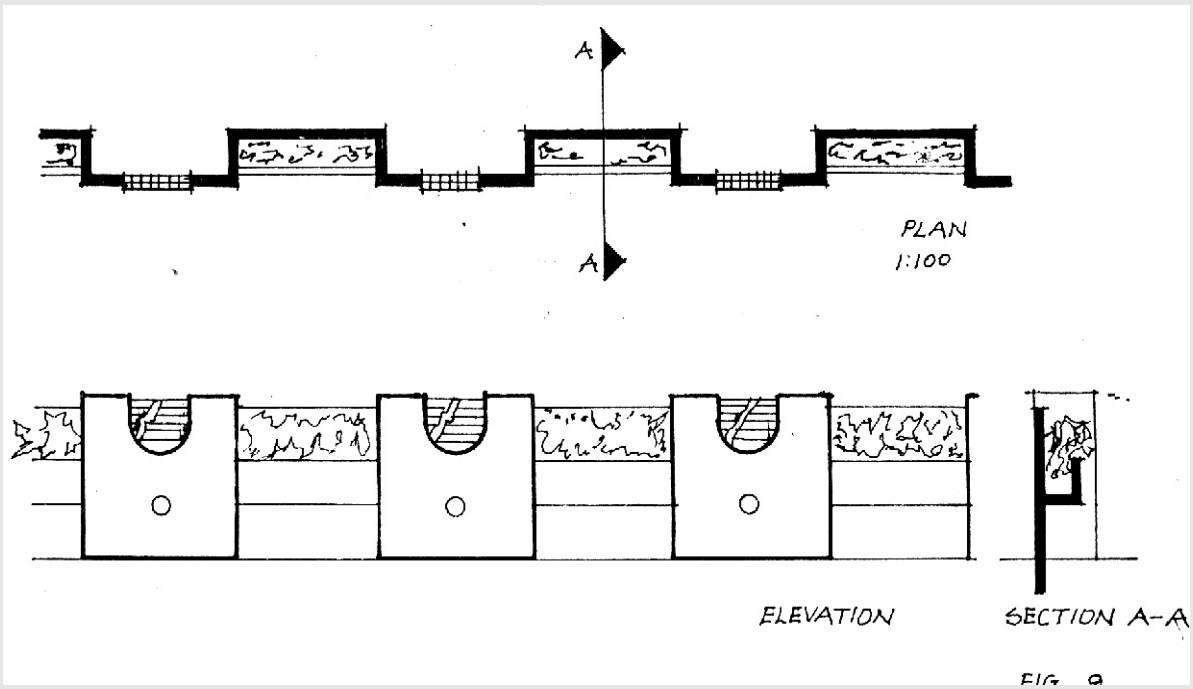

A
A
PLAN
1:100
ELEVATION
SECTION A-A

Fig. 9

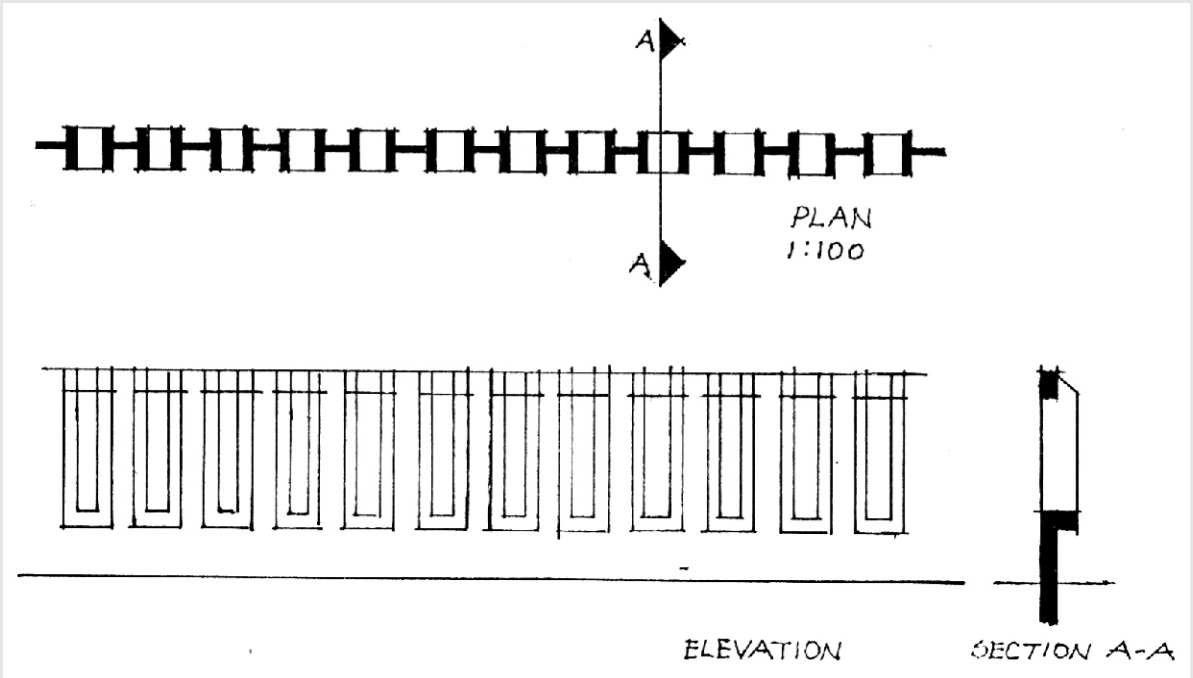

A
A
PLAN
1:100
ELEVATION
SECTION A-A

Fig. 10

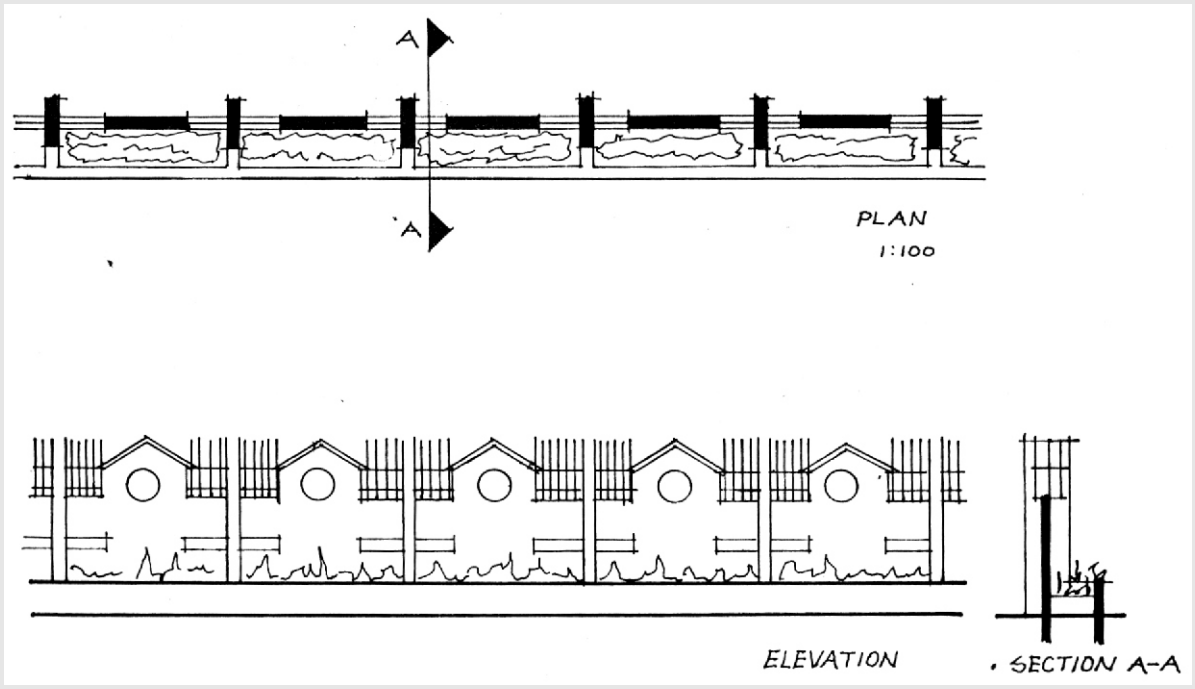

A
A
PLAN
1:100
ELEVATION
SECTION A-A

Fig. 11

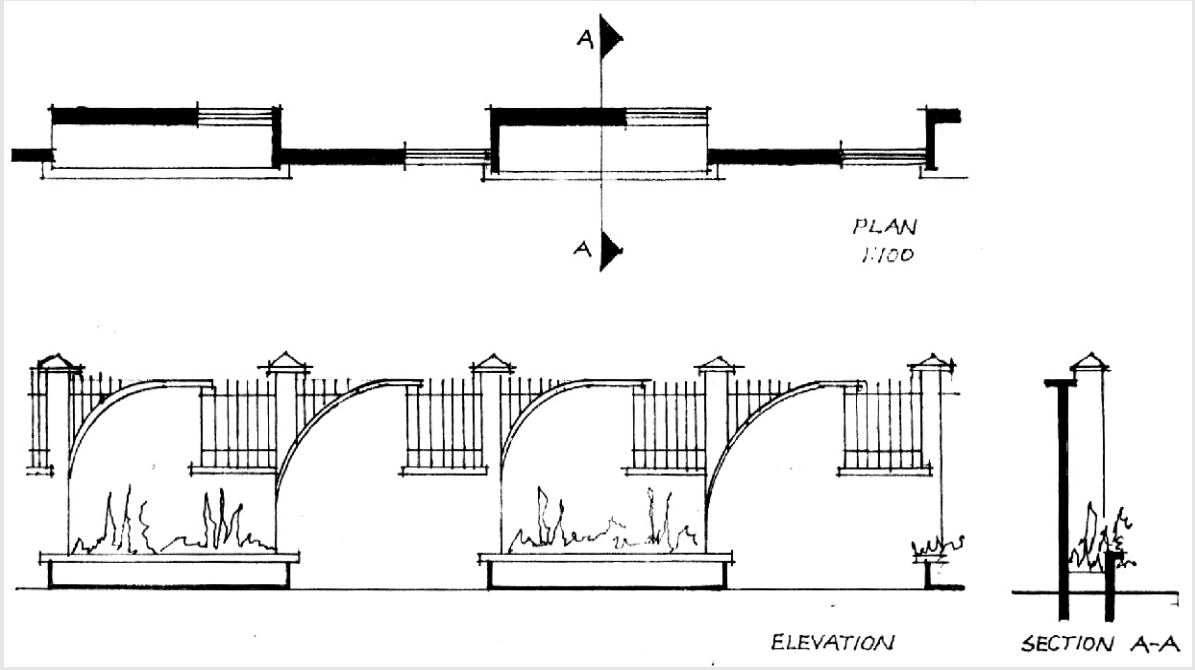

A
A
PLAN
1:100
ELEVATION
SECTION A-A

Fig. 10

6. Study Findings Implications

Social Implications

In its composition and general outlook, a fence in Nigeria is now a pointer to who is who in society. This is in the sense that it is a reflection of how much has been expended on developing property which in turn is an indication of how much the owner has to his name. These fancy fences and gates have set a standard for property-development. Even modest-scale building projects now see the need to give special consideration to the enclosure. For the not-so-wealthy property-developer, this poses something of a problem: while appreciating the need to contribute positively to the urbanscape, an attempt at "keeping up with the joneses" (in terms of complexity/grandeur of fence-design) will doubtless result in stretched financial resources. In essence, the cost-implications of effecting some of these designs may impose additional stresses social and economic on a prospective developer.

Economic Implications

As previously-stated, fencing has ceased to be a routine, relatively-inexpensive enterprise. From analyses of cost implications of some fence designs, it was discovered that depending on intricacy, the cost of fencing could range from about 10% to over 20% of actual building cost; also, as a percentage of total building costs, it was invariably never lower than 9%. A comparative analysis of the cost-per-metre length of various fence design options (based on the broad classification given) was also conducted. Some of the results are as tabled below:

From Table 2, it can be deduced that straight-run fences with minimum surface treatment, are the most inexpensive. Conversely, the more sinuous in outline (or the more sculptured in outlook) a fence is, the more expensive. Also, generally, the more recourse the execution of the design has to use of reinforced concrete, the higher the cost of construction.

Environmental Implications

Since the phenomenon under review relates directly to building, it becomes necessary to consider the impact it has had on the physical environment. So far, the current trends have been examined with respect only to domestic building. However, in reality, the practice is not restricted to residences alone; commercial, religious, community and health projects are affected. Given the widespread distribution of the new-look fence, and the fact of designs generally being the complementary work of architects, one may describe the phenomenon as positive, and the outlook as pleasant. A property asserts itself better environmentally, if the fence in which it is circumscribed, adds to its aesthetic value. Since (like it has been said before) the general emphasis is now on ingenuity in contrivance and beauty in execution, everywhere such a fence is erected, there is a spot of conscious space-ordering and refinement. Cumulatively, it is observed that the trend is effecting some measure of upgrading of the urban built fabric.

Table 1

For reasons of confidentiality, proper project titles have not been used

Serial No.	Building Project	Fencing Cost (N)	Actual Building Cost (N)	Fencing Cost as a % of Actual Building Cost	Total Project Cost (N)	Fencing Cost as a % of Total Project Cost
1	Project A, Ile-Ife	1,820,000	12,402,000	14.68	14,222,000	12.79
2	Project B, Ile-Ife	1,954,200	11,166,540	17.50	13,120,740	14.89
3	Project C, Ile-Ife	2,282,670	12,778,440	17.86	15,061,110	15.16
4	Project D, Ibadan	1,171,700	6,048,960	19.37	7,220,660	16.22

Table 2

Estimates in Tables 1 & 2 are based on Ile-Ife prices, October, 2005.

S/No.	Fence Type	Cost/m (N)
1	Solid fence with relief ornamentation, Ilorin, Kwara State (fig.6)	9,000
2	Perforated fence, Osogbo, Osun State (fig. 10)	9,700
3	Wall-and-planter fence, Ilorin, Kwara State (fig. 8)	11,000
4	Finned fence, Osogbo, Osun State (fig. 2)	12,000
5	Curvilinear fence, Ibadan, Oyo State (fig. 5)	14,700
6	Curvilinear fence, Ibadan, Oyo State (fig. 3)	19,200
7	Curvilinear fence, Ibadan, Oyo State (fig. 4)	21,600

Africa HABITAT Review 1(2006)

7. Final Submission

The last hundred years of architectural practice in Nigeria have witnessed phenomenal developments and varying expressions in the built environment. Ornamental (or monumental) fencing is one such expression. The trend has assumed the proportion of a distinct architectural culture. Having undergone various transformations in context, it appears to have stabilised as a beauty-generating element of the urban landscape. Whatever shortcomings may be inherent in this particular culture (based on traditional and other concepts of functionality) its potential as a tool for urban beautification, should not be ignored. Inasmuch as it is contributing positively to a consciousness of environmental liveability, the trend should be encouraged.

8. References

Bailey, C., (1951), *The Legacy of Rome* (Clarendon Press, Oxford, UK).

Guidoni, E., (1978), *Primitive Architecture* (Harry N. Abrams Publishers, New York, USA).

Hayward,.J., et al (1997), *The Atlas of World History* (Cassell Plc, London, UK).

Jones, A. H., (1968), *A History of Rome* (Walker, New York, USA).

Neufert, E., (1980), *Architects' Data,* Second English Edition (BSP Professional Books,
Oxford, UK).

Ojo, G. J. A. (1967), *Yoruba Culture* (University of London Press, London, A Short Introduction to Non-
Pedigreed Architecture, UK).

Osasona, C. O., (1991), Optimum Housing for Low-/Middle-Income Groups: The Extendible
House*, The Nigerian Institute of Architects Journal,* 6 (1): pp 26 44.

Rappoport, A., (1979), *Cultural Origins of Architecture -Introduction to Architecture*
(McGraw-Hill Book Co., New York, USA).

Rudofsky, B., (1964), *Architecture Without Architects*: *A Short Introduction to Non-*
pedigreed Architecture (Academy Editions, London, UK).

Schwerdtfeger, F. W., (1982), *Traditional Housing in African Cities* (John Wiley & Sons,
Chichester, UK).

Sullivan, M, (1967), *The Arts of China* (University of London Press, London, UK).

Everyman's Encyclopaedia (1967) - J.M Dent & Sons Limited, London, UK.

The American People's Encyclopaedia (1962) Grolier Inc., New York, USA.

The Encyclopaedia Americana (International Edition), 1993 Grolier Inc., New York, USA.

The Guinness Encyclopaedia (1995) Guinness Publishing Limited, Enfield, UK.

Market Valuation of Residential Investment Properties:
The Case of Reversionary Freehold and Leasehold Properties in Uyo, Nigeria

Namnso Bassey Udoekanem

Received 25 April 2006; received in revised form 31 August 2006; accepted 18 September 2006

Abstract

Prior to the advent of inflation in the property market worldwide, property investment valuation was solely based on the logic of the conventional technique which relies on some assumptions that there is no growth in future rental value over present rental value and that rents are the early 1970s affected the property market resulting in increases in rents and introduction of rent reviews in leases. Since then, contemporary techniques have been proposed by property researchers for the valuation of property investments in times of inflation. This paper examines the market valuation of residential investment properties with particular focus on the valuation of reversionary freehold and leasehold properties in Uyo, Nigeria. The paper argues that in the context of Nigeria's Land Use Act which provides for payment of ground rent which is subject to reviews, coupled with the rental reviews on the building, the conventional valuation technique can no longer produce accurate and logical valuation of reversionary freehold and leasehold residential investment properties in Uyo, Nigeria due to the fact that it cannot handle the problem of rent reviews and complex rental gearing. The paper concludes that contemporary techniques of property investment valuation can handle these problems and shows the adaptation of one of these techniques to the Nigeria situation based on data from the property market.

1. Introduction

Market Valuation involves the analysis and interpretation of the market to predict the most likely selling price of a property. It is an attempt to estimate the price, which a property may fetch if offered for sale in the open market (Skyes, 1983). However, Daly, Jenkins and Gronow (1997) argue that in addition to the use of appropriate techniques to analyse market data, market valuation also involves the analysis of buyer behaviour to identify explicitly those attributes which purchasers consider will affect the value of the subject property and reflecting these appropriately in the valuation process. They call these attributes "Value influencing factors". In the case of an investment property, market valuation consists of the determination of market rental value and market capitalisation rate and the capitalisation of the market rental value by the capitalisation rate to arrive at the market capital value or the open market value of the property.

The concept of the open market value, which is the central basis of value, assumes the most probable selling price. According to Baum and Mackmin (1989, 95), this presumes a knowledge of the most probable purchaser which presumes detailed knowledge and understanding of the sub-markets within the property market and also assumes sufficient market activity to extract, by analysis, details of returns expected by property investors. The market value of investment properties is the result of the interaction of some market-determined factors. Hargitay and Yu (1993, 215) list these market -determined factors to include:-

(i) Net income
(ii) Estimated rental value
(iii) Lease structure or rent review pattern
(iv) Discount rate and yields.

On the basis of the above factors, open market value of an investment property can be assessed based on the income approach to valuation or the investment method of valuation. The investment method of valuation is a method of estimating the present worth of the right to future benefits to be derived from the ownership of the specific interest in a specific property under given market conditions. It is used for valuing income-producing properties whether freehold or leasehold because it closely reflects the behaviour of the various parties operating in the property market.

However, the changes in the property markets due to the effect of inflation created problems for the traditional property investment valuation technique, as it could not handle the task of rental growth and future value change in its computation. Research programmes into property valuation methods were sponsored by professional bodies in the valuation profession to examine the adequacy of the traditional valuation technique in relation to the realities of the property market.

In the United Kingdom, the Royal Institution of Chartered Surveyors (RICS) sponsored a research and the report suggests that, a greater use should be made of growth explicit Discounted Cash Flow (DCF) models in the valuation of property investments (Trott, 1980). In Nigeria,

** Namnso, Bassey Udoekanem is a lecturer in Department of Estate Management, Federal University of Technology. PMB 65, Minna, Niger State, Nigeria, namkanem@yahoo.com*

Africa HABITAT Review 1(2006)

a similar research programme was sponsored by the Nigerian Institution of Estate Surveyors and Valuers (NIESV) and the verdict of the research findings is that, the investment approach is still the most appropriate approach to the valuation of all commercial and all related residential properties and that, the Discounted Cash Flow (DCF) valuation approaches must be explored by Valuers in Nigeria for the valuation of property investments (Igboko, 1992, 2).

The traditional or conventional investment valuation approach to the assessment of open market value assumes that the current rental value will be available at the subsequent rent review dates and no explicit growth rate is taken into consideration. The implied or anticipated growth rate, together with other uncertainties perceived by the market is assumed to be reflected in the capitalisation rates used. However, valuation model, if to be selected for market valuation purposes must satisfy the following criteria given by Hargitay and Yu (1993, 215).

These are: -

i) It must produce the best approximation of market value at a time;
ii) It should be robust and flexible and able to deal with rent review patterns, multiple tenancies, freehold and leasehold interests and automated computation;
iii) It should be durable, that is, it should require major revision of logic and rationale only if market and economic conditions radically change.

To a large extent, particularly in the market valuation of reversionary freehold and leasehold property investments, the conventional investment valuation approach has been found to fail this test (Baum and Crosby, 1988, 95 109). This failure is the basis of the need for the adoptions of a market valuation model which lends itself to explicit analysis, which does not totally rely on available comparable evidence, and which can handle the problems of rent reviews and future value change in its computation.

2. Review of Residential Property Market in Nigeria

The residential property market is the most active of other sub-markets in the urban areas of Nigeria. The market is very active in the capitals of the 36 states in the Federation of Nigeria, and Abuja, the Federal Capital Territory (FCT). Residential property market in Nigeria comprises sub-markets for tenements, semi-detached houses, detached houses, flats, and maisonettes among others. As analysed by Omuojine (1994), tenements exist in the market mainly on rental basis as they hardly come up for sale, while flats, maisonettes and others exist in the market on rental and sale basis.Market data analysed by Udo (1998) on two major cities in Nigeria, Enugu and Calabar show evidence of rental growth and rent review, with most rent review in the cities being 2 and 4 years.

Property Investment Valuation Models

Property investment valuation involves the estimation of the future benefits to be enjoyed by the owner of a freehold or leasehold interest in land or property, expressing those future benefits in terms of present worth (Baum and Mackmin, 1989,3). Prior to the advent of inflation in the property market, that is, during the pre-reverse yield gap, property investment valuation was solely based on the logic of the conventional technique which relies on some assumptions that there is no growth in future rental value over present rental value; that rents are fixed on long leases without review; and that the capitalisation rate used in the valuation is the internal rateof return expected from the investment. These assumptions have been found to be logical only during the pre-reverse yield gap and were based on the perception of property investors during the period (Baum and Crosby, 1988, 91). The pre-reverse yield gap is the yield gap that existed between gilt and property yields before inflation became a serious problem in the investment market. The increase in property rental values and the introduction of rent review led to the appearance of the reverse yield gap, causing severe disturbance to the assumptions which formed the logic of the conventional technique. Baum and Mackmin (1989, 74) hold the view that the strongest criticisms of the conventional valuation technique are that it fails to specify explicitly the income flows and patterns assumed by the valuer, and that it applies growth implicit all risks yield to fixed contracted tranches of income.

In Nigeria, trends in the residential property market show that there has been growth in rental values with frequency of rent review from the 1970s, an indication that inflation has come to stay in the Nigerian Property Market (Udo, 1989). This has been confirmed by recent research (See Tables 3 and 4). Besides, Nigeria's Land Use Law (the Land Use Act of 1978) provides for the payment of ground rent, which is subject to review. Such review on ground rent may not correspond with the rental review on the building. This situation has created complex rental gearing which the traditional or conventional investment valuation technique cannot handle. Although trends in the property market suggest the adoption of contemporary property investment valuation models in the market valuation of investment properties, valuers in Nigeria are reluctant to use these models.In recent times, the main argument on the subject by some valuers in the country is that contemporary property investment valuation models

are too academic, sophisticated and not easily adaptable to Nigerian property valuation practice (Aluko, 2004). Results of empirical studies on the subject in the past 17 years or so do not substantiate this argument.

TABLE 1
Rental Levels for Residential Properties in Uyo, Nigeria 1990-2005 (3-bedroom semi detached flats and maisonettes)

Year	Rent p.a (Flats) ₦'000	Rent p.a (maisonettes) ₦'000
1990	4	8
1991	6	10
1992	8	12
1993	10	16
1994	12	20
1995	15	25
1996	20	35
1997	25	40
1998	30	50
1999	40	65
2000	50	80
2001	60	100
2002	80	130
2003	95	160
2004	120	200
2005	150	250

Source: *Filed Data collected by the Author in March, 2006*

Contemporary valuation models are discounted cash flow models, all of which are expressions of the same explicit cash flow projection and capitalisation process. They include the Real Value model; Rational model; Equated Yield model; and Real Value/Equated Yield hybrid model. These models are based on the underlying assumptions that there is growth in future rental value over present rental values; that rents are not fixed, but are reviewed at periodic intervals and that the capitalisation rate depends on the preconceived level of growth in the future. The basic inputs of the models include initial yield, rent review period, equated yield, implied rental growth rate and inflation risk free yield (McIntosh, 1983; Crosby, 1986; and Udo, 2003).

TABLE 2
Rent Review Frequency in Residential properties in Uyo, Nigeria

Rent Review Pattern	Frequency
2 years	123
3 years	155
4 years	45
5 years	19
6 years	6
Total	**348**

Source: *Field Data collected in March, 2006.*

TABLE 3
Annual Rent, Rental Index and Annual Rental Growth for Residential Properties in Uyo, Nigeria, 1990 2005

Year	Rent P.a (Flats) ₦'000	Rental Index	Annual Rental Growth (%)	Rent p.a (maisonettes) ₦'000	Rental Index	Annual Rental Growth(%)
1990	4	100	-	8	100	-
1991	6	150	50.00	10	125.00	25.00
1992	8	199.99	33.33	12	150.00	20
1993	10	249.99	25.00	16	199.9	33.33
1994	12	299.99	20.00	20	249.99	25.00
1995	15	374.99	25.00	25	312.49	25.00
1996	20	499.97	33.33	35	437.49	40.00
1997	25	624.96	25.00	40	500.00	14.29
1998	30	749.95	20.00	50	625.00	25.00
1999	40	999.91	33.33	65	812.50	30.00
2000	50	1249.89	25.00	80	1000.00	23.08
2001	60	1499.87	20.00	100	1250.00	25.00
2002	80	1999.78	33.33	130	1625.00	30.00
2003	95	2374.74	18.75	160	2000.05	23.08
2004	120	2999.77	26.32	200	2500.06	25.00
2005	150	3749.71	25.00	250	3125.75	25.00

Source: *Computed from Data in Table 1*

Africa HABITAT Review 1(2006)

Conventional Versus Contemporary Techniques : A major difference in the logic and application of the conventional and contemporary valuation techniques is that, future rental growth in the conventional technique is implicit in the initial yield whereas the contemporary techniques are explicit regarding future growth in rental values (Enever, 1986; Baum and Crosby, 1988; Baum and Mackmin, 1989; Udo, 2003; and Ifediora, 2005). Also, while the conventional technique treats property as a separate investment class isolated from other assets, the contemporary techniques treat property as part of the larger investment community. The basis of this treatment is the equated yield.

3. Methodology

The target population for the study is residential investment properties in Uyo, Nigeria. These residential properties comprise flats, maisonettes and tenements. A total of 400 residential investment properties in Uyo were randomly selected for data collection using questionnaires.

Out of these, only 348 residential properties were accessed for data collection. Data collected include data on current rents paid on the properties and data on rental levels in the properties for the period, 1990-2005. Intervals of rent reviews in the properties were observed .

Case Study

A block of 3 No. three-bedroom flats situated in Ewet Housing Estate in Uyo, Nigeria, is let on ground lease from the freeholder with 45years unexpired term. The holder of the Certificate of Occupancy issued by the government pays a ground rent of ₦1, 000 p.a which is subject to growth at 5% and 3 years reviews.Current ground rent is ₦1, 500 p.a and next review of ground rent is due in 2 years. The property has a total rent of ₦ 450,000 p.a which is exclusive of all liabilities except repairs. Current rack rental value is ₦600, 000 p.a. Rental history shows that the most predominant reviews for similar properties is at 5 years interval. The current rent on the property is due for review in 3 years time. Similar rack-rented freehold properties sell for capitalisation rate of 6% when let on the basis of 5-year rent reviews. Further details reveal that repairing liability is ₦30, 000 and increases at a rate of 7%p.a. Yield on gilt-edged stocks are 13%. Value the freehold and leasehold interests.

4.Data Analysis

Recent market data collected in Uyo, another city in Nigeria and which are analysed and used for this study comprised data on 3bedroom semi-detached flats and maisonettes as presented in Table 1 and Table 2. Using 1990 as the base year, rental index was constructed for the properties for the period, 1990-2005 as presented in Table 3. Result of the rental index analysis shows that residential flats and maisonettes in the city maintained upward trends in rental values for the period, 1990-2005. This is due to annual growth in inflation among other factors such as shortage of accommodation and increased population pressure on available housing stock.

Accommodation in Uyo is grossly inadequate. The increase in the population of city arising from the constant influx of people from other parts of the state in search of greener pastures has exerted great pressure on the available housing stock, thereby resulting in rental increases by residential property owners. Also, rental values of flats and maisonettes increased annually at different rates, but the differences are not statistically significant.

Data analysis on rent review frequency in the city as presented in Table 4 shows that most review in residential properties in the city are between 2 and 3 years, representing about 79.89% of the intervals observed. The expected rent review pattern is 2.9366 years (say 3 years).

TABLE 4

Expected Rent Review Pattern in Residential Properties in Uyo, Nigeria

Rent Review Pattern (in years)	Frequency	(%) Occurrence	Probability	Expected Rent Review pattern
2 years	123	35.35	0.3535	0.7070
3 years	155	44.54	0.4454	1.3362
4 years	45	12.93	0.1293	0.5172
5 years	19	5.46	0.0546	0.2730
6 years	6	1.72	0.0172	0.1032
Total	**348**	**100**	**1.0000**	**2.9366** Say3years

The short rent review frequency is due to the anticipation of future value change and the possibility of growth in the future rental value over present rental value, an indication of the effect of inflation on real property incomes in Nigeria.

Conventional Technique

a) Freehold Valuation

The equivalent yield model is adopted for the conventional freehold valuation as follows:-

Ground Rent	₦1,000 p.a			
YP 2 yrs @ 6%	1.833	₦1,833		
Reversion to current ground rent	₦1,500 p.a			
YP 43 yrs @ 6%	15.3			
PV 2yrs @ 6%	0.89	₦20,426		₦22,259
Reversion to estimated rental value (net)	₦570,000 p.a			
YP perp @ 6%	16.6667			
PV 45yrs @ 6%	0.0727			₦690,651
	Valuation			₦712,910
			Say	₦713,000

B) Leasehold Valuation

A margin of 1% is added to the initial yield for the conventional valuation of leasehold interest as follows:-

Rent Received	₦450,000 p.a	
Ground Rent	1,000 p.a	
Repairs	30,000 p.a	
Profit Rent	₦419, 000 p.a	
YP 3yrs @ 7% & $2^1/_2$% tax 40%	1.6345	₦684, 856
Reversion to Current Rental Value	₦600, 000 p.a	
Ground Rent	1,000 p.a	
Repairs	30,000 p.a	
Profit Rent	₦568, 500 p.a	
YP 42 yrs @ 8% & $2^1/_2$% tax 40%	9.7276	
PV 3yrs @ 8%	0.7938	₦4,389,826
	Valuation	₦5,074,682
	Say	₦5,075,000

Contemporary Technique

The Real Value/Equated Yield hybrid model is adopted for the valuation. In order to get the inflation risk free yield (i), the equated yield (e) and the implied annual rental growth (g) must be determined. The equated yield is assumed to be 2% over yield on gilt-edged stocks and is 15%. The implied annual rental growth rate is calculated as follows:

$$k = e - \left[\left\{ \frac{e}{(1+e)^t - 1} \right\} x \; p \right]$$

Where k = initial yield
e = equated yield
p = rental growth over the whole review period
t = rent review interval

$$0.06 = 0.15 - \left[\left\{ \frac{0.15}{(1.15)^5 - 1} \right\} \times p \right]$$

$$\begin{aligned} 0.06 &= 0.15 - 0.1483p \\ 0.1483p &= 0.09 \\ p &= 0.6069 \\ p &= 60.69\% \text{ (rental growth over 5years)} \\ \text{But } 1 + p &= (1 + g)^t \\ g &= t\sqrt{1 + p} - 1 \\ g &= 5\sqrt{1.6069} - 1 \\ g &= 0.0995 \\ g &= 9.95\% \text{ (annual rental growth rate)} \end{aligned}$$

The inflation risk free yield on freehold interest is analysed as follows:

$$i = \frac{1 + e}{1 + g} - 1$$

$$i = \frac{1.15}{1.0995} - 1$$

$$i = 4.59\%$$

For capitalising the annually rising repairing liability for the freeholder, the growth-adjusted yield is analysed as follows:

$$i = \frac{1 + e}{1 + g} - 1$$

$$i = \frac{1.15}{1.07} - 1$$

$$i = 7.48\%$$

The inflation risk free yield on ground rent is:

$$i = \frac{1 + e}{1 + g} - 1$$

$$i = \frac{1.15}{1.05} - 1$$

$$i = 9.52\%$$

Freehold Valuation

Ground Rent		₦1,000p.a	
YP 2 yrs @15%	1.6260		₦ 1,626
Reversion to current ground rent		₦ 1,500 p.a	

YP 3yrs @ 15% x YP 43yrs @ 9.52%
YP 3 yrs @ 9.52%
= 9.3703

PV 2 yrs @ 9.52%	0.8337	7.812	₦ 11,718	₦13,344

Reversion to Estimated rental Value ₦600,000p.a

YP5yrs@15% x	YPperp @ 4.59% / YP5yrs @ 4.59% = 16.6667			
PV45yrs@4.59%	0.1327		2.2120	₦1,327,200
				₦1,340,544

Less Repairs:
Repairing ₦30, 000p.a

YP1yr @15% x	YPperp @ 7.48% / YP1yr @ 7.48%	12.5		375,000
			Valuation	₦965,544
			Say	₦966,000

Leasehold Valuation
To account for the extra risks in leasehold investments, an extra 2% is added to the freehold equated yield to arrive at the equated yield for leasehold interest. This has already been analysed and proved (Gane, 1995). Thus, the inflation risk free yield on leasehold interest is analysed as follows:-

$$i = \frac{1+e}{1+g} - 1$$

$$i = \frac{1.17}{1.0995} - 1$$

$$i = 6.41\%$$

Inflation risk free yield on ground rent is

$$i = \frac{1+e}{1+g} - 1$$

$$i = \frac{1.17}{1.05} - 1$$

$$i = 11.43\%$$

For capitalising the annually rising repairing liability for the leaseholder, the growth adjusted yield is:

$$i = \frac{1+e}{1+g} - 1$$

$$i = \frac{1.17}{1.07} - 1$$

$$i = 9.35\%$$

Valuation

Term income (Repairs inclusive)		₦ 450,000p.a		
YP 3yrs@ 17%		2.2094	₦ 994,230	
Reversion to Current Rental value		₦ 600,000p.a		
YP 5yrs@ 17%	x YP42yrs @ 6.41% YP5yrs @ 6.41% = 11.1007			
PV 3yrs @ 6.41% 0.83		9.2136	₦5,528,160 ₦6, 522,390	
Less:				
Ground Rent		₦1,000p.a		
YP 2yrs@ 17%	1.5853		₦ 1,585	
Reversion to Current Ground Rent ₦1,500p.a				
YP 3yrs@ 17%	x YP42yrs @ 11.43% YP3yrs @ 11.43% = 7.4609			
PV 2yrs @ 11.43%	0.8054	6.009	₦9,014	
Less:				
Repairs		₦ 30,000p.a		
YP 1yr@ 17%	x YP45yrs @ 9. 35% YP1yr @ 9.35%	9.8179	₦294,537	₦305,136
			Valuation	₦6,217,254
			Say	₦6,217,000

5. Discussion

The conventional and contemporary techniques of this paper are summarised in Table 5 as follows:

Table 5
Summary of Valuation for the case study

Nature of Interest	Valuation		Differential (₦)
	Conventional (₦)	Contemporary (₦)	
Reversionary Freehold	713,000	966,000	253,000
Leasehold	5,075,000	6,217,000	1,142,000

Table 5 shows results of the valuation of reversionary freehold and leasehold interests comprised in the case study using the conventional and contemporary valuation techniques. There are wide differences between the two valuations. These differences arise as a result of the inadequacy of the conventional technique in handling complex valuation problems involving rental gearing and rent reviews. In the valuation of reversionary freehold, the equivalent yield model uses the all risks yield which is a growth implicit yield in the valuation of the fixed term of the ground rent. This is erroneous. The contemporary technique corrects this error by using fixed income yield (equated yield) in the valuation of the fixed term of the ground rent. The inadequacy of the conventional technique is more obvious in the valuation of leasehold interest as it cannot separate fixed profit rents from variable profit rents, thereby enhancing arithmetical errors associated with variable profit rents in such valuation. Generally, conventional technique ignores rental gearing and rent review intervals in the valuation of the reversionary freehold and leasehold interests in the case study and particularly assumes no growth in repairs on the building whereas repairing liability on the building is explicitly growing at 7% annually. The contemporary technique handles these problems effectively by identifying fixed and variable rental incomes and fixed and

geared ground rents and applies appropriate yields accordingly. It also treats explicitly growing repairs and ground rents separately by deducting capitalized repairs and capitalized ground rents from the capitalized gross income. Based on the results of the valuation using the two methods and considering the complexity of gearing in the case study, contemporary technique produces logical, sound and better valuation than the conventional technique.

6. Conclusion

The traditional or conventional property investment valuation technique cannot interpret the realities of the Nigerian residential property market. This is because the technique cannot treat future value changes in its computation. With frequency of rent reviews on the building and provision for payment of ground rent in the Nigerian Land Use Act, which is subject to reviews, the conventional valuation technique becomes inadequate as it cannot handle complex rental gearing as seen in the case study. This makes the adaptation of contemporary models of property investment valuation to the Nigeria situation inevitable. Again, Nigeria's Land use Act vests absolute ownership of land in the government. The implication of this is that the government alone holds freehold interest in land in Nigeria together with reversionary freehold interest. Individuals merely hold statutory rights of occupancy for periods up to 99 years which to all intents and proposes are not leasehold interest. The equivalent yield model may not produce a logical valuation of the reversionary freehold interest. This is because the model uses growth implicit yield for the valuation of the fixed term income. A constant annuity in perpetuity, also known as the years purchase (YP) in perpetuity can take account of rent reviews in valuations. This is possible in fully-let freehold valuations. The freehold interest in the case study is a reversionary freehold interest, comprising the term and the reversion. Using a constant annuity in perpetuity for the valuation of the term and reversion incomes as a single income stream would result in erroneous valuation. The main conclusion of this paper is that, contemporary property investment valuation techniques are realistic and can be adapted for the valuation of residential investment properties in the context of the Nigerian land tenure system. The paper has shown the adaptation of one of these techniques in the valuation of the freehold and leasehold interests comprised in the case study.

7. References

Aluko, B.T., (2004), Market Data for Better Valuation/Pricing: The Holy Grail of the Valuation Profession, *The Estate Surveyor and Valuer*, Vol. 27, No.1, pp 54 63.

Baum, A. and Crosby, N. (1988), *Property Investment Appraisal*, London, Routledge

Baum, A. and Mackmin, D. (1989), *Income Approach to Property Valuation (3e),* London, Routledge.

Crosby, N. (1986), The Application of Equated Yield and Real Value Approaches to Market Valuation, *Journal of Valuation,* 4: 158 69, 261 74.

Daly, J; Jenkins, D. and Gronow, S. (1997), Buyer Behaviour, *The Valuer*, Vol. 66, No. 1, pp 14 15.

Enever N. (1986), *The Valuation of Property Investments (3e),* London, Estates Gazette.

Gane, D. (1995), A DCF Analysis of Market Price for Leasehold Investments, *Journal of Property Valuation and Investment,* Vol. 13, No. 3, pp 42-52.

Hargitay, S.E and Yu, S.M. (1993), *Property Investment Decisions: A Quantitative Approach,* London, E & F. N. Spon.

Ifediora, B.U. (2005), *Valuation Mathematics for Valuers and Other Financial and Investment Analysts*, Enugu, Immaculate Publications Ltd.

Igboko, N.P. (1992), *Research Project on Valuation Methods in Nigeria with Special Reference to Years' Purchase,* Lagos, Nigerian Institution of Estate Surveyors and Valuers.

McIntosh, A.P.J. (1983), The Rational Approach to Reversionary Leasehold Property Investment Valuations, in Chiddick D. and Millington, A. (eds), *Land Management: New Directions,* London, E.&F. N. Spon

Omuojine, E.O. (1994), Property Market in Nigeria: Analysis and Perspective, *The Estate Surveyor and Valuer,* Vol.18, No.1, pp. 15 21.

Sykes, S.G. (1983), Property Valuation, Investment and Risk, in Chiddick, D. and Millington, A.(eds), *Land Management: New Directions,* London, E. & F. N. Spon.

Trott, A. (1980), *Property Valuation Methods: Interim Report,* London, Royal Institution of Chartered Surveyors and Polytechnic of the South Bank.

Udo, G.O. (1989), Modern Techniques of Property Investment Valuation: The Nigeria Response, *The Estate Surveyor and Valuer*, Vol. 13, No.1, pp 19- 24.

Udo, G.O. (1998), Should the Years' Purchase Be Blamed for Inaccurate Property Valuations? *The Graduate Estate Surveyor,* Vol.3, No.1, pp 411, Department of Estate Management, University of Nigeria.

Udo, G.O. (2003), *Model Building in Property Valuation,* Enugu, Institute for Development Studies, University of Nigeria.

GUIDELINES FOR AUTHOR AND EDITORIAL POLICY

The Journal: The journal is biannual. The aim of the journal is to encourage scholarship in the area of built environment. It emphasizes the production of knowledge and exchanges of ideas.

Invitation of Articles: The Editor invites original and scholarly articles in the following areas: Land valuation and management; housing issues; Property Management; 2-D and 3-D Design and Graphic Communication and materials; Building Economics and Quantity surveying, legal and Dispute and Construction of Buildings; Building Science, materials and Structure; construction Plants and Technology; Rural and Urban Development and Planning; Transportation and Infrastructural Planning; Landscape Architecture; Interior Design, Ecology, Culture, Art and Architecture of Africa; Computer Applications in valuation, Design, Management and Planning; Information Management and Sustainability in Built Environment.

Acceptance of Articles: Once an article is submitted for publication, the author shall not submit it caption elsewhere.
Caution: It should be noted that the opinion expressed in any articles, book review or commentary appearing in any issue of the journal does not reflect the opinion of the Editorial Committee.

Editorial Procedure: Contributors need to ensure that their manuscripts conform to the editorial guidelines noted below. Initially every contribution will be given a general editorial reading. Manuscripts, which conform to the editorial policy are subjected to peer review. However, the final decision to accept or reject a manuscript for publication is the responsibility of the Editorial Board.
Content of the Manuscript: The manuscript must apply systematic procedures to discover answers to research questions. Authors must conduct empirical investigations on any subject written.

Submission of the Manuscripts: Authors should submit four copies of their contribution, typed and double-spaced on A4 210 x 297mm paper. Author (s) must also provide a diskette containing the camera-ready copy, formatted in Ms-word.

Size of Manuscripts: Authors should provide an abstract of not more than 130 words inclusive of key words. Manuscripts must not exceed 6,000 words or 25 typed and doublespaced pages. Articles exceeding this limit will normally not be accepted. Book reviews should not exceed 1,000 words in length. The editor also welcomes any comments of not more than 200 words on the content of any of the articles in any past issues of the journal. The first page of the article should bear the title of the paper, the name and address of the author and his or her affiliation(s). The second page should bear the title, followed by the main body of the text.

References: Havard style is used. In the body of the text, references are placed between parentheses and contain the last name of the author, the year of publication and the pages (s) to which one is referring to. For example:

The work of Rukwaro (1977) was concerned with the cultural change of the Kenyan Maasai.
"Gradually, they leant to conform with, and even accept, British rule, but theirs remained a bitter lesson, one never to be forgotten" Muriuki, 1974 p. 167). More than one page is abbreviated as (pp.) In case of four or more authors to a source, use the name of the first author from the title page) followed by 'et al' or 'and others'. e.g olima et al. (1996).

Bibliography: The bibliography should appear at the end of your work and is organized alphabetically. In the bibliography, references should be listed by the last name of the author followed by his or her initials and the date of publication, title, publishers, place of publication as follows;

Book References

E.g. Muthini, Mbatha (1993) Management of Building Project: Analysis of Building. Procurement Systems' Features and Conception of An Appropriate Project Management System for Kenya. Wuppertal, DVP-Verlag.

Journal articles

E.g. Olima, W.H.A. (2002). The Conflicts, Shortcomings, Implication and the Urban Land Management System In Kenya. Habitat International. 21(3) pp.319-331.

Conference Paper from Conference Proceedings

e.g. Wachira, I.N. (2003) Informal Construction

workforce phenomena. In: Construction Innovation and Global Competitiveness, 8-15 August, New York CRC Press, pp. 1295-1308.

Electronic Journal Articles

e.g. Smith, J. (1996) Time to go home. Journal of Hyperactivity [Internet] 12th October, 6 (4), pp. 122 - 3. Available from: http://mu.ac.uk [Accessed June 6th, 1997]

Appendices: Appendices should follow immediately after the main text.

Tables: Tables should be numbered and submitted on separate sheets, or as different files on the diskette, with their location being noted in the text. Each table should have a brief descriptive title and source, both of which should appear in lower case. They must be in camera-ready from suitable for reproduction without modification.

Illustrations:Illustrations should accompany the manuscript. All maps, diagrams, charts and photographs should be referred to as "figures" and should be numbered sequentially in the order in which they are referred to in the text. All figures should have brief descriptive captions and sources also should be cited. All illustrations must be camera ready photographs and should be good quality glossy prints preferably whole plate (212.5 x 165.5mm). Each should have the authors name and figure number, all written lightly in pencil at the back of the picture. Line drawings should be in black and should be in a form suitable for reproduction. The editor reserves the right to redraw illustrations. If requested, the Nairobi Habitat Review will return all illustrations to the authors, but will not be responsible for any damage that occurs when handling.

Off-print copies. Authors will receive a free copy of the issues in which their articles appear and five off-prints copies free of charge.

Authors should send their contributions to:

The Editor-in-Chief
Africa Habitat Review
School of the Built Environment
University of Nairobi.
P.O. Box 30197, Nairobi, Kenya.

Journal of School of Built Environment
Volume 1, Number 1. November 2006

Contributors