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Inaugural Lecture Series 59

MORE THAN SHELTER

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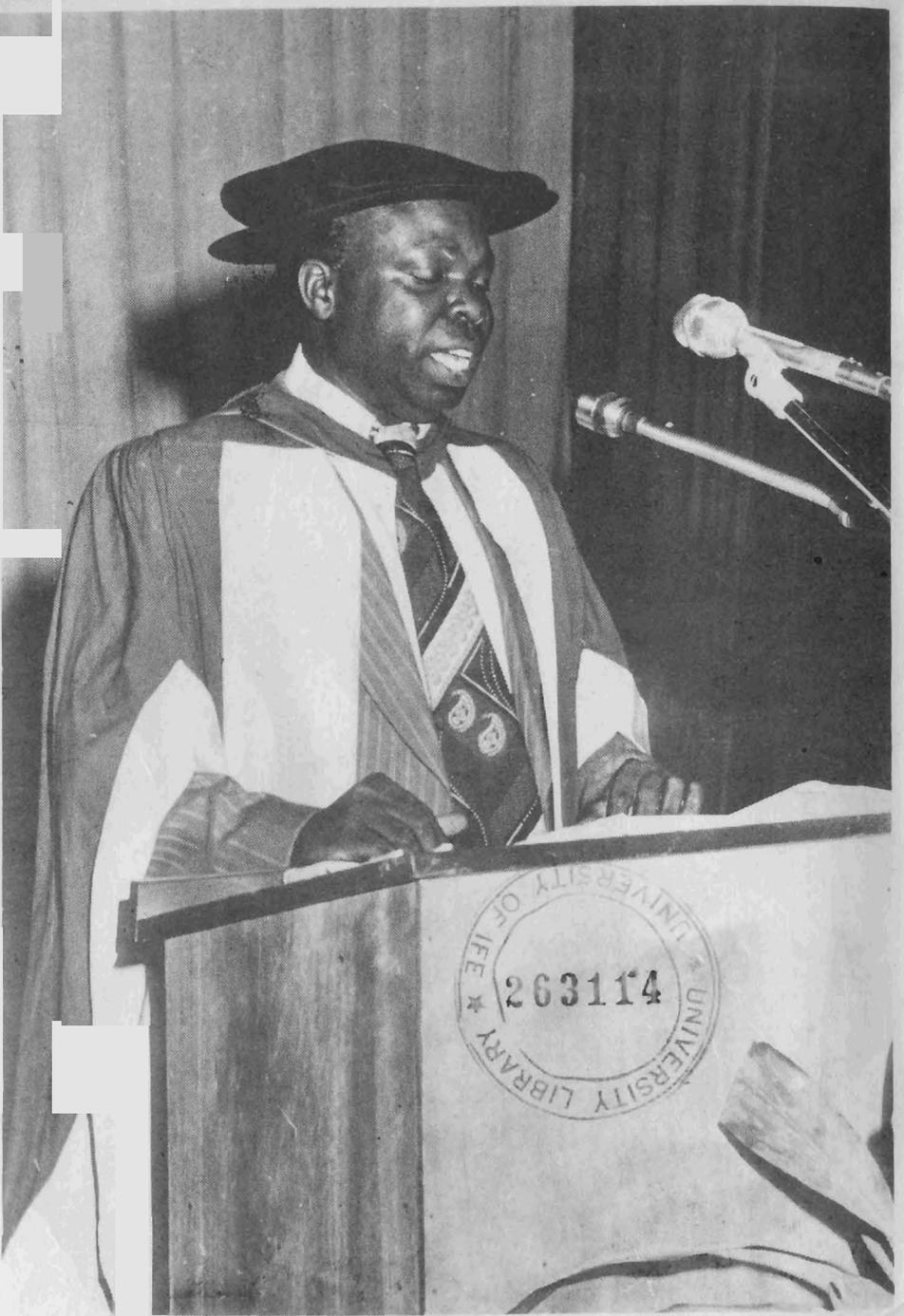
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By

Kunle Ade Wahab



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Kunle Ade Wahab
Professor of Building

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The building instinct is not limited to human beings; it extends over large number of species and types of living organisms. Even if we omit those animals which create their own dwellings from secretions made by themselves, like the shellfish or the spiders, the field of animal builders is still vast. A few fish build nest-like structures of weed; almost all birds construct nests of sticks and twigs and vegetable fibres (Plate 1); ants build elaborate excavated communal dwellings (Plate 2) . . . Beavers construct dams and houses with trees and branches they have cut down . . . The ability to erect adequate shelters against weather and enemies may be, in fact, the specific element which controls the survival of some species in the relentless struggle of evolutionary life.¹

I

The above quotation, taken from Talbot Hamlin's *Architecture Through the Ages* shows the vital importance of building in the living process. For the purpose of this lecture, building will be further defined as an enclosed space that is intended to be permanent or at least to last for a considerable time and big enough for human habitation. It is usually conceived, constructed and maintained by man to create within it a micro-environment to satisfy his basic needs. In addition, any building represents a statement of hope for the future. Since it is a response to material and geographical necessities, religious beliefs, social systems and economic conditions, a building is more than mere shelter. Various needs lead to different types of buildings, namely, residential, religious, civic, commercial, industrial, military, among others. According to Nikolaus Pevsner, the world famous architectural historian, when a building is designed with a conscious aesthetic appeal, it is called "architecture".² Aesthetic appeal can be generated by the treatment of the exterior, the relationship of the parts to the whole and the quality of the interior space.³

The history of what we know today as building can be traced back to prehistoric times when primitive man lived in the cave. As he became more civilized and increasingly conscious of the potentialities of the natural resources in his immediate environment, he made conscious attempts to duplicate the



PLATE 1— A typical bird's nest constructed with sticks, twigs and vegetable fibres. This is self effort — a challenge to men!



PLATE 2— A tall ant hill; The ants being miniature insects build their equivalent of skyscrapers. Within it one finds an elaborate structure of status quo from kings to ordinary insect folks.

shelter of the cave in form of buildings, the material varying from one geoclimatic region to another. Buildings in the cold and temperate regions are designed to keep the interior warm, while those in the tropics are designed to keep the interior cool. The main building materials are mud, clay, dried and burnt bricks, timber, stone, marbles and concrete. Since the beginning of this century glass, plastic and steel have become fashionable, these (in addition to concrete) allowing for taller buildings, otherwise known as sky scrapers (Plate 3).



PLATE 3 — These three 20 storey blocks of flats are owned by the Lagos State Government, on an Estate in Victoria Island of Lagos Metropolis.

Each building must be properly designed to satisfy functional requirements, the most important of these being structural stability, dimensional stability, thermal comfort, sound insulation, fire protection, weather exclusion, durability, lighting, ventilation, safety and general privacy. Structural stability for example demands a safety margin in design which, while ensuring safety, is not so excessively high in cost as to be uneconomic. Fire protection covers, among other things, emergency escape for occupants and principles of compartmenting or localising fire within the place of occurrence. The alarming frequency with which fire outbreaks have been occurring and the ease with which important buildings have been destroyed in the country of late suggests that the requirement of fire protection has not been given adequate attention! As at today public buildings gutted by fire include the Republic Building; the Ministry of Education, Race Course Lagos; the General Post Office, Marina, Lagos; the Accounts Section of the new Federal Capital at Abuja; and the NET Building, Marina, Lagos.

In early times, building was a communal activity. Since there were no specialist builders, the construction of a family house was the joint responsibility of the members of the family. On the other hand, the construction of civic

buildings such as town halls, palaces, churches and fortresses was the responsibility of all or selected members of a given community. In the course of participating in many building projects, certain individuals soon acquired special skills which set them apart from their fellowmen. The recognition of such skills by members of the community led to these individuals being hired as professional builders. The first professional builder of recorded history was Imhotep, the grand vizier to King Zoser of Egypt who built the stepped Pyramid at Saqqara, Egypt about 2750 BC⁴ (Plate 4). Ever since,

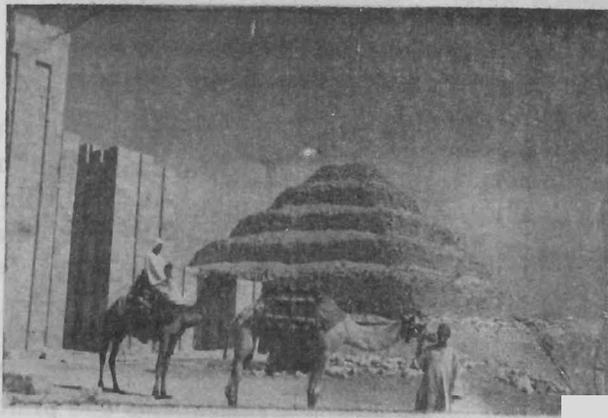


PLATE 4 — The Zoser's stepped pyramid built about 270 BC. Zoser has been acclaimed as the first professional builder.

more and more individuals have turned professional, constituting themselves into a guild during the Middle Ages and the various institutes or associations of builders all over the world today. For example, the Chartered Institute of Building in U.K. was established in 1834 and that of Nigeria in 1968.

In the past, a builder was trained through the apprenticeship method which enabled the trainee to learn on the job, in the process of participating in several projects. He became a professional after satisfying his master who in turn gave him a certificate of competence. Today, the training of a builder is a far cry from the days of apprenticeship.

Building is now an academic discipline involving specialised training in the social and physical sciences. Six Nigerian universities, University of Ife, Ahmadu Bello University, University of Jos, University of Benin, University of Lagos, and University of Ilorin; now run degree courses in building. In actual fact, building as an academic discipline began at Massachusetts Institute of Technology, Union and Yale Universities, all in the United States of America in 1926.⁵ Its main branches are building materials involving research into and development of raw materials; building technology, which involves assembly techniques; structural design which is concerned with structural stability; building economics, which deals with cost-effectiveness; construction management, which is concerned with the techniques of optimising use of resources; building finance, which involves raising of funds, management of cash flow and accounting; estimating, which involves the prediction of uncertain future cost trends; building maintenance, involving the general maintenance so as to prolong the lives of buildings.

At this juncture, it needs to be pointed out that the builder is only a part, although a very important one, in the building process. The modern building is a product of the efforts of many professionals whose contribution can be briefly summarised in the following paragraphs.

The architect designs the proposed building on paper in terms of its spatial orientation, physical form and aesthetic appeal. The aesthetic considerations are sometimes overdone. When this happens, costs can be excessively high as the Sydney Opera House has shown* (Plate 5)! The planner ensures that the building is well located in terms of essential facilities. The land surveyor identifies the relative topography of the site. It is on the topography that both the architect and the planner base their own work. For commercial projects involving reasonably high investment, the estate surveyor is expected to provide the initial feasibility studies before the commencement of the architectural design. He also comments on the viability of the location.

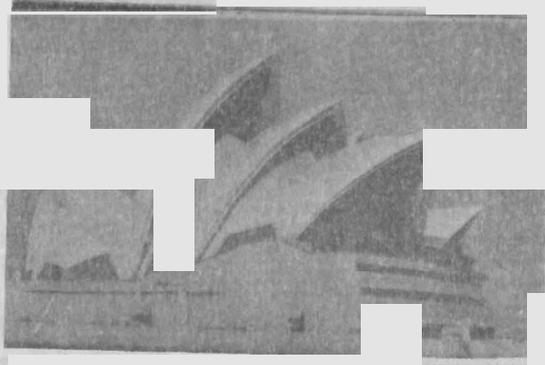


PLATE 5 — The celebrated Sydney Opera House — an Architectural monument that nearly ended as a dream due to escalated cost of achieving the aesthetic consideration.

The management of the project may also be entrusted to him. The quantity surveyor relates cost to design advising on the specification of materials and components. The emphasis is *to design to a cost* and not *to cost a design*. He is regarded as a kind of “accountant” in the building industry.

The structural engineer works closely with the architect to ensure stability. He must address himself to the interplay between such requirements as aesthetic and structural form, division of space, optimum cost solutions and provision for services’ runs. The services engineer is concerned with users’ comforts such as cooling, acoustics, as well as the lighting and plumbing of the building interior.

The professional builder is required in a variety of decisive roles within the building organisation. These are mainly in the area of middle and top management functions: estimating, buying, production planning, quality and cost control. Thus the dream of the client, conceptualised by the architect (Plate 6) is realised through physical construction by the professional builder. It is after this that critics and admirers can have a field day! Owing to the expertise which the professional builder possesses, the potential building owner may approach him for a speedy delivery of his building. Even when the formal procedure as described above is adopted,

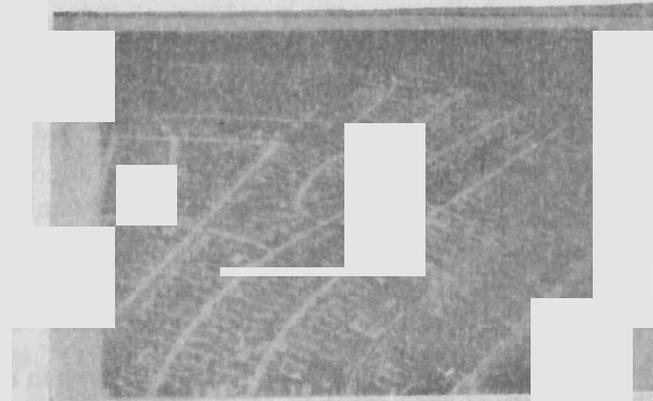


PLATE 6 — A layout plan of a realised housing estate. The adequacy of access roads can easily be noticed.

the experienced professional builder may offer alternative construction solutions to those provided by the architect. The professional builder is enabled to achieve his goal by the comprehensive nature of subjects he must study in the university. The major ones are building and architectural design; building construction and materials; theory of structures and strength of materials; structural design of concrete, timber and steel; measurement of building work; building economics, project planning and control; management of building projects; technologically advanced building processes, construction technology; soil mechanics; professional practice and productivity studies; and building maintenance management.

II

Apart from the strictly biological explanation for the evolution of man into a tool-maker and user, there can be no doubt that he made tremendous strides towards a total mastery of his environment once he settled down to organize community, creating villages, towns and cities. Through his building activities, man has transformed the surface of the earth into a wonderland of comfort and pleasure. The most important unit in human community is the

family occupying a building or house which provides the physical, psychological and social milieu for human development. It is the responsibility of all the professionals involved in building to see that not only are buildings well constructed and properly laid out, but also that they possess important services and facilities to link the individual and his family to the community. Such facilities should include water, light, sewage system, communication links, schools, hospitals, recreation centres, religious institutions and adequate transportation, among others.

In this Lecture, the first on the subject to be given in any Nigerian university, I shall focus on the present state of the building industry in Nigeria with a view to highlighting its problems, prospects as well as my own contributions as an academic.

The problems facing the building industry in Nigeria cannot be fully understood without some knowledge of its historical, cultural and geographical background. Like many other communities in black Africa, Nigerians have had to rely on minimal material resources to construct their houses. The Ijaw, Urhobo and other inhabitants of the Niger Delta have had to rely on bamboo, palm leaves and mangrove to construct their houses on their swampy terrain. To prevent their houses from being flooded by water, the houses are elevated on stilts (Plate 7). As one moves inland from the



PLATE 7 - Building on stilts is common in riverine areas of Nigeria. The working floor level is usually determined from the knowledge of the water level at the highest tide waves. The photograph is taken from "Aiyetoro" community of Ondo State of Nigeria.

coast notably among the Itshekiri, Isoko, Ijaje, the Kalabari and the Efik, the predominant building type is made of the wattle and daub. As the mud in the area is water-logged, the wall of the house is first made of wattle or woven bamboo, after which it is daubed or invested with mud — a method similar to the reinforced concrete of modern buildings.

In the rainforest belt, notably among the Edo, Yoruba, Ibibio and the Igbo, where mud is less water-logged and there is abundant timber, bigger rectangular mud structures can be encountered with the roof thatched with grass or dry leaves. One of the important features of the building of this area is the arrangements of four building units in a rectangular formation so that there is an open space or courtyard in the middle. To drain off the rainwater falling inside the courtyard, a hole is dug in the middle through which the water is tunnelled out of the closure. This type of building is popularly known as "impluvium". The courtyard also serves as play area for children during the day and a place of relaxation for older people in the evening. Another characteristic of the building in this area is the lavish use of carved house posts (Plate 8) and doors as prestige symbols in the houses of important personages.



PLATE 8 - Carved house posts which also serve as columns to support roof loads.

As we move northwards, most especially across the Niger-Benue confluence, the traditional building types change gradually from rectangular structures to round huts. These are arranged in a circle so as to enclose a series of inner spaces or courtyards. As the mud in the area is less water-logged and more plastic, the building walls are stronger and can be made higher than those of the "impluvium" house with minimal risk of collapse. This quality can be better appreciated in the rectangular "clay-box" houses of the Hausa of the northern savannah area, some of which are more than 4.5 metres (15ft) high. A special feature of the Hausa house (*Gida*) is the flat or domical clay roof which makes the use of thatch unnecessary. Another design feature of the building in this area is that windows are small and located at a level above the door not only to control the amount of light entering the house but also to keep air indoors as long as possible since this is usually cooler than the air outside.

As one moves out of the savannah into the Sahelian or semi-desert areas, (occupied by the sedentary and the nomadic Fulani) the housing type alternates between the rectangular and the circular, the striking feature being the big thatch roof. Resulting from their nomadic habits, the cattle-rearing Fulani do not construct permanent buildings, their favourite building materials being mats, hides and a few sticks which can be transported from one place to another. Notwithstanding their basic materials and simple technology, a good majority of traditional Nigerian buildings are more than shelter, as can be seen in their elaborate spatial orientation, formal articulation and artistic decorations.

A cursory look at the "extended" family system in many parts of Nigeria shows that each housing unit comprises in most cases, several married adults, brothers, sisters, nephews, aunts, uncles, the children — all tracing their origin to a common ancestor and also bound together by strong social and economic ties. New structures are added to the original building complex as the need arises, and until such a time

when there is no more space for expansion — in which case a branch of the family may have to be created elsewhere. The consequence of this social or kinship system is that in a typical traditional village or town, the houses are clustered together with only narrow lanes between them. As a matter of fact, this traditional settlement pattern continues to this day in the big cities such as Ibadan, Abeokuta, Kano, Aba, Jos and so on, constituting a major problem for town planners.

Although there have been foreign influences on traditional Nigerian buildings from time immemorial (two good examples being the influence of Islamic architecture on Hausa and Fulani houses and the Brazilian architecture on Yoruba houses in Lagos, Abeokuta, Badagry and Ibadan (Plate 9)),

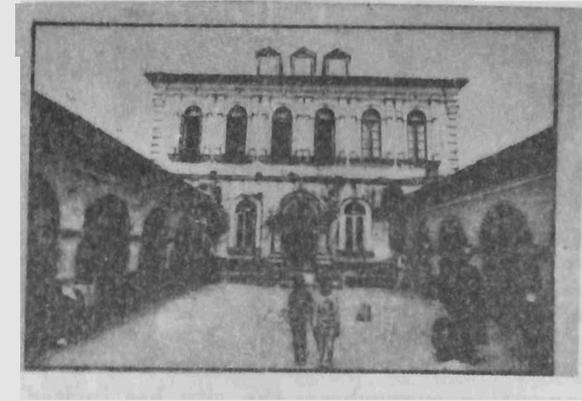


PLATE 9 — A Brazilian house located at Ifebu-Ode in the Ogun State of Nigeria. Some of the slaves who returned from the Americas possessed sophisticated techniques both in the building trades and craftsmanship. The returnees organised themselves into building activities and the home elites benefited as this picture shows. Brazilian houses can also be found in Nigerian towns and cities such as Lagos, Abeokuta, Ibadan, Ilesha.

the greatest single impact is traceable to the European colonisation of the country, dating back to the early part of the 20th century. European colonisation brought in its wake new social, religious and economic forces, destabilizing the traditional scheme of things. Urbanisation has disbanded the traditional family unit, causing many members to rush to

the big cities in search of jobs. Under the same wind of change, traditional buildings are giving way to new industrial projects which place special demands on the building industry and the professional builder in particular. Traditional shrines and other sacred structures have not been spared; some have been displaced by petrol stations and pool houses! Even the Oba's palace, sacred as it is, is now being encroached upon by commercial banks (Plate 10) and hostels! The



PLATE 10 – An Oba's palace completely hemmed in by over development in the city. On one side, there is a bank and on the other, commercial buildings. The large crowd of pedestrians and vehicles compete for the grossly inadequate spaces fronting the buildings.

general atmosphere in a typical Nigerian city is charged; there is congestion everywhere; the city has invited more adventurers than it can accommodate. Hence the housing problems, high rent, poor shelter, poor sanitary conditions, environmental pollution and the traffic chaos. (Plate 11), not to mention the other social ills most characteristic of our big cities.

In view of the special demands of the urban areas and the need for large enclosures for industrial and institutional uses, the traditional materials for building are no longer adequate. Neither are the traditional techniques of building. As a result, the building industry in Nigeria was dominated by expatriate firms until the late 1970s. The few indige-

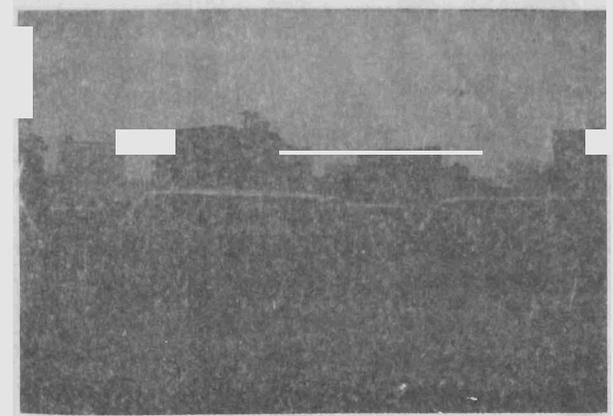


PLATE 11 – A typical traffic chaos in Ibadan, Capital of Oyo State of Nigeria.

nous builders in the field lacked the necessary equipment and expertise to handle big projects.⁶ In the end, they were, and even still are, obliged to sub-contract major projects to expatriate firms. One unfortunate aspect of the building industry in Nigeria is the existence among indigenous builders of fake professionals, or the so-called "emergency contractors" and "Alhaja contractors". These are usually unqualified individuals who are often encouraged by government officials and political parties for the purpose of receiving kickbacks. This has led to inflated estimates, shoddy jobs and consequently, waste of public fund.

Government efforts to provide adequate accommodation in the urban areas have been thwarted not only by these unpatriotic Nigerians, but also by the short-sighted policy of providing expensive housing for individuals whose income cannot sustain such a venture. Thus only a few houses get built out of the meagre resources available. Besides, most of the various resettlement schemes of the government have left much to be desired because of inadequate feasibility studies. A case in point is the Kainji Resettlement scheme where the government commissioned a foreigner to handle the project. The prefabricated structures which emerged

failed to respond to the climate of the area (Plate 12).



PLATE 12 — Kainji resettlement Project — Part of the prefabricated structures which resulted from using wrong experts for what requires intimate local knowledge for better cultural and realistic solutions.

They are too hot for human comfort. Unable to withstand the heat, many of the Kainji farmers abandoned the houses, converting them into a shelter for their cattle while they themselves sleep in the open air. The Surulere Resettlement (Plate 13) scheme in Lagos has been hampered by the



PLATE 13 — Surulere Resettlement Project. The one room houses allocated to each family uprooted from their abode in Lagos is un-African. The scheme lacked adequate facilities such as car park, recreation grounds, and waste disposal facilities to name a few.

lack of adequate infrastructures such as car parks, recreation grounds, laundry and waste disposal facilities. Irregular collection of refuse by the Public Health Department eventually led to the solidification of waste in the refuse chute linking the fourth floor to the ground floor, thus constituting a health hazard to the inhabitants. Other problems facing the government housing programme are the high cost of building materials, non-availability of land — in spite of Land Use Decree and poor managerial and technical performance of indigenous contractors.

The problem of over-crowding in our major cities have become a nightmare to planners. For example, in a 1972 survey of Mushin area in Lagos state, I discovered that 235 people live in a typical three storey tenement block containing 39 standard rooms of 3.6m x 3.0m. In other words, an average of 6 people live in one room. In the approved plan, there were to be two kitchens and two toilets/bathrooms on each floor. The landlord however converted one kitchen on each floor into lettable rooms, thus increasing the level of over-crowding and forcing tenants to use the corridor as cooking places. The situation is worse in Ajegunle area where as many as eight people occupy a single, sub-standard room. A curtain is normally used to demarcate the sleeping portion of the room from the living portion. At night, the children sleep on the floor and even under the bed, while their parents sleep on the bed shielded from the children by the curtain. These problems are such that only a drastic review of the housing policy of various governments can save the situation.

III

Apart from my involvement in the production of qualified professional builders for the industry in this country, I have conducted research with a view to helping the nation to solve some of its housing problems. As a specialist in building economics, construction management and materials (which I have taught for the past fifteen years), the main thrusts of

my research have been to find new ways of producing reasonable forms of housing for as many Nigerians as possible. In an attempt to find a solution to the perennial problem of housing shortage, the various governments in the country have engaged in a series of housing schemes, the bulk of which was for the senior civil servants. In some of my studies, I have evaluated these schemes. For instance, the First Six Year Development Plan (1962-68) mentioned housing as part of industrial estates, land acquisition and town planning. The total investment in this sector represented only 6.2% of the total budget. Koenigsberger⁸ indicated that as much as 61,000 units were needed at that time to enable meaningful solution to be sought. Unfortunately, only 500 units were built by the federal government before the out-break of the Civil War in 1967. The private sector which could have supplemented the government's efforts were investing largely in expensive and sophisticated houses for foreign firms, embassies and the upper class.

The Second National Development Plan (1970-74) indicated only marginal improvements in the government efforts to provide housing for both civil servants and the general public. The Third National Development Plan (1975-80) while justifying its intervention in the housing market as follows merely identifies the problems:

Private investment in housing has been growing too slowly to be able to meet the demand because of well known problems and bottlenecks such as insufficiency of private savings, inadequate credit facilities, the high cost and difficulties of obtaining land in some centres and the recent sharp increase in the cost of building materials.⁹

Although the government embarked on large-scale public housing schemes particularly for the low income group (Plate 14), the standard of space and quality adopted far out-paced their actual economic situation. For example, the floor area for dwelling in 9 countries¹⁰ averaged 31m², 58m² and 100m² for low, medium and high incomes respec-

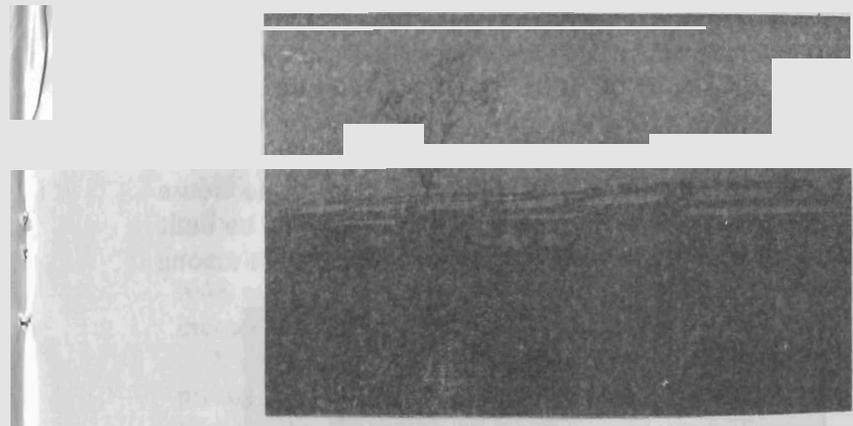


PLATE 14 — Federal government low income housing. At the time of the lecture only a negligible number of the houses have been built. Even these have not had any forms of infrastructure in the estate.

tively. In Nigeria the comparative figures are 50m², 80m² and 200m². The reason for the high standards can be attributed to so many factors.¹¹ These include the value judgement of designers who often adopt foreign specifications due to their foreign training; the value judgement of politicians who are eager to show foreign visitors prestige projects indicating that we have "arrived" economically, socially and otherwise; the inability of the government to relate dwelling costs to what the prospective occupier can afford to pay for rent or purchase.

The government imposition of rental ceiling or what is popularly known as "rent control" has been largely ineffective because the demand for houses far exceeds the supply. Credit facilities offered by the Federal Mortgage Bank of Nigeria are simply inadequate. Besides, these facilities are enjoyed mostly by people in the high income group. Notwithstanding the government's investment in the local production of building materials such as cement, asbestos and steel, these commodities are in short supply. Paradoxically, their prices are much higher than those of the imported ones.

My studies¹² have shown that state responsibility for direct housing construction (to let or sell) is an evil which should be discouraged. It is expensive because it adopts too high a standard of space and quality. It is wasteful in that it costs several times what the individual can afford; it magnifies the immorality of contracting, since the same house would almost certainly cost much less if it were to be built privately (Plate 15). It encourages complacency among

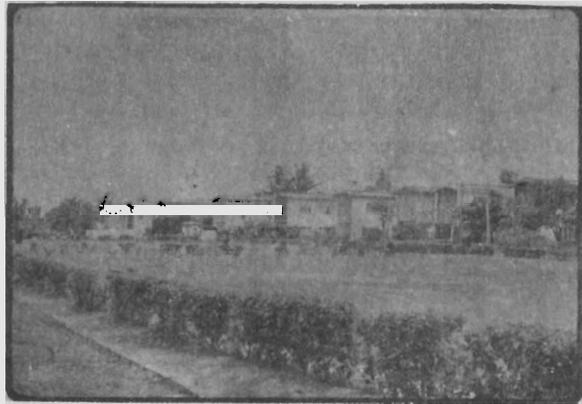


PLATE 15 — Housing for the middle and high incomes are too elitist. They are several times the income of occupiers who should and could afford to build their own houses.

people who could easily fend for themselves either individually or collectively. It creates unnecessary bottle-necks in the course of implementing such schemes. It is elitist since most of the houses which come from such policies fall easily into the hands of middle and upper income groups who can afford to build their own houses.

The plight of the masses would be less acute today if the allocation of resources for housing had not been biased against them. For example, in the Third National Development Plan for which figures are available, the government proposed that 80%, 17% and 3% of all the housing units should be allocated to the low, medium and high income groups respectively. The government then went on to allo-

cate the number of houses to be built as follows: 73,240, 15,385 and 3,000 for the low, medium and high income groups while adopting unit costs of ₦12,500, ₦26,000 and ₦100,000 respectively. Quite apart from these over-generous costing, the government should have allocated the total funds of ₦1,615 million in direct proportion to each income group rather than the housing units. This would have produced the corresponding figures of ₦1,292 million, ₦275 million and ₦48 million for each income group respectively and the low income group would have had 41% more housing units.

A good majority of the housing schemes initiated by the private sector for the low income group lack essential facilities: electricity supply is inadequate; only a few water stand-pipes are located along the main road. People living some distance from the main roads content themselves with dug shallow wells; gabbage/refuse collection is grossly inadequate; toilets are largely in the form of pit latrines or the pail system. In other cases, bushes and isolated/undeveloped plots serve as public toilets and dumping grounds, thus endangering the lives of the inhabitants. The inevitable conclusion that one can draw from the foregoing is that, large scale as the government housing programme might have been, it is inadequate because the proposed housing project of 200,000 units in the Third National Development Plan is only 22 percent of the projected shortage of 867,316 units at the end of that plan.

In several of my publications, I have shown how the cost of housing can be brought within the reach of both the rural and the urban population.¹³ The method I have adopted is to examine all the factors affecting house cost, put up a design, construct the dwellings and then compare the costs with my original budget. One of the case studies was undertaken to obtain an approximate cost of housing the middle income group. The features of each dwelling include a garage, a recessed frontage (verandah), a hall, a lounge/dining room, a kitchen, three bedrooms, a toilet and a bathroom. Amenities provided include a ceiling fan, hot water

system, soil drainage by means of septic tank and soak-away pit, and open drains for waste water. The house has a sandcrete wall, rendered and painted; asbestos roofing, P.V.C. floor tiling on cement screed, louvred windows screened with mosquito proofing, conduit wiring and several socket outlets. The actual cost per unit was ₦4,460 in 1974. However the cost did not include 10% professional fees and 20% contractor's charges. My approach in this and similar projects is to provide the basic requirement, suited to our needs and circumstances.

In another major study, I have developed a housing concept which relates the resources of the prospective owner-occupier to the floor area and quality of his accommodation.¹⁴ This concept is called "Income Multiplier and Affordable House Cost". Income multiplier is a constant by which the income is multiplied to obtain the maximum house cost for a rate of payment expressed as percentage of income over a period of years, at a rate of interest on the loan.

Income multiplier is given by the following equation:

$$\text{Income multiplier} = \frac{2ni}{200 + r(n + 2)}$$

where n = number of years for repayment (e.g. 20)

i = percentage of income as repayment (e.g. 25)

r = interest rate as percentage (e.g. 7)

For example if the percentage of income as repayment and the interest rate as a percentage of-outstanding loan remain constant at 25 and 7 respectively, the income multipliers for a number of years to repay the loan at 10, 15, 20 and 25 years would be 1.76, 2.35, 2.82 and 3.21 respectively.¹⁵

Table 1 shows the income distribution in the University of Ife as at December, 1982, Table 2 shows the application of the income multiplier and affordable house cost, and Table 3 shows a recommended guide to space selection for housing development.

Table 1

**Income Distribution in University of Ife,
Ife – Ife, December, 1982.**

USS	Income in Naira	No. of People	Percentage	Distribution
01	1560 – 1776	1117	20.80	
02	1620 – 1908	950	17.70	
03	1920 – 2424	875	16.31	
04	2436 – 3084	520	9.69	
05	3120 – 3912	382	7.12	71.64
06	4008 – 5016	171	3.19	
07	5136 – 6216	235	4.38	
08	6336 – 7488	226	4.21	
09	7550 – 8040	220	4.10	
10	8148 – 8868	18	0.34	
11	9000 – 10,080	299	5.57	21.78
12	10,092 – 11,352	45	0.84	
13	11,364 – 14,820	211	3.93	
14	12,734 – 14,052	21	0.39	
15	14,280 – 15,720	76	1.42	6.58
TOTAL		5366	100.00	100.00

Table 2

Application of Income Multiplier and Affordable House Cost

Income Multipliers for determining House Costs for Various levels of repayment over a period of years at 6½% of Interest on Loan

Years of Repayment	Percentage of Income as Repayment	House Cost Income Multipliers
10	20	1.44
10	25	1.80
10	30	2.16
15	20	1.88
15	25	2.35
15	30	2.82
20	20	2.20
20	25	2.76
20	30	3.31
25	20	2.44
25	25	3.05
25	30	3.66

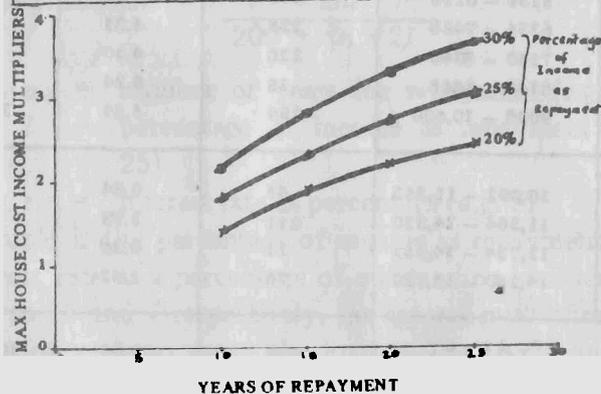


Table 3

A Guide to Space Selection for Housing Development

Recommended dimensions	ROOM FUNCTIONS										
	B/R	L/R	D/N	KIT	ST	PAS	T/T	B/S	B/T	VRD	W/R
0.6 X 2.4											S
0.6 X 3.6											S
0.6 X 4.8											S
1.2 X 1.2					S	S	S	S			
2.4 X 1.2					S	S	S	S	S		
2.4 X 2.4					S	S		S	S	S	
3.6 X 1.2					S	S	S	S	S	S	S
3.6 X 2.4				S	S	S				S	
3.6 X 3.6	S	S	S								
4.8 X 1.2					S	S					S
4.8 X 2.4					S						
4.8 X 3.6	S	S	S	S							
4.8 X 4.8	S	S	S								
6.0 X 1.2							S				S
6.0 X 3.6	S	S									
6.0 X 6.0	S	S									
7.2 X 1.2							S				S
7.2 X 3.6	S	S									
7.2 X 4.8	S	S									
7.2 X 6.0					S						
7.2 X 7.2					S						
8.4 X 1.2							S				S
10.8 X 1.2					S						S
Minimum	IS	O	O	IS	IS	IS	O	O	IS	IS	IS
Maximum	4S	IS	IS	IS	2S	3S	2S	IS	IS	3S	4C

Keys:

- S = selectable
- B/R = bedroom
- L/R = living room
- D/N = dining room
- KIT = kitchen
- ST = store
- PAS = passage or corridor
- T/T = toilet
- B/S = bathroom or shower
- B/T = bath and toilet (W/C)
- VRD = verandah
- W/R = wardrobe

The range of income distribution shown in Table 1 is probably an indication of what can be expected nationally. With this assumption, funds for housing can be allocated in the proportion of 71.64%, 21.78% and 6.58% for the low, medium and high income groups respectively. Thereafter, I suggested that housing can be provided for all, using any of the following housing principles.

If there is only one quality standard (principle one), the owner-occupier should be allocated space according to what he can afford. It is however prudent to adopt at least three different designs, one for each income group (principle two). For the two principles, each household should be able to obtain a minimum of one room (two rooms is ideal) together with the usual services — a kitchen, a bathroom or shower, and a toilet. The services can be shared among a reasonable number of households. When these two principles were related to the prevailing minimum housing costs as much as 45.5% of the population could not be provided with accommodation.¹⁶

In order to accommodate them, a concept of percentage completeness (principle three) can be adopted.¹⁷ This requires that houses under each of the three quality standards shall be completed to a reasonable percentage to enable the householder occupy the unit, and allocation of space should be made also according to what the household can afford. Fig. 1 is a summary of these housing principles and Fig. 2 shows the relationship between house cost and space requirement and effect of percentage completeness on space requirement. It is obvious from the foregoing that both space standard (size of accommodation) and quality standard (specification for materials) are the two major factors affecting house cost. There are others, of course.

For the principles of percentage completeness to be of much benefit to the low income group particularly, I have argued¹³ that this group would have to participate in

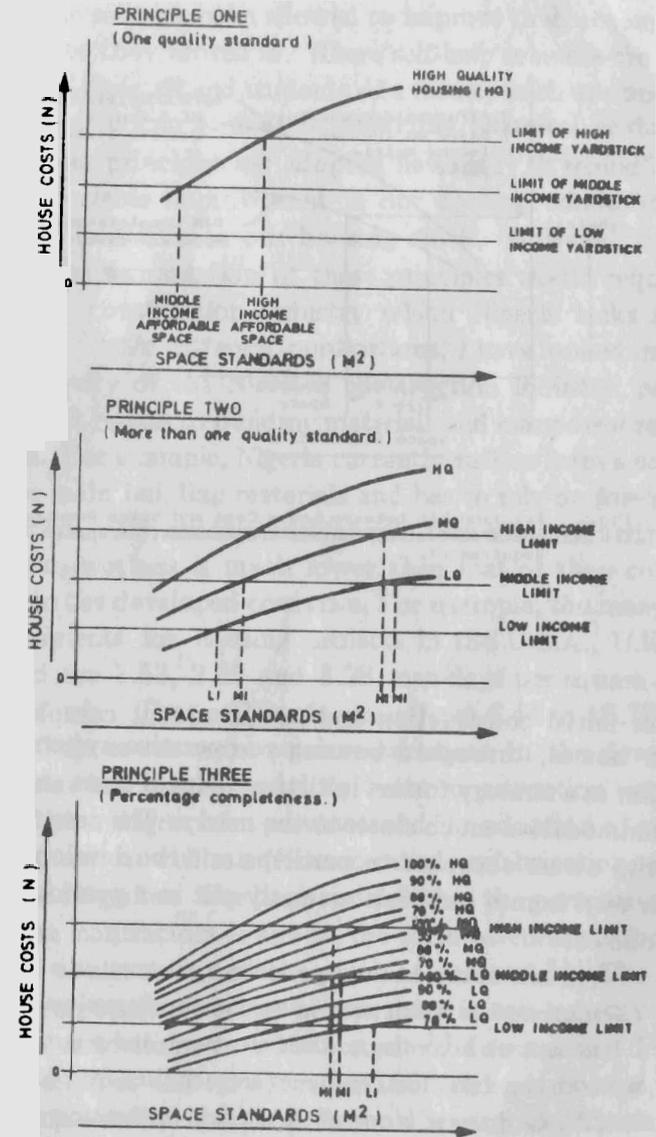


Fig. 1 SUMMARY OF HOUSING PRINCIPLES

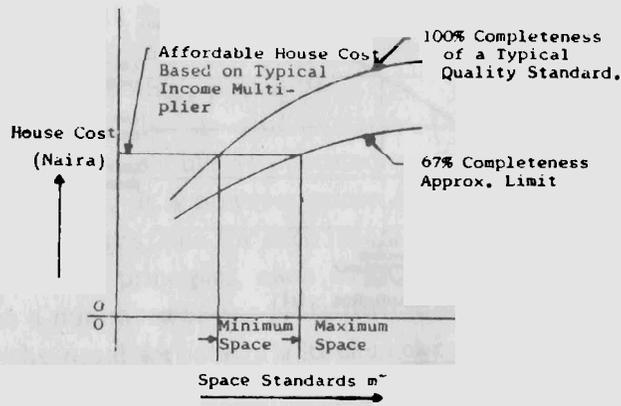


Fig.2 Relationship between House Cost and Space Requirement and Effect of Percentage Completeness on Space Requirement.

either initial construction and/or subsequent completion of their homes, through a housing co-operative system. This system as a strategy fosters initiative, reduces costs and brings accommodation much closer to the needy. The case for prospective owner-occupiers to participate in the development of their own homes has been succinctly put in a previous article as follows:

The role of the developing country's government is to create a framework in which people do things for themselves on a continuing basis according to their own needs and priorities, and in such ways that local resources are mobilized from local needs. The rural sector is one where self help (community and individual) is feasible, effective and essential.¹⁹

Happily the Lagos state government has provided accommodation that fits principle three above: occupiers of government houses have been allowed to improve their accommodation since they moved in. Where self-help schemes are implemented, the staff and students of a faculty such as ours could well have a role to play in providing technical advice.

If these principles are adopted nationally, it would lead to an appreciable improvement in our housing conditions, adding substantially to our housing stock. However, the successful implementation of these principles would require an efficient construction industry which Nigeria lacks at the moment.²⁰ In different publications, I have looked into the productivity of the Nigerian construction industry, particularly as it relates to building materials and manpower requirements. For example, Nigeria currently suffers from a scarcity of the main building materials and has to rely on foreign importation. My studies have shown that the productivity of Nigerian workers is much lower than that of their counterparts in the developed countries. For example, the manpower requirements for housing projects in the U.S.A., U.K. and Ireland are 1.53, 2.33 and 3.28 man-days per square metre respectively. That of Nigeria varies from 6.44 to 16.78 man-days. This lower manpower requirement in the developed countries can be attributed to better construction organisation, higher degree of supervision and the adoption of mechanical power as well as a fair amount of prefabrication outside the building sites. The large variability in the performance of Nigerian contractors is due to the form of construction, the size of contractors and the value of contract.²¹ The other factor responsible for low productivity in the industry is the level of education. In a 1975 study,²² I found that 19% of the operatives had no education, 36% did not possess while 38% possessed Primary VI School Leaving Certificate; and only 7% had qualifications higher than Primary VI. The

situation had improved significantly by 1981²³ as the corresponding figures were 12%, 16%, 42% and 30% respectively.

Unfortunately the housing situation in the urban areas is not likely to improve if no positive action is taken to stem migration from rural areas, where between 70% and 80% of the population still live. To achieve this it has been recommended²⁴ that the government should not only establish more industries in the rural areas, but should also provide essential amenities such as adequate housing, rural electrification, adequate water supply, hospitals and some of the facilities enjoyed in the cities.

My current research interests include the computerisation of house costs which will give opportunity for the potential home owner to complete a Multiple Input Home Ownership Form. In this form, some options for quality of materials and amenities to suit the type of house he wants are matched with his affordable house costs to generate the house plan and specification. I am also working on minimum house costs, project impact assessment and apprenticeship system in the construction industry in Nigeria.

Conscious of the acute housing problems facing Nigeria, the University of Ife established a Department of Estate Management in 1970. This department was upgraded to the Faculty status and named Faculty of Environmental Design and Management during the 1980/81 session. The main objectives of the Faculty is to produce trained professionals in the various fields of environmental design, construction and management. The following departments and units make up the Faculty:

- a. Department of Architecture
- b. Department of Building Technology
- c. Department of Estate Management
- d. Department of Quantity Surveying
- e. Department of Urban and Regional Planning

- f. Project Design Unit
- g. Pilot Production and Construction Unit
- h. Industrial Training Unit

At present, the Faculty has a teaching staff of 36 and a student population of 622. So far it had produced about 185 graduates in estate management, building technology and quantity surveying. Our first set of fully qualified architects will be produced at the end of the current session. We expect to produce our first fully qualified town planners next session.

In the development of its academic programme, the Faculty has been guided by the principle that only an integrated discipline in the physical environment can grapple with the problems and rapid development of the building and construction industry. Since the professionals produced here will have to work together for many years ahead, it is only prudent to train them together for a while so that they can appreciate one another's views and create mutual understanding in solving what are after all human problems. In our teaching, we consider the environment in its totality recognising social behaviours and human values, in addition to modern technology, as they affect the building industry. Apart from teaching, all members of staff conduct research into various aspects of environmental design and management. Our Project Design Unit is expected to conduct theoretical and applied research into housing, planning and other related fields. The Pilot Production and Construction Unit, on the other hand, will develop some of the research findings of the Project Design Unit, so that they may have more practical and wider applications. The intention here is to help develop local substitutes for imported items. The Industrial Training Unit will coordinate the Faculty's internship programmes, in addition to organising in-service training courses for the construction industry. In addition to our undergraduate courses, the Faculty has post-graduate programmes in the fields of construction management, construction economics, building structures, building maintenance management,

architectural design, real estate appraisal, as well as urban and regional planning. It is hoped that when the Faculty is fully developed, it would add a new dimension to the solution of housing problems in Nigeria.

IV

In conclusion, there is no doubt that Nigeria needs a better housing programme than it has at the moment. As has been pointed out, the main forces militating against such a programme are, among others: (1) an extended family system which encourages over-crowding and insanitary conditions; (2) unprecedented urban migration which causes serious congestion in the cities; (3) incompetent and corrupt building contractors; (4) shortage of well trained building professionals; (5) short-sighted and extravagant housing policies resulting in such types of accommodation that majority of our people cannot afford; (6) high cost of building materials; (7) adoption of foreign and inappropriate technology.

To combat the problem of overcrowding, most especially in the city, the government should enact a law specifying the maximum number of people who can occupy or sleep in a given dimension of residential space. To check the mass drift from rural to urban areas, more industries and essential social amenities such as schools, rural electrification, good roads, hospitals should be established in the rural areas. Satellite towns should be created to ease off the burden on big cities. To reduce incompetent and corrupt professional builders and contractors to a minimum, the federal government should enact a law to establish the Professional Builders Registration Council of Nigeria to ensure high standard of practice and moral conduct in the building industry. To combat the shortage of well-trained building professionals, the government should invest more in the training of professional builders, architects, town planners and quantity surveyors, etc. at the top and the middle management levels. Existing schools or faculties of environmental design and

management should be expanded and new ones created. The need to entrust major projects to indigenous builders cannot be overemphasized because of the implications for our national security and survival. The invasion of the Entebbe Airport in Uganda would possibly not have been easily accomplished if the airport had been designed and built by indigenous experts. Besides, and as the Kainji Resettlement Scheme has shown, indiscriminate involvement of "foreign experts" who are ignorant of the social, cultural and geographical conditions of the country can do more harm than good to our national development. Only knowledgeable and dedicated foreigners should be employed, and only in the area of manpower training and development. There is now an urgent need to harness the expertise of building professionals in our universities for purposeful consultancy services at the state and national levels. This will not only enable the nation to save a considerable amount of foreign exchange currently expended on foreigners, but will also stem the exodus of academics into more lucrative private practice.

Most of the existing government policies on building and housing need to be reviewed and streamlined. The government should stop deceiving itself that it can provide adequate housing for all; the fund is simply not available, given the numerous other essential facilities which the government has to provide on a large scale. As already mentioned, the use of over-generous space and quality standard, coupled with the corruption accompanying the award of government housing contracts and the use of too many professional advisers, often lead to considerable waste. Hence government building projects are more often than not the most expensive in the country. In my view, the federal and state governments should not involve themselves in direct construction of mass housing. The local government authority is, I think, in a better position to tackle housing problems, since it is the closest to the people and understands their social and cultural needs. Of course, this is not to say that local government

officials are angels! The point being made is that the large-scale corruption involved in huge housing projects would not only be minimised in smaller ones, but also that local government officials would be better placed to monitor the performance of contractors. The contribution of federal and state governments should be channelled largely through the establishment of more factories locally to produce conventional building materials such as louvre frames, door and window frames, flush doors and standard roof trusses, to be sold at subsidised prices.

To check inflation, the government should introduce the use of coupons for buying these materials from recognised builders, merchants or special depots to be established in both urban and rural areas. The government should also encourage research into the development of new and cheaper materials such as laterite blocks and bricks to reduce the current over-dependence on cement. In addition government can encourage the formation of housing co-operatives which would involve prospective owner-occupier in the initial construction and subsequent completion of his house.

While it is desirable that the government should encourage building entrepreneurs to go into speculative housing, some form of rent control should be imposed. To ensure compliance, all rents should be paid directly to the government treasury or a rent control office which will then credit the accounts of respective landlords. Through this procedure, it is hoped that the number of shylock landlords would be reduced. The government should also reactivate the Housing Felicity Council which will ensure that all employers of labour provide decent housing for their workers.

May I seize this opportunity to call on the federal government to avoid at Abuja, our new capital, some of the errors committed by the countries who have had to build a new capital from scratch. We should be modest in the standards adopted for the buildings there. We should allow the city to develop gradually; we should not set too short a time to

complete the movement to Abuja, even if the funds were to be available, so that we do not disturb the ecological balance which nature has provided for the area. The major sectors of Abuja should be so planned as to avoid the creation of a ghost city after working hours. We should pay more attention to the fulfilment of essential functional requirements. If we must adopt the skyscrapers which are in vogue, we should take fire regulation more seriously. It is shocking to learn that notwithstanding the existence of several tall buildings in our cities, the fire fighting capability of the Federal Fire Department is limited to a ten storey building. Hence it took several hours and the timely assistance of a British fire fighting force just returning from the Falkland Islands to put out our recent fire outbreak in the NET building. High rise residential buildings that give many of their occupants acute uneasiness, and mothers with young children insoluble problems of play and supervision should be avoided. Let us hope and pray that Abuja will avoid many of our past mistakes.

By and large — and as would have been obvious by now — building is one of man's most precious possessions. Not only does it offer him both physical and psychological protection, it is a symbol of his conquest of the earth — a monument to his power and glory. The very word "building" summarizes the process and substance by which the earth has been transformed from the primordial jungle into what it is today, a living and evergrowing testimony of man's relentless quest to make the earth a more comfortable place to live in.

In this university, we have succeeded in transforming the jungle into a space which is the envy of all visitors. Our struggle for a better place to live in with security, comfort, and access to essential amenities must continue on an even keel, in the hope and expectation of meeting our future needs. We cannot and should not settle for less, since housing is more than shelter and building activities are more than the development of housing.

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