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Spatial Distribution of Residential Housing Types in a Developing City of Nigeria

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ABSTRACT - The aim of this study is to analyse the different housing types with a view to unraveling the relationship existing between housing types and the concentric planning zones of Uyo, Capital City of Akwa Ibom State, Nigeria. Methodology employed questionnaire, interview and observation techniques. The city was divided into 3 concentric zones, based on the concentric zone theory. Using random sampling technique, 40 houses were selected in each zone. Eventually, a total of 105 questionnaires were retrieved and used in the analysis. Chi-square distribution (X^2) technique of data analysis was used to test the relationship of the distribution of housing types and the city zones. The probability level of 0.05 was selected. The results confirm an existing relationship between housing types and the different zones of the city. The study has also confirmed that residential land-use is also found in some prime position such as in the inner zone of the city. At first, this may seem to present some contradictions to the 'Urban Rent Theory'. But in fact, it can be partially explained

by the varying intensity of space use among various residential housing.

Kew words: Housing types, distribution, residential, Uyo, Nigeria.

INTRODUCTION

The study of the spatial character of urban land-uses has in many cases been deliberately neglected under the wishful premise that the placement of things within cities is chaotic, random or simply the result of a series of peculiar historical events. This is the usual stance of the popular writers on the city, many of whom argue that studying the placement of activities within a city is like trying to find order in a garbage can (Boyce, 1978). This is a fallacy, because even a cursory glance reveals similarities among cities, and further investigations demonstrated that their structural movements complex and apparently irregular as they are respond to definite principles (Hurd, 1974).

It is on this background and the fact that residential housing forms a significant part of the land-use pattern of Uyo, that this study was undertaken. The aim of the study is to analyse the different housing types in the city with the view to unraveling the relationships existing among the distribution of housing types and the inner zone, middle zone and the outer zone of the city. It was hypothesized that there was no relationship between housing types and the city zones.

THE STUDY AREA

The study was conducted in Uyo. Uyo is the capital city of Akwa Ibom State in Nigeria (see fig.1). It extends between latitude 7°49" to 8°03 East and between longitude 4°52" to 5°07" North and covers an area of about 985.96 square kilometers. By 1991, the population of the city was 118,250 (NPC, 1992). According to Akpan and Daniel (2007), Uyo came into existence in 1905 as an administrative center, when Mr Brooks, Captain of then British army unit conquered the area and made it the headquarters of Uyo District. Between 1960 and 1967, Uyo served as province headquarters. From 1967 – 1976, it served as Divisional headquarters. In 1976, it became a local government headquarters. From 1987, it became a state capital with the creation of Akwa Ibom State as well as serving as a local government headquarters, status it maintains to date.

CONCEPT OF INTRA-URBAN LOCATION

Boyce (1978) attempted to provide a basis of understanding the placement of people and functions within cities. Attention was given not only to how the land within cities is used, but also to why it is so used. He demonstrated that the land-

use patterns of cities were spatially ordered. These patterns can be understood by using concepts and theories of intra-urban location. According to Boyce, such principles possibly provide more powerful location explanations for intra-urban activities. He said that intra-urban spatial study also includes understanding urban problems like decline of the central business districts, decentralization, and sprawl. Boyce sees the solutions to these problems and improvements in the quality of the urban environment as stemming from the solid base of intra-urban spatial appreciation and understanding.

Despite the potential for intra-urban spatial understanding some writers in the past argued that studying the placement of activities within a city was like trying to find order in a garbage can. For example, a well-known planner-architect was quoted by Jacob (1963) as saying 'Cities are nothing but a chaotic accident, the summation of the haphazard, antagonistic whims of many self-centered, ill-advised individuals.' This assertion is the exact opposite of that expressed by urban land economist Richard Hurd (1974) 'If cities grew at random the problem of creation, distribution and shifting land value would be insoluble.'

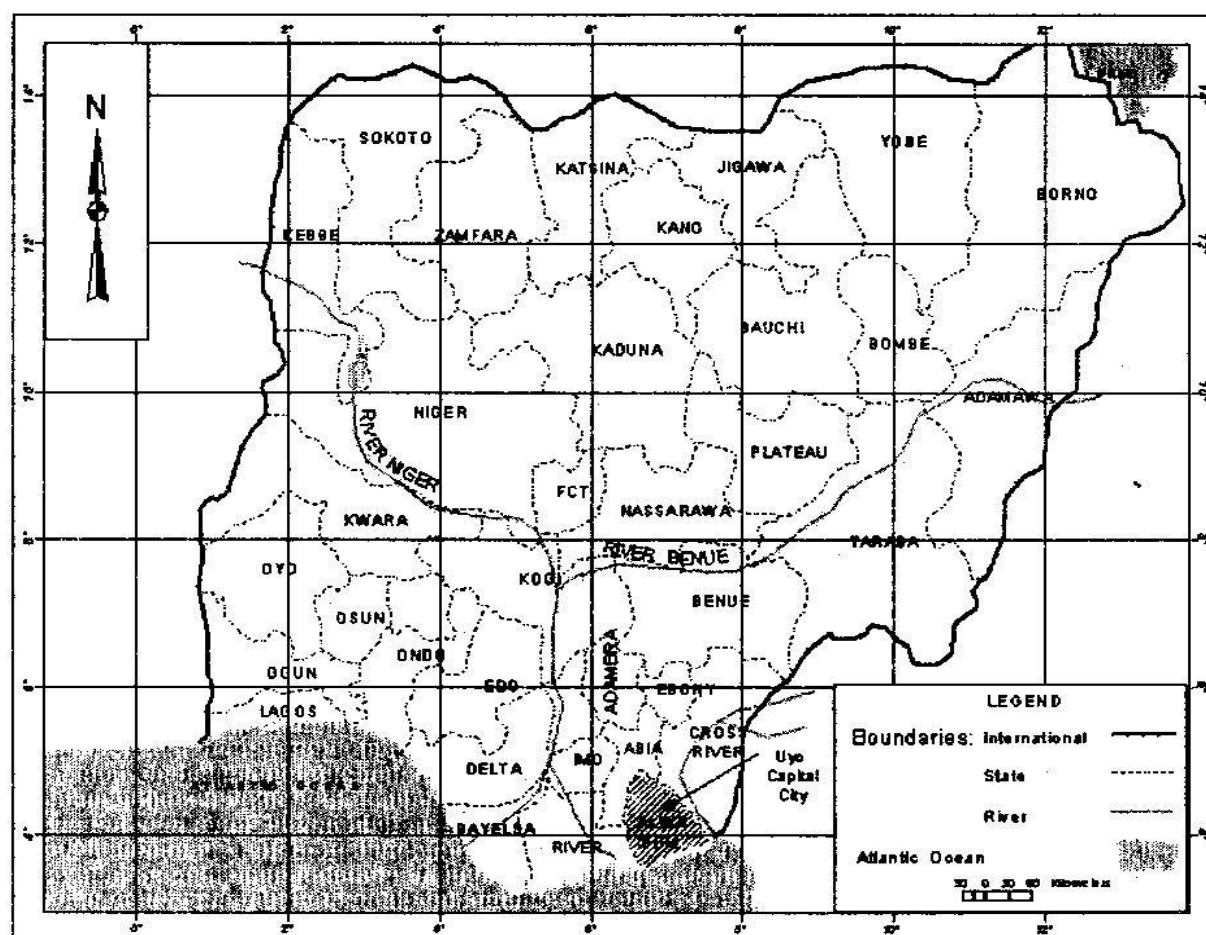


Fig 1: Nigeria showing Akwa Ibom State and Uyo the Capital City

Still others argue that city land-use patterns are so orderly as to be almost foreordained. Such a simplistic approach to urban land use is illustrated by the too common assertion that the city is an organism. The architect Eliel Saarinen expressed this philosophy by stating "as long as . . . the expressive and correlative faculties are potent enough to maintain organic order there is life and progress of life. Again, as soon as this ceases to be the case and the expressive and correlative faculties are impotent to prevent disintegration of organic order, decline and death occurs. This is true, no matter whether it happens in the microscopic cell tissues of cell-structure where cancer, causes disintegration or in the hearts of our large cities of today where compactness and confusion cause germs to spread." (Saarinen, 1943).

Thus, almost every part of the city is presumed to be analogous to some part of the human anatomy; the central business district becomes the heart; the parks lungs, telephone wires becomes the nervous system, and depots and warehouses become the mouth through which the city is fed. Even residences become cells and various other parts of the city are given physiological counterparts (Boyce, 1978:299). Hartshorne (1981) in his study titled "Inner City Residential Structure of American Cities", reported that multiple family units dominated the inner zone, double-family units then appeared, and single-family residences predominate in the outer zone.

Theoretically, each urban function is in competition with all others for the most accessible, that is, the best sites. Functions that can pay the highest price (rents) will be able to obtain the choicest sites. This explanation is based on the differential ability of various urban activities to bid for land because of diminishing utility of various sites with increasing distance from the urban center. The operational process is highly analogous to the Von Thunen Agricultural Rent Models.

Among the major categories of Urban land-use commercial activities are the highest bidder for sites. Thus, they usually occupy the most accessible site within a city. Residential land uses are more prominent in the outer parts of a city but are also represented in the inner and middle parts (Boyce, 1978:310). While some users of residential land, such as millionaires, may be able to outbid commercial functions for land, these seem to be of little inclination to do so. Hence, the rule in most cities is for the high-income population to occupy outlying sites and for low-income population to occupy sites fairly close in.

One reason the poor can occupy inner-city sites is that the value and the rent-paying ability of the land can be enhanced through the building of the single roomy or wagon type of houses whereby space is occupied more intensively. For example, a house of 10 single rooms may yield several times as much rent as a three-bed room flat apartment on the same sites. In this way some residential sites when used intensively, as in the case of single roomy apartment may actually outbid

a flat office use for that property. Thus the type of housing upon a site is a function of its accessibility potential.

HOUSING CONCEPT

Housing in this study is considered as dwelling structure that meets the following two main requirements: Shelter from the elements and from intruders; Security from the dangers of fire and building collapse (Murison, 1974:4).

There are many basis of classifying residential housing type. For example, housing may be classified by standard: conventional housing and non-conventional; by age: ancient, and modern. Housing could also be classified on the basis of quality and facilities with respect to material and function. However, in this paper, classification was on the basis of site intensity usage. Thus the following housing types were identified:

(a) SINGLE ROOM APARTMENT:

A single room apartment is the type that a single room is designed to accommodate only one family. Houses of this type may contain several rooms on a small site (Fig. 2.0). Many of these houses lack basic facilities such as human waste disposal system, playground and parking space. Low income, unskilled workers and students patronize this housing type in Uyo. Its frequency was found high in the inner city.

(b) DETACHED SINGLE FAMILY HOUSING:

This is single family dwelling housing unit, which could be one bedroom or multi-bed room (Fig. 2.1). It does not share its roof with any other dwelling unit. As the name implies it accommodates only one family. Basic in this housing type are the sitting room, built-in kitchen, built-in water cistern toilet and parking space. Relatively high-income earners, specialized workers in the private and public sector dominate in this type of housing. The detached single-family housing is more frequent in the outer zone of the city.

(c) NON-DETACHED TWO/MULTI-FAMILY HOUSING:

This is the type where two or more family dwelling units are built within one roof and was found to be predominant in the middle zone of the city (Fig. 2.2).

(d) HIGH-RISE HOUSING:

High-rise storey building carries one or more floors above the ground level. This housing type was later dropped in the analysis, because a very negligible number came into the sample.

METHODOLOGY

The study was conducted in Uyo, capital city of Akwa Ibom State in Nigeria. The city was divided into three concentric zones based on the concentric zone theory, elaborated by Burgess (1925). They are: (i) Inner zone which covers a radius of about 2 kilometers with "Ibom Connection" at the center. (ii) Middle zone covering a distance of approximately 2 kilometers from the boundary of the inner city. (iii) Outer zone which lies outside the middle zone (see fig. 3).

PROCEDURE USED FOR THE SAMPLING

In order to ensure effective coverage of the study area, a total of 120 questionnaires were distributed, 40 in each of the 3 zones, using random selection technique. The random selection technique involved, superimposing grids on a map of Uyo city. A table of random numbers was used to select the grids for sampling. Identification of grids on ground was done using proximity to roads as landmarks. Eventually, a total of 105 questionnaires were retrieved, thirty-three from zone 1, forty from zone 2 and thirty-two from zone 3.

METHOD OF ANALYSIS

Chi-square distribution (χ^2) technique of data analysis was used to test the relationship of the distribution of housing types and the city zones at probability level of 0.05. The choice of chi-square analysis technique is basically because the samples obtained from the field respecting different types of housing in the 3 demarcated zones of Uyo city were generally small (less than 30). In which case the standard deviation becomes lower than that of the population and cannot be use to compute the standard error. Therefore, to establish whether or not there was a dependency relationship between housing types and the city zones, the chi-square test (χ^2) was the most useful option.

RESULTS

Zone 1: The inner city has a radius of 1,000 meters with 'Ibom Connection' at the center. The summary of housing types in this zone is presented in Table 1.

Table 1: Types of Housing Sampled in Zone 1 (Inner Zone)

House Type	Nos.	%
Detached	8	24%
Non-Detached	0	0%
Single Room	25	76%
Total	33	100%

Source: Author's Field Survey (2006)

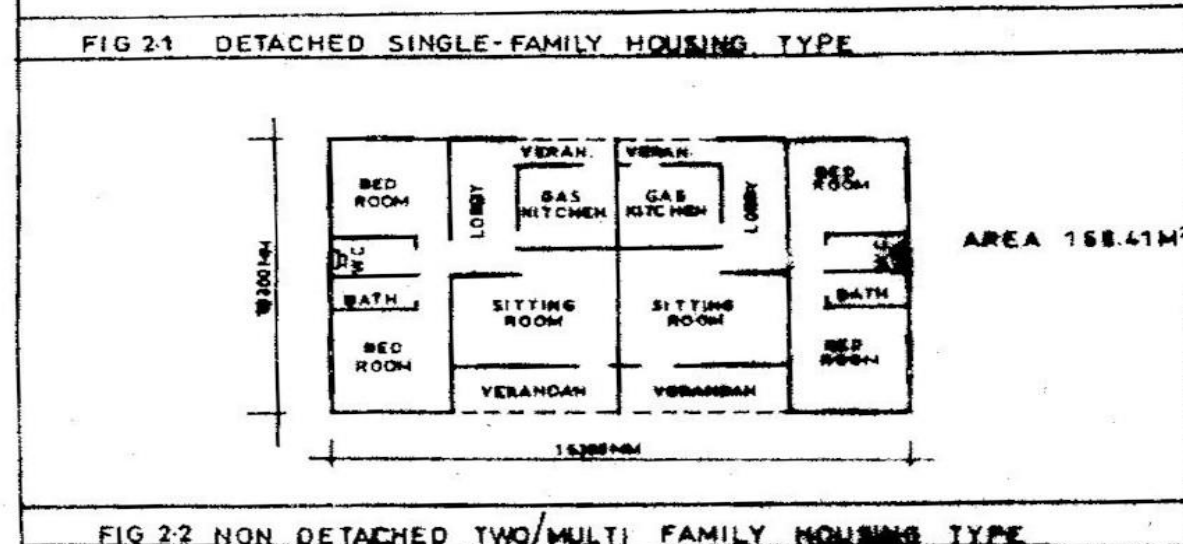
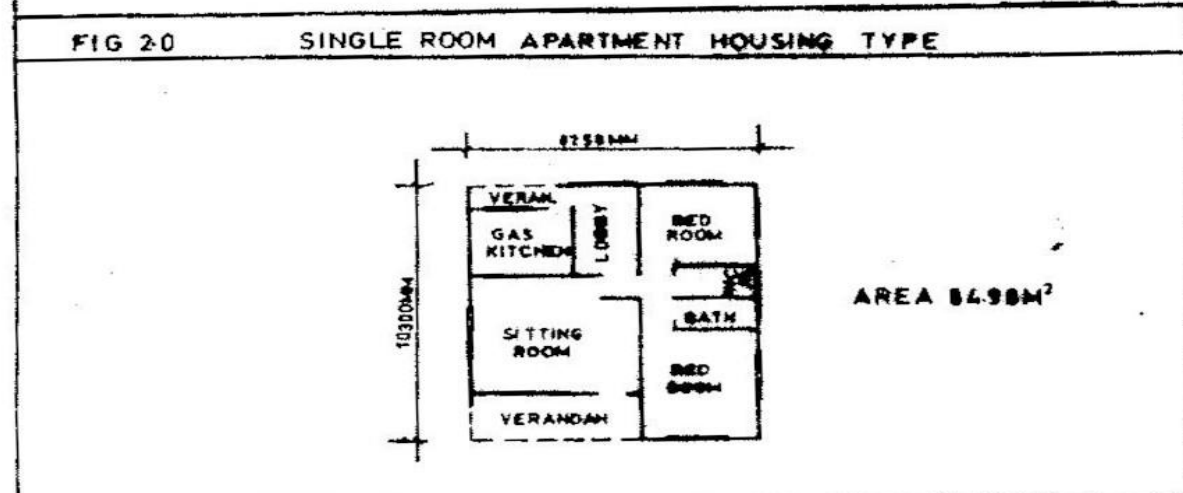
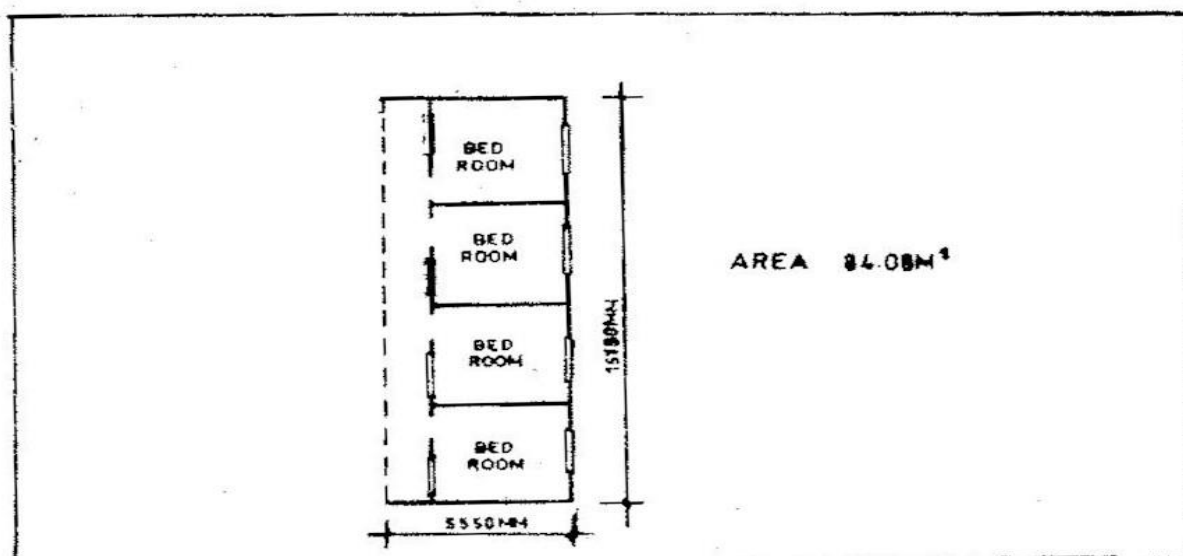


Table 1 shows that out of 33 houses randomly sampled, 8 houses, representing 24% of the total were detached type while 76% were single room apartments. There were no non-detached houses in the sample set. This however, does not mean that there are no non-detached houses in this zone; its frequency of occurrence compared to other types is negligible. Single Room apartment is therefore the most dominant in this zone.

Table 2: Types of Housing Sampled in Zone 2 (Middle Zone)

House Type	Nos.	%
Detached	0	0%
Non-Detached	30	75%
Single Room	10	25%
Total	40	100%

Source: Author's Field Survey (2006)

Zone 2: The Middle Zone; This area extends 1,000 meters from the boundary of the inner zone. From table 2, non-detached house type forms the dominant housing type in Zone 2 with 75% while single room type forms 25%. Coincidentally, detached housing has zero percent occurrence in the sample set. This however does not mean non-existence in the zone, but rare occurrence in the area.

Table 3: Types of Housing Sampled in Zone 3 (Outer Zone)

House Type	Nos.	%
Detached	24	75%
Non-Detached	0	0%
Single Room	8	25%
Total	32	100%

Source: Author's Field Survey (2006)

Zone 3: The Outer Zone; This is the remaining area after the inner zone and the middle zone. It is interesting to note that detached housing type which had zero percentage of occurrence in zone 2 now becomes predominant in zone 3 with a percentage of 75%, while non-detached that had a high percentage of 75% in zone 2 now reflects a zero percentage of occurrence in the sample set.

TESTING OF HYPOTHESIS

The hypothesis stated earlier that there is no relationship between housing type and city zones was tested using X^2 test as shown in Table 4, 5 and 6.

Table 4: Contingency Table

Housing Types	Zone 1	Zone 2	Zone 3	Total
Single Room	25	10	8	43
Detached	8	0	24	32
Non-Detached	0	30	0	55
Total	33	40	32	105

Source: Derived from field data (2006)

X^2 formula is as follows: $X^2 = \sum \frac{(O-E)^2}{E}$

Where: O = The observed value of distribution

E = The expected value of distribution

Table 5: Calculation of the Expected Value of Distribution

Zone 1/ single room $\frac{33 \times 43}{105} = 13.51$	Zone 2/ single room $\frac{40 \times 43}{105} = 16.38$	Zone 3/ single room $\frac{32 \times 43}{105} = 13.10$
Zone 1/ detached $\frac{33 \times 32}{105} = 10.06$	Zone 2/ detached $\frac{40 \times 32}{105} = 12.20$	Zone 3/ detached $\frac{32 \times 32}{105} = 9.75$
Zone 1/ non-detached $\frac{33 \times 55}{105} = 17.30$	Zone 2/ non-detached $\frac{40 \times 55}{105} = 20.95$	Zone 3/ non-detached $\frac{32 \times 55}{105} = 16.76$

Source: Derive from Table 4

Therefore $X^2 = \sum \frac{(O-E)^2}{E}$ is as shown in Table 6

Table 6: Calculation of X^2

$\frac{(25 - 13.51)^2}{13.51} = 9.77$	$\frac{(10 - 16.38)^2}{16.38} = 2.49$	$\frac{(8 - 13.10)^2}{13.10} = 1.99$
$\frac{(8 - 10.06)^2}{10.06} = 0.42$	$\frac{(0 - 12.20)^2}{12.20} = 12.20$	$\frac{(24 - 9.75)^2}{9.75} = 20.83$
$\frac{(0 - 17.3)^2}{17.3} = 17.3$	$\frac{(30 - 20.95)^2}{20.95} = 3.91$	$\frac{(0 - 16.76)^2}{16.76} = 16.76$

Source: Derive from Table 5

Therefore $X^2 = 9.77 + 2.49 + 1.99 + 0.42 + 12.20 + 20.83 + 17.3 + 3.91 + 16.76 = 85.67$. The calculated value of $X^2 = 85.67$, Degree of freedom (D/F) = 4. Entering the table of X^2 distribution at $V = 4$ under 0.05 probability level, the table value = 9.488.

Since the calculated value of 85.67 is greater than the table value of 9.488, the hypothesis that there is no relationship between housing type and city zones was rejected at 0.05. An alternate hypothesis that there is significant relationship between housing type and city zones was generated and accepted. Hence there is a relationship between housing type and the city zones.

SUMMARY

The study confirms an existing relationship between housing type and the different zones of the city – inner zone, middle zone and the outer zone. Single room apartment housing type was found to occupy a significant percentage of the residential land-use pattern of the inner city. This is justified by high cost of land in this zone, thereby limiting individual land holdings to small pieces. Therefore to maximize profit, many owners embark on construction of single room apartments. This is more viable in terms of rent value than detached single family and non-detached two/multi-family housing types because a single room presently attracts not less than N1,500 per month, amounting to N6,000 for the four rooms compared to one bedroom detached single-family housing type which attracts about N3,000 per month. Moreover, non-detached two/multi-family housing type has additional space consumption requirement for the provision of sanitary septic tanks and soak pits.

Interestingly, non-detached two/multi-family housing type was found to occupy a significant percentage of residential land use in zone 2. Many of the houses in this zone were built within the last two decades since the inner city was already a built-up area. Development in the past decades was concentrated in zone 2 where vacant plots are still available. Although they are very expensive and of small holdings, yet it has become attractive residential area for the middle/high income because of lower noise pollution level, flood problem and density than in zone 1.

The detached single-family housing type was found to be dominant in the outer zone of the city. Actually this area has overlapped into some hitherto rural communities such as Afaha Oku, Atan Offot, Anua Offot, Itiam Etoi, Afaha Ube, etc. Hence, plots are available in large expanses thus providing rich property developers opportunity to acquire plots that can take more than one single family dwelling unit on a site. Consequently, owner-occupant houses are many in this zone. Also, availability of space allows for servant's quarter apartment as separate from the main building. In many cases servant's quarter apartments are designed

to accommodate a small size single family, thus enhancing their identity as detached single family housing types.

CONCLUSION

Based on Urban Rent Theory, it might appear that residential spatial patterns are relatively easy to understand. Residential land use is squeezed outward to the least accessible sites, thus the land use dominant on the edge of cities and at other less accessible places within the city.

Nonetheless, this study has confirmed that residential land is also found in some prime positions such as in the inner portions of the city. At first this may seem to present some contradiction to the Urban Rent Theory, but in fact it can be partially explained by the varying intensity of space use among various residential housing ranging from detached two-multi-family dwellings to single room dwelling apartments.

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