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LOCATION AND NEIGHBOURHOOD-EFFECTS ON URBAN HOUSING VALUES: CASE STUDY OF METROPOLITAN LAGOS

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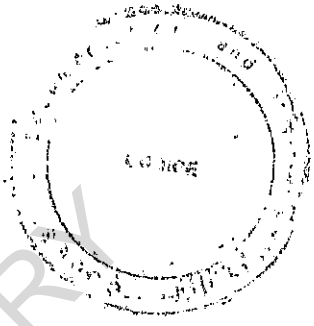

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ABSRACT

Empirical studies of housing values are inconclusive on the impact of neighbourhood variables on the household's residential choice because they assume that the effect of structural characteristics of housing on property values is fixed, i.e., invariant across neighbourhoods. The contribution of structural housing attributes in housing price determination fails to take into account the geographical realities operating at neighbourhood levels. In addition, the issue of spatial scale for delineation of urban housing submarkets and for the consideration of neighbourhood variables have not been adequately treated in previous studies. Therefore, this study examines the different housing prices produced by housing attributes at different locations and their influence on the spatial variations in the demand for neighbourhood attributes.

The aim of this research is to determine and analyse relative roles of location, spatial scale and the physical characteristics of houses in the determination of housing values. In order to achieve this, the study: (i) shows how house prices vary by area and the role of changing spatial scale in the understanding of housing values; (ii) evaluates the effects of physical properties and the role of neighbourhood attributes in the determination of house prices

in different areas of the city; (iii) shows how changing spatial scale of housing attributes leads to identification of housing submarkets in metropolitan Lagos and; (iv) determines the extent to which these findings help in the understanding of the structure of housing market in Nigerian cities.

The four hypotheses tested in this study were designed to know both the degree of absolute price effects of houses on each other and the differentiated contributions of various housing attributes in different neighbourhoods and submarkets. They are: (1) There are variations in the prices of houses by location and by neighbourhoods; (2) Households having high socio-economic characteristics occupy highly valued housing units; (3) The measurement of housing values through varying spatial scales of investigation within the cities yields different results for the analysis of housing submarkets; (4) The variation in house prices for different submarkets may be explained by differences in structural / physical characteristics of houses, neighbourhood attributes and, location in space.

The conceptual framework focuses on housing at both micro and macro levels. The micro is the household, while the macro is spatial and relates to areas within the city. There are therefore two sets of theories: urban micro-economic and macro-economic theories that provide conceptual issues for the

study. The first include the trade-off models and their more recent reformulations, the hedonic model and the expansion method; while the second involves the urban spatial structure and the ecological approach to urban land values.

The study is based on data collected from ten Local Government Areas consisting of 53 residential zones in metropolitan Lagos. Out of the total number of 135,820 properties, a size of about 1% (1,410) was randomly selected. The choice of the study area, Metropolitan Lagos, is based on many factors. First, the housing markets are very well developed in Lagos. Consequently, it is possible to identify and analyse variations. Secondly, comprehensive data is available on property values in the state. The data are expected to be useful in the explanation of the variations of housing attributes over space.

The results of the examination of spatial variations of neighbourhood and locational attributes on house prices showed that there are significant variations in all the explanatory variables. For instance, the annual income of the household head is noted to be the most significant predictor of the house values and there is a strong association between income and house values. Other important variables are type of people living in the area, area of land occupied, number of rooms occupied, number of persons in the households, type of buiding

occupied, location of workplace and transportation cost. The analysis proved the important role of neighbourhoods in house rental charges. The spatial variations of neighbourhood and locational explanatory attributes confirm the first hypothesis that there are variations in the prices of houses by locations and neighbourhoods. The significant variations in almost all the variables in the different neighbourhoods were attributed to the various locational differences which exist in the housing structures.

The study showed that the use of small geographical areas helped to identify similar zones and neighbourhoods that have the same housing values and similar socio-economic characteristics. This is unlike some of the previous studies that combined wider areas together and so failed to identify spatial submarkets. In order to achieve this, the study utilized four different geographical scales to evaluate and identify the level at which studies of variations of house values become meaningful. It showed that the highest level of disaggregative data occur where cities are divided into small, near homogeneous areas or zones. These variations in house values by zones become more distinct than house values for communities and local governments that bear the same name. The results validate the hypothesis that the spatial scale of areas of investigation within the cities affects the

measurement of housing values.

The grouping of the zones with similar house values also help to identify housing submarkets that exist in the study area. The submarkets have variations in housing values that conform with the socio-economic characteristics of the households. Some areas have very high values while others have very low values. This confirms the hypothesis that households having high socio-economic characteristics occupy highly valued housing units while those with low characteristics occupy housing units with low values. The analysis revealed that spatial variation of metropolitan Lagos could be described in terms of 3 major dimensions of neighbourhood/ structural attributes, socio-economic variables and the infrastructural facilities.

Furthermore, there is an improvement in the explanation of the existence and measurement of housing submarkets. Arimah's (1990) definition and delineation of housing submarkets in terms of neighbourhoods that radiate from the city centre to urban peripheries was corrected. Thus, the study groups distinct spatial units to constitute income sub-groups. Variation over space were then identified in the various submarkets. The determinant of house values in each of the different submarkets revealed that income and number of rooms occupied by households are the most important variables.

The variations of values over different segmentations of the urban housing market showed the contributions of housing attributes. The values showed that each submarket has different price structure of housing attributes in it. The four identified submarkets have different house values with different socio-economic backgrounds. The variation of the importance of housing attributes over the submarkets confirms the fourth hypothesis that different attributes of housing values are required in different housing submarkets to explain the pattern of housing.

The results of our analysis and evaluation of relative contributions of housing attributes to house prices through the expansion method showed the proportion of a unit increase in the variables over house prices. A unit increase in the level of income of the households brought an upward increase in house values. Also, the higher the income the more the number of rooms the households may likely want to occupy (if the number of rooms they are presently occupying is not enough). Furthermore, the relative contributions of area of land on house values is high. Thus, while the variables used showed their relative effects on housing values, the expansion method demonstrated its superior usefulness by showing the relative effects of the variables in addition to their specific contributions to the explanation of housing values.

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Finally, I am most grateful to the Almighty God who through all the years took his yoke upon me and made me to endure to the end.

OLA ALUKO

CERTIFICATION

I certify that this work was carried out by Mr. Olanipekun Emmanuel ALUKO in the Department of Geography, University of Ibadan.

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Signed :-
Professor & Head of Department
Department of Geography
University of Ibadan
Date..... 19.....

DEDICATION

This Thesis is dedicated to the Glory of the Almighty God. For "God with me" is Christ in me, the hope of glory.

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CHAPTER ONE

BACKGROUND, AIM AND OBJECTIVES OF STUDY

1.1 STATEMENT OF THE RESEARCH PROBLEM

Housing, to urban residents, is a package of services which involves not only shelter but also of the consumption of services. It entails access to everyday life-sustaining activities and centres as jobs, markets and shopping centres. It also entails proximity to like minded neighbours. The availability of these requirements in a place confers some measures of value on the area, thus enhancing the status ascribed to it.

The emphasis on the urban nature of the housing markets is dictated by the simple assertion that housing in Nigeria is an urban problem as increasing numbers of households now live in urban areas. In 1921, the proportion of the total population of Nigerians living in cities with 20,000 or more population was estimated at 4.8 percent. It was 6.7 percent for 1931. This had risen to 10.2 per cent by 1952/53 census, and to 19.2 percent by 1963. The 1991 census shows that 32 percent of the people lived in urban areas. The housing market in an urban area consists of various submarkets which are related to one another in varying degrees. Hence, housing markets are largely defined within urban areas for the purpose of addressing many spatially related aspects of it that are

most salient within urban areas.

The impact of location on housing market is very significant. Since housing units are fixed in location, they differ in terms of their surroundings, the kind of community in which they are located, and their nearness to employment and shopping places. It also means that a dwelling's surrounding is possibly of great importance in affecting its value. This research will therefore among others examine how location determines or influences house prices and the preferences of the people.

There is a lack of consensus in existing literature as to the exact meaning or definition of housing (Salau, 1990). According to Marshall (1950), the term housing is a bundle of many different attributes purchased together. These attributes may contribute to the satisfaction of a variety of different wants, among which are shelter, convenience and social distinction. Bourne (1981) puts housing as all at once a physical entity, a social artifact, an economic good, a capital stock, status symbol, and at times, a political 'hot potato'. The World Health Organization (WHO) defines housing as "residential environment which includes, in addition to the physical structure that man uses for shelter, all necessary services, facilities, equipment and devices needed or desired for the physical and mental health and social well-being of

the family and individual" (Onibokun,1990). The most important thing in the definitions is that the conception of housing must transcend its physical dimension.

Neighbourhood on the other hand is important due to its variation over space or its linkages to housing purchase. For the importance of housing purchase with neighbourhood or with location relative to workplace (distance), for example, is an urban problem and this has major urban spatial implications. Since there is considerable variability in real world dwelling units and since there are limited numbers of both dwelling units and neighbourhoods, the spatial linkage may involve some constraint on the otherwise unrestricted tastes for either structural or neighbourhood components. Moreover, once settled in a given location, one is subject to the externalities that neighbourhood effects impose.

While the literature measuring externality from occupants has been burgeoning (Anderson and Crocker,1971; Nelson,1978; Li and Brown,1980), little has been said on housing about the extent of neighbourhood effect, measured in price or distance, of non-conforming structures uses, such as commercial or industrial buildings. The paucity of evidence on this is surprising because the presumed presence of this externality has often been used as one of the pretexts for zoning regulations (Segal, 1979). Furthermore, existing studies are

inconclusive on the extent of externality and there has been little effort to integrate neighbourhood externality into models of urban spatial structure (Can,1991). This study will incorporate these considerations into models of urban structure to provide an explicit geographical perspective.

Most urban analysts also agree that neighbourhood quality is an important element of the housing bundle. However, there is little agreement regarding the measurement of neighbourhood quality (Dubin and Sung, 1990). The choice of neighbourhood quality is based primarily upon data availability and hence little justification is given for the choice of variables. Perhaps because neighbourhood is difficult to measure, and more difficult to model, housing researchers have often asserted that it does not make much difference. If such is the case, then the observed ethnic and racial enclaves that obviously exist have no economic meaning (Goodman,1989). This ascertion then implies that realtors, home buyers, and the general public are misguided or misinformed in their statements to pay premium for at least some neighbourhood amenities. It is thus necessary to examine both the modelling and the empirical concerns of neighbourhood as part of the housing purchase, that is, give more attention to neighbourhood characteristics as determinants of housing prices .

Furthermore, the typical inhabitant of a large society lives in a differentiated part of an extensive urban complex. The local community is, for him, a more or less differentiated neighbourhood with whatever place, names and unique characteristics that obtain there. The fact that there is a spatial disparity in the distribution and quality of public services and infrastructural facility means there is great variation, by sub-area, within a metropolis. This research is therefore meant to know both the degree of absolute price effects of houses on each other and the differentiated contribution of various housing attributes in different neighbourhoods.

There is a great deal of diversity among neighbourhood structures within metropolitan areas. This in turn, has a significant impact on the valuation of structural attributes of houses by consumers (Can, p.255 1991). This implies that a household normally considers the quality of its potential neighbourhood such as its location and the public services provided to that neighbourhood, in taking a decision about the housing unit it will reside in. For many people would prefer to live in neighbourhoods where the returns on their housing investment will be highest. Also, for the same reason, people are willing to invest in maintaining dwellings where the returns on such expenditures will be sufficiently high. In

other words, households pay more attention to neighbourhood characteristics as determinants of housing prices. But, existing empirical studies of housing demand and supply are inconclusive on the influence of the neighbourhood variables on the household's residential choice (Williams, 1979; Goodman,p.50 1989; Dubin and Sung,p.98 1990; Can,p.254 1991). The results are inconclusive because the studies assume that the effect of structural characteristics of housing on property values is fixed, that is, invariant across neighbourhoods. The contribution of structural housing attributes to housing prices fails to take into account the geographical realities operation at neighbourhood levels in housing price determination. Therefore, this study will examine the different housing prices produced by housing attributes at different locations and their influence on the spatial variations in the demand for neighbourhood attributes.

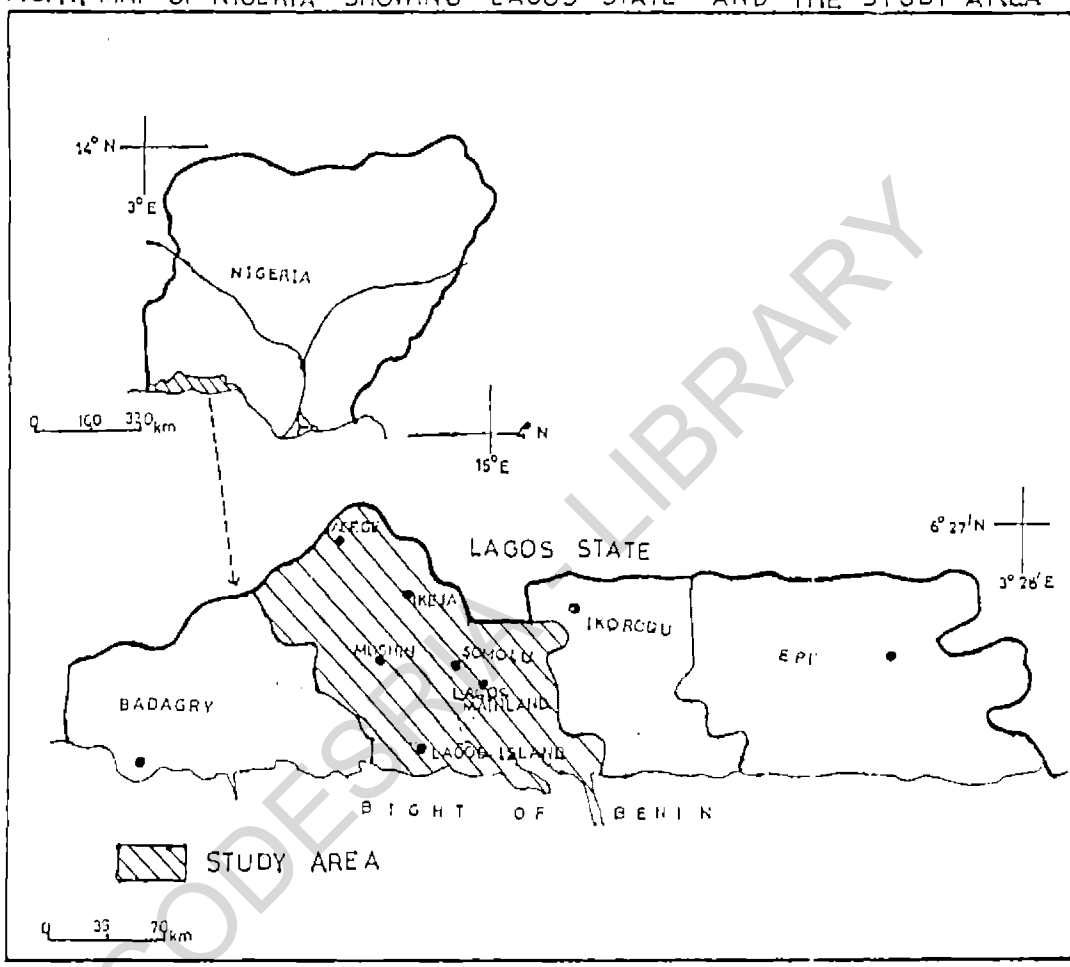
1.2 JUSTIFICATION FOR THE STUDY

Inspite of the numerous theoretical and empirical investigations of the structure of the determinants of housing values in the developed world, there are few urban economic-geographic analysis of housing markets in developing countries (Arimah,1990). In Nigeria, Megbolugbe's

(1983) study of Jos stands out as the pioneering attempt at analyzing the consumption relationships of housing in a privately owned housing market. Arimah's (1990) study of Ibadan identified some of the significant aspects neglected in his study and in the literature. These include: (1) non-consideration of locational attributes in the analysis of housing traits; (2) neglect of the problem of the existence of homogenous submarkets; and (3) the use of aggregative data without specific information on houses.

While explanations were sought to resolve some of the identified gaps, issues of spatial scale for delineation of submarkets and for consideration of neighbourhood variables were not adequately treated in both studies. For instance, Arimah (1990, p.12) defined urban submarkets in terms of neighbourhoods that radiate from city centre to urban peripheries. He thus combined distinct spatial units to constitute income sub-groups. By doing this, variations over space were masked and so the influence of urban housing submarkets could not be identified. Using a smaller scale should bring out distincts homogeneous areas even within a neighbourhood. The nature of demand for neighbourhood preferences of households was also not covered. This work is important first, to account for spatial variation in the demand for neighbourhood attributes of households and secondly

FIG.1.1 MAP OF NIGERIA SHOWING LAGOS STATE AND THE STUDY AREA



Source : Lagos State Handbook, 1988

serves as the country's commercial centre. It is situated on latitude 6^0 27′ North and longitude 3^0 28′ East along the West African coast. With an annual population growth rate of about 13.6 percent (about 5 times as fast as the national growth rate of 2.8 percent). Lagos is Africa's second fastest growing urban centre after Cairo, being a focal point for regional, national and international trade and served by significant, and often overloaded road, rail, ocean and air transport facilities.

The choice of the study area, (Metropolitan Lagos) is based on many factors. First, the housing markets- submarkets are very well developed in Lagos. Consequently, it is possible to identify and analyse variations. Secondly, comprehensive data is available on property values in the state. Lagos remains one of the states in Nigeria with a comprehensive survey of all its buildings following the valuation of the properties carried out throughout the state in 1991. There is periodic review of valuation data. The data from this source are expected to be useful in the explanation of the variations of housing attributes over space. It will also improve the understanding of the effects of location and neighbourhood on urban housing values.

Obtaining reliable and accurate information on housing units as in the case of Lagos State constitute a crucial step

in a better understanding of the structure of housing market in Nigeria. The research will ascertain both the degree of absolute price effects of houses on each other and the differential contribution of various housing attributes in different neighbourhood structures. The results of the findings will be compared with the common assumptions of western market models to determine their applicability and relevance. Also, the findings will be compared with previous works in other developed and developing countries (Ndulo,1986,1985; Shefer,1990; Jimenez and Keare,1984; Malpezzi and Mayo,1987; Willis et al.1990) to see their similarities and differences.

Nigeria contains the largest collection of urban housing markets in sub-saharan Africa (Megbolugbe, 1989). Because of its economic and political nature and importance, information on the behaviour of Nigerian housing markets may provide a better base for extrapolation to the remainder of sub-saharan Africa. This, in turn, may allow one to estimate better housing programme costs and benefits for these countries. Knowledge of how the monetary contribution of each structural attribute varies across the urban landscape, will enable planners, estate valuers and other professionals to predict the effects of changing neighbourhood quality on housing prices. In relation to rating and tenement systems, houses

could be priced in a more scientific manner. These should lead to an improved understanding of the effects of neighbourhood and location on housing values.

1.5 THE PLAN OF THE THESIS

This thesis is divided into eight chapters. Following the introductory chapter is the conceptual/ theoretical framework, literature review and the research methodology for the study. Chapter three examines housing in metropolitan Lagos. In the fourth chapter, the role of neighbourhood and locational factors in the determination of house prices is examined, while chapter five, explains that the measurement of housing values through spatial scales of investigation within the cities can yield different results for the analysis of housing submarkets. In chapter six, the variations that exists in urban housing market segmentation (housing submarkets) and the housing values are examined. The seventh chapter evaluates the relative effects of housing attributes on house prices. A test for house prices/ values variation by location and neighbourhood in cities is also carried out. The final chapter summarizes the major findings and discusses the implications of the research findings.

CHAPTER TWO

CONCEPTUAL FRAMEWORK, LITERATURE REVIEW AND METHODOLOGY

2.1 INTRODUCTION

The analysis of neighbourhood and locational values on housing require that we focus on housing at both micro and macro levels. The micro is the household, while the macro is spatial and relates to areas within the city. There are therefore two sets of theories: urban micro-economic and macro-economic theories that provide conceptual issues for the study. The first includes the trade-off models and their more recent reformulations, the hedonic model and the expansion method. While the second involves the urban spatial structure and the ecological approach to urban land values. The chapter also explains the research methodology which includes the mode of sampling, data collection and analysis. While the former provides a more quantitative approach to the investigation, the latter approach is more general. We shall begin with the latter.

2.2 THE MACRO-ECONOMIC THEORIES

2.2a Theory of Urban Land Values

Theories of urban spatial structure and residential location are concerned primarily with land values and their distribution within the urban area and are only marginally

relevant to housing values. In fact, the first attempts to deal with land values appeared among the philosophies of the eighteenth century and were oriented towards agricultural land. The nineteenth century economic world was dominated by two conflicting views of land rent. The first was expressed by Richardo as early as 1817, while the second was formulated by Wicksteed late in the century (Romanos,1976). Richardo's treatment, considered fundamental until recently (Romanos, 1976,p.6), is based on the notion of land fertility. The analysis then, is devoted primarily to fertility differentials since at that time agriculture was still the principal economic activity. However, its application to urban land is of little relevance because what makes urban land valuable is certainly not fertility.

The theory of location differential rent was developed by Johann Heinrich von Thunen a few years later. The Richardo/Von Thunen model of agricultural production became the basis of the voluminous literature of urban land values and spatial structure. Their idea came to be applied to the location of urban activities first by Hurd (1903), and later by Haig (1926). Hurd (1903), following closely von Thunen's theory for agricultural land, outlined a theory of urban land values and urban structure. In his treatment, utilities compete for locations in the city and land goes to the highest bidder.

Hurd's (1903) analysis, while a starting point for twentieth century real estate economics, did not contribute much to the study of residential land and its location. Haig (1926) later developed a theory of urban land values which introduced the new concept of the complementarity of land rent and transport costs.

Of significant importance is the fact that Haig's theory is the first to consider residential land. The choice of residence is based on the estimation of site rent, time value, and transport costs. Lot size is not important and was not considered. While Haig's theory provides a good analysis of the role of costs of friction in urban locational decisions, it is nonetheless insufficient to completely explain such decisions. This is especially so with regard to residential land use.

2.2b Ecological Approaches to Urban Land Values

The economic and human ecological analyses of urban structures also provide a number of elements explaining the location behaviour of households and groups. Models based on theories of von Thunen and Losch (1966) defined neighbourhood by distance, showing how identical activities would emerge at similar locations due to market forces, leading to hierarchies of activities both within and among regions. The three most

important organizational schemes were proposed by Burgess (1925), Hoyt (1939), and Harris and Ullman (1945), and are known respectively as the concentric zone concept, the radial sector concept, and the multiple nuclei concept. Burgess's (1925) hypothesis, was an offspring of the Chicago school of urban sociology. Hoyt's theory, on the other hand, was suggested as an improvement to the first and came from the land economists. Finally, the multiple nuclei hypothesis was the result of an "interdisciplinary" attempt to explain urban structure.

Burgess (1925) theory of "concentric zones" initially analyses the expansion of the city, and then discusses the "processes of urban metabolism and mobility" which are closely related to expansion. The model's relevance to housing study was the attempt to explain urban growth according to the choice of residential locations. Hoyt's (1939) main argument is that different income groups tend to live in distinct areas which, instead of occupying entire rings around the Central Business District, are sectors around it. Thus, there are well defined, sector shaped, high income residential areas adjoined on one or both side by middle income areas. The Burgess (1925) and Hoyt (1939) theories assume that a city has but one dominant centre, although the sector hypothesis makes provision for the existence of alternative urban centre. The

problem remains that of the monocentric assumption.

The concept of multiple nuclei was expanded by Harris and Ullman (1945). They observed that the nuclei are either pre-existing agglomerations which become urban nuclei as the areas between them are filled through urban growth, or new centres emerging from the need for certain types of services as the size of the urban area increase. Furthermore, because of their different origins, the functions performed by these nuclei differ from centre to centre and from city to city. The relevance of the model to housing is its capability to identify different housing locations and neighbourhoods and housing submarkets.

The discussion of the real estate and human ecology approaches to urban residential location reveals that both have contributed significantly to the understanding of the urban phenomenon. The economic and social aspects of human behaviour were analyzed and used to explain why people choose specific areas of the city to live in, and why there is such a deviation from the patterns theoretically suggested. Athough, both schools provided explanations for the various location trends, regularities, and deviations, they nevertheless failed to provide quantitative or quantifiable measures to make empirical testing possible. This is the subject of the next set of models.

The macro-economic approaches to the study of housing are highly aggregative and so could make only general statements in terms of gross distribution. They are thus not very suitable for evaluating household behaviour at micro levels.

2.3 URBAN MICRO-ECONOMIC THEORIES

Urban micro-economic models are models that explain household location behaviour and they offer valuable insight into city structure. They explain a range of residential locational phenomena that have actually been observed in urban areas. That is, within a set of needs and constraints, a household must specify its preferences, identify the part of the available supply which meets its preferences, and then compete with other households in the market for a particular residential location.

The preferences of individual consumers of housing units have different impacts on the housing values in different locations and neighbourhoods. This necessitated the focus on urban housing at the household level. The earliest contributions of micro-economic residential location theories and models to the analysis of urban spatial form are set out in the works of Alonso (1964), Wingo (1961), Kain (1962), Muth (1969) and Beckmann (1969).

2.3a Trade - Off Models

Theoretical developments following a trade-off approach first appeared in the late fifties (Alonso,1964) and have continued to appear due to the popularity and wide acceptance of the underlying assumptions. Alonso's (1964) model is basically an applied refinement of the von Thunen analysis of land rent and land uses at the micro level of households and firms. It describes a process through which households and firms compete for particular lots of land in a way that will maximize efficiency and satisfaction for the competitors. Alonso's model has potential applications in understanding urban spatial structure and its market equilibrium but there are some criticisms of its assumptions and its operation.

Wingo (1961) developed a similar model about the same period with Alonso. The model is also a static equilibrium model employing a market mechanism through which households minimize their location costs by choosing between the size and accessibility of a site. Since Alonso treats space and accessibility preferences as interrelated, it serves as the fundamental difference between the Wingo and Alonso models. In addition, Wingo gives in-depth treatment to the pivotal factor of transport costs, and this gives a distinctive character to the model.

Kain (1962) conducted a similar study and incorporates

the general theory of location common to all previous equilibrium models in his model. It also emphasises transportation in the same fashion as the Wingo model. However, the main axioms on which this model is based is that accessibility (or its inverse, transportation costs) will influence the households choice of residential location. The model proves by the use of statistical information and tests the theorem that households substitute journey-to-work expenditures for site expenditures, and that this substitution depends primarily on household preferences for low density rather than high density residential services.

The most complete analysis of residential location using the state micro-economic equilibrium approach was presented by Richard Muth (1969) in his cities and housing (Romanos,1976). Muth's approach differs from Alonso's in two important ways. First, Muth uses housing services combining lands, size of housing structure, and other dimensions of the value of housing. Alonso, however, primarily considers location and size of the residential lot. Secondly, Muth considers household income as one of the determinants of transportation expenditures. Furthermore, while Muth was concerned entirely with the housing market and says very little about the location of other urban activities, his model development rests on three sets of axioms concerning housing services,

transportation costs and the centres of non-residential activity.

The Beckmann (1969) model represents the pioneering work on equilibrium micro-economic model of residential location. It gives a clear solution of the rent, density, and income variables, and partially explains the form of the contemporary city. Two axioms constitute the frame of the model. 1.Every household chooses its residential locations so as to maximize the amount of living space that it can occupy for its housing expenditure; 2.The average household expenditure on residence and commuting is a well-defined function of income; the commuting costs function being a linear one. Based on these axioms, the Beckmann formulation proves a model which determines the market solution and his model has always been used as a starting point.

However, the trade-off models explain the nineteenth century city rather than the contemporary metropolis. Empirical research has indicated that a number of phenomena explained by the trade-off models are of declining importance and magnitude in today's metropolis. Some scholars (Romanos,1976) believed that micro-spatial analysis which had achieved a high degree of sophistication and refinement could no longer limit its interests to the purely economic aspects of the problem. Instead, they felt it must also handle other

non-economic variables. This school of scholars attacked primarily the excessive treatment of the concept of accessibility. It could then be concluded, as observed by Romanos (1976), that trade-off models have somehow over-emphasized both accessibility to a major centre of employment and the trade-off between accessibility and space. Furthermore, they have under-estimated the importance of neighbourhood, environmental, and social considerations.

2.3b Criticisms of the Micro-economic Theories

In resolving the operational problem of monocentric trade model especially as it relates to urban housing market, a number of alternative modifications have been developed (Anderson, 1962; Harris, 1968; Stegman, 1969; Siegel, 1970; Richardson, 1971; and Quigley, 1972). The alternative models are primarily concerned with choice of house, selection of residential area, and the environmental considerations in deciding on where to locate.

Anderson (1962) attacks the concept of neighbourhood dependence upon a major concentration (CBD). He argues that such concentrations have decreased in importance in recent years, and that no direct relationship exists between the concentration and the characteristics of the residential neighbourhood. He also suggests that emphasis should be given

to the pattern of social relations among sub-groups, the major residential values held by members of the community and, most important of all, the community power structure. This study believes that the suggestion is very essential in neighbourhood setting.

Harris (1968) suggests that neighbourhood considerations are important because the preferences of his survey, the American public: "... extend not only, and possibly not primarily to low density, but rather to good housing conditions, neighbourhoods cleanliness, and possibly to novelty or non-obsolescence of the housing stock". Furthermore, he notes that the tendency of higher income and status groups to segregate themselves socially and geographically may indicate that social preferences are the determining forces in the residential location decisions of such groups.

Stegman (1969) also questions the pre-eminence of accessibility in explaining housing consumer behaviour. He offers empirical evidence that neighbourhood considerations are more important to locating households than accessibility to employment. Such considerations include the quality of housing, amenity, and environmental conditions rather than more residential space. He also acknowledges the fact that the functions attributed to the CBD by trade-off models are no

longer present to the same extent as in the past. Thus, basic urban services have become more accessible to sub-urbanites because of both decentralization of work and shopping activities, and development of urban expressways making the central city more accessible. The result of these changes, it is argued, is that "large numbers of sub-urban families do not have to trade off accessibility for savings in location rent: they can have both" (Romanos, 1976) .

The dispersion of employment opportunities is emphasized by Siegel (1970,p.7). He concludes that with decentralized job locations, urban density patterns are quite unlike those generated by the simple von Thunen-type approach. Siegel (1970) attributes the demand for a particular residential location to the socio-economic characteristics of the neighbourhood, the nature and availability of public services and amenities, the site characteristics associated with the location, as well as accessibility to employment.

Richardson's (1971) behaviourial model also argues that for owner-occupiers, housing preferences (including the desired type of area and quality of the environment) and financial constraints (e.g. household income and the availability of mortgage finance) are the primary factors in a residence location decision. Journey-to-work costs are only a secondary determinant and act as a constraint, i.e., they

provide a maximum commuting limit to travel time. Therefore, a household will locate at that site which most satisfactorily meets its environmental and size preferences. Quigley (1972) quoted in Romanos (1976), provides an excellent discussion of housing submarkets. He introduces the importance of a heterogenous housing stock and the problems arising from neglecting its durability and inflexibility to change.

2.4 NEW DEVELOPMENTS IN THE MICRO-ECONOMIC THEORIES OF HOUSING

Further studies on micro-economic theories of housing have been able to identify the importance of disaggregated data and segmentation of housing. This has led to housing been identified as multi-dimensional good differentiated into a bundle of attributes that vary in both quantity and quality. The development have improved the conceptual work of the bid rent, and introduced hedonic model and other methods of empirical importance. In this section, we focus on models that help to understand the components of house values. The models explain the housing attributes as they vary in different locations and neighbourhoods. While bid rent emphasises maximising individual satisfactions where housing units are sold to those consumers offering the highest for them, the hedonic model explains the

relationship between households housing attributes and house values. The expansion method helps in evaluating the effects of specific contribution of housing attributes on house prices.

2.4a Bid-rent

Wheaton (1977) introduced the idea of a bid rent approach to housing demand. He based his model on the bid-price notion of Alonso's (1964) location and land use. In this short-run housing demand approach, units of housing are sold to those consumers offering the highest for them, a process which in equilibrium is tantamount to maximizing individual utilities. The advantage of viewing the market in this 'dual' manner is that it suggests a new method of empirically estimating consumer housing preferences. These results not only yield an insight into the determinants of housing demand, but also provide a foundation for simulating the equilibrium process of urban housing markets.

Follain et al. (1982) also utilized the bid-rent to estimate households' willingness to pay for various housing attributes in San Francisco Bay Area and Seoul, Korea. While Galster (1977) used the approach to investigate the issue of housing discrimination with respect to race. The bid-rent approach appears much more convenient when the researcher has

access to a large data set, because as the data decreases in size the possibility of segmenting households on the basis of identical levels of utility reduces to a minimum (Arimah,1990). The parameters of the utility function do not make for the utilization of this approach despite its strong theoretical underpinnings.

2.4b Hedonic Price Model

The hedonic technique was first suggested by Court (1939), but the hedonic price model was developed by Griliches et al. (1971) initially for the purpose of estimating the value of quality change in consumer goods. Rosen (1974) has used the concept to analyze the supply and demand of the characteristics which differentiate products in competitive markets. When applied to the hedonic model, housing is a multi-dimensional good differentiated into a bundle of attributes that vary in both quantity and quality. Accordingly, the hedonic housing price model becomes an operational tool that functionally links housing expenditures to measure of attributes of houses.

The classical hedonic price model poses a relationship between housing prices and traits. The housing traits can be classified into three categories: structural traits (such as square footage, building age, roof cover, and plumbing

fixtures) denoted by S; neighbourhood traits (such as school quality, road quality and availability of electricity, water and other vital public services) denoted by N; and locational traits covering access to economic, social and political facilities (such as distance to CBD, shopping centres, parks and other recreational facilities) denoted by L. Thus, the market prices of housing, denoted by H vector, where h is any unit of H are generally expressed as:

$$P_{hi} = P_h(S_{ij}, N_{ik}, L_{im}) \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

The partial derivative of the Hedonic function with respect to any trait in equation (1) is interpreted as implicit marginal trait prices. The function P_h is the hedonic or implicit price function for H. The implicit price of a characteristic can be found by differentiating the implicit price function with respect to that characteristic. That is

$$P_h / N_k = P_{NK}(N_K) \quad \ldots\ldots\ldots\ldots \quad (2)$$

This gives the increase in expenditure on H that is required to obtain a house with more than one unit of N_K, ceteris paribus. If equation (1) is linear in the characteristics, then the implicit prices are constant for individuals. But if equation (1) is non-linear, then the implicit price of an additional unit of a characteristic depends on the quantity of the characteristic being purchased (Can,1989).

It is hypothesised by Can (1989) that the household's demand price or willingness to pay for N_K is a function of its level, income and other household variables which influence tastes and preferences. In other words

$$W_i = W (N_{ki}, M_i, ...)$$

Each household observes $P_N (N_{ki})$ is taken to be a measure of W_i. The benefits in Hedonic model are that they help in observed changes in market valuations of housing consumption.

Since the publication of Rosen's (1974) article, the hedonic techniques has been used to investigate aspects of housing markets in the West, which include taxes, prices, public amenities, racial discriminations and housing quality (Megbolugbe, 1991). Dubin and Sung (1990) summarized the surveyed studies used for some socio-economic status of the neighbourhood (Anderson and Crocker, 1971; Goodman, 1978; Harrison and Rubinfeld, 1978; Kain and Quigley, 1975;Kern,1979, Li and Brown 1980; Palmquist, 1984), public services (Cobb, 1984; Follain and Malpezzi, 1981; King and Mieszkowski, 1973; Nelson, 1978; Schnare, 1976; Smith, 1978) and racial composition (Bailey, 1966; Goodman, 1977; Lapham, 1971; Wieand, 1973; Clotfelter, 1975; Jud and Watts,1981) to control for neighbourhood quality. Some of the studies, however, used combined variables to capture neighbourhood amenities. But measures of air pollution are the most common.

Among neighbourhood components race, income, education and condition of (neighbourhood) housing stock are again correlated.

Most urban analysts agree that neighbourhood quality is an important element of the housing bundle. There is little agreement, however, regarding the measurement of neighbourhood quality (Dubin and Sung, 1990). The choice of neighbourhood quality is usually based primarily upon data availability and hence little justification is given for the choice of variables.

Williams (1979) on the Economics of Neighbourhood felt that income is both a direct measure and a proxy for neighbourhood quality. Li and Brown (1980) instead argued that income represent a proxy, rather than a direct measure. They justify this hypothesis by noting that the income variables becomes insignificant when other measures of neighbourhood quality are included in the regression.

In Nigeria, Megbolugbe (1983) in a hedonic index based model of housing demand for Third World cities is the pioneering attempt at analyzing the consumption relationship of housing in a private housing market. While Megbolugbe (1983) studied the city of Jos, Arimah (1990) worked on the urban housing market in Ibadan. Arimah (1990) identified some of the significant aspects neglected in Megbolugbe's (1983)

study and the literature. The shortcomings are as identified earlier in chapter one. Other applications of hedonic calculus in Third World housing market include Ndulo (1986,1985) on patterns of housing demand in Zambia; Sheffer(1990) on demand for housing in Indonesia; Ingram(1981), Strassman(1980) on housing demand and improvement in Colombia. Other related studies are generally considered to provide the theoretical discussions and they include Willis et al.(1990); Malpezzi and Mayo (1987); Ayeni (1974) and Megbolugbe (1986,1991).

2.4c Expansion Method

Expansion method is a sequential approach that uses the multiple regression model to evaluate specific contribution of housing attributes on house prices. It also helps to examine the effects of these housing attributes on house values. The expansion method outlines a routine for creating or modifying models made of a sequence of clearly identified logical steps. As part of the conceptual framework, Casetti's (1972, 1986) expansion method is adopted as the general modelling framework to incorporate housing attributes formally into the traditional hedonic housing price models..

The expansion method has been used in numerous geographical applications for constructing and manipulating

models for the investigation of parametric drift across relevant contexts (Can, 1989; Casetti, 1986; Krakover, 1983; Pandit and Casetti, 1983) but not in the area of housing market. In this study, the expansion method allows for the measurement and quantification of neighbourhood effects on the marginal prices of structural housing attributes.

The expansion methods are used because they are free of spatial autocorrelation (Can,1991). Expansion methods are not only a conceptually more realistic and sound representation of the housing price determination process, but also that they are methodologically capable of accommodating the nature of spatial data sets in geographical applications. The use of expansion methods allows for the quantification of the housing price effects, which is important for realtors and planners in their understanding of neighbourhood dynamics.

The expansion method is both a technique for creating or modifying mathematical models and a research paradigm. In the terminology of the expansion method, it involves four distinct stages in its model generation.

1. an "initial model" is specified, the model is made of variables and/or random variables and at least some of its parameters are in letter form ; it is expressed as :

   $$R = B + mSm + E \quad \ldots\ldots\ldots\ldots\ldots\ldots (3)$$

   where

R = a vector of observed property values

m = a vector of regression coefficients

Sm = a matrix of housing attributes such as size, style and so on.

E = a vector of i.i.d. error terms

2. at least some of the letter parameters in the initial model are refined by "expansion equation" into functions of variables and/or random variables ; in many cases, these are substantively significant indices representing a context;
3. the expanded parameters are replaced into the initial model to create a "terminal model" and
4. the expansions can be iterated, since the terminal models produced by one expansion can become the initial model of a subsequent one.

For example : denote by Y a dependent variable, and X and Z two sets of variables $X_1, X_2, \ldots\ldots X_p$ and $Z_1, Z_2, \ldots\ldots Z_q$

$$p=q$$

Assume an initial model Y=f(X) represented by a linear relation between a dependent variable Y and the X variables

$$Y = f(X) = a_1 + a_1X_1 + a_2X_2 \quad \ldots\ldots\ldots \quad (1)$$

and expansion equations defining the parameters of this initial model into linear functions of the Z variables.

Namely

$$a_0 = c_{00} + c_{01}Z_1 + c_{02}Z_2 \quad \ldots\ldots\ldots \quad (2)$$

$$a_1 = c_{10} + c_{11}Z_1 + c_{12}Z_2 \quad \ldots\ldots\ldots \quad (3)$$

$$a_2 = c_{20} + c_{21}Z_1 + c_{22}Z_2 \quad \ldots\ldots\ldots \quad (4)$$

By substituting the right hand side of (2), (3) and (4) for the corresponding coefficients in (1) the following terminal model is obtained ;

$$\begin{aligned} Y = {} & c_{00} + c_{01}Z_1 + c_{02}Z_2 \\ & + c_{10}X_1 + c_{11}X_1Z_1 + c_{12}X_1Z_2 \\ & + c_{20}X_2 + c_{21}X_2Z_1 + c_{22}X_2Z_2 \quad \ldots\ldots \quad (5) \end{aligned}$$

The expansion method can be considered as a special case of systematically varying coefficients in a regression model. The heterogeneity in the phenomenon under study is reflected in parameter values that differ for each observation. In the terminology of the expansion method, the original simple homogeneous specification is called the initial model, whereas the complex heterogeneous formulation is called the terminal model.

2.5 RESEARCH HYPOTHESES

The hypotheses to be tested in this study are as follows:

1. There are variations in house prices by location and by neighbourhood of cities;

2. Households having high socio-economic characteristics occupy highly valued housing units;
3. The measurement of housing values through spatial scales of investigation within the cities can yield different results for the analysis of housing submarkets;
4. Spatial variation in house prices identified by submarkets may be explained by differences in structural/physical characteristics of houses, neighbourhood attributes and, location in space.

2.6 DATA COLLECTION

This study utilized both secondary and primary sources of data. The secondary data were collected from the Lagos State valuation office. There are 9 local governments divided into 8 areas and consisting of 57 zones in the metropolitan Lagos (see Table 2.1 and Figure 2.1). The total number of properties in the 57 zones is 135,820 (see Table 2.2). In a preliminary field work conducted for this study (between Jan.- Feb.,1992), it was found that tenement rating of properties was carried out throughout the state in 1991. This provided some data that were used in the explanation of spatial variation of attributes in the study area. The valuation of properties in all the local governments contains data and information on the number of houses, the valuation area, owner, area of land,

Table 2.1 ZONAL DELIMITATION OF LAGOS METROPOLITAN AREA

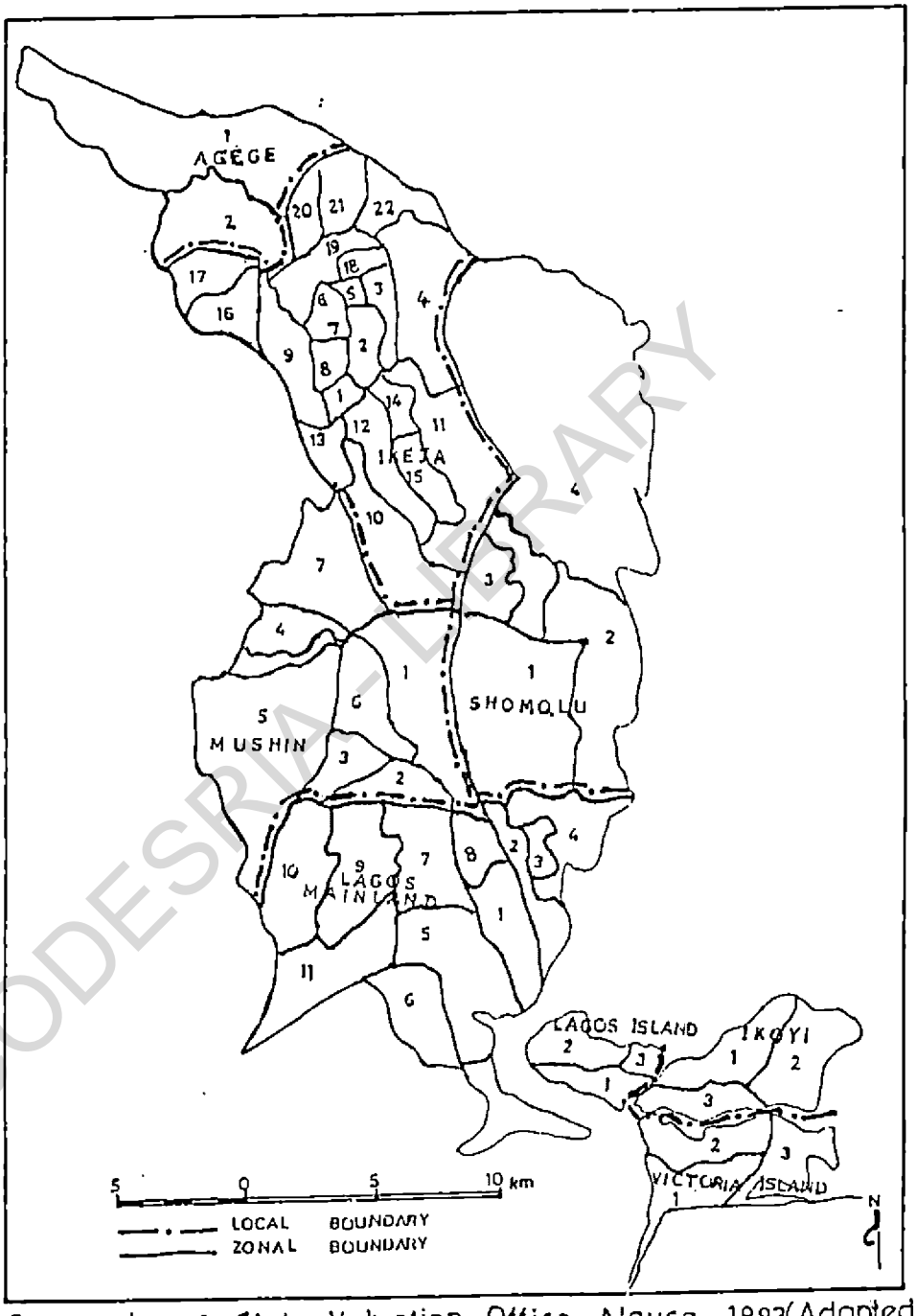
	LAGOS ISLAND	ZONE	AREAS
1		1	Tafawa Balewa Square, Broad Street, Marina, Tinubu Square, Police Headquarters, Federal Ministry of Works & Housing, Onikan Stadium, Kings College, Federal Supreme Court, King George V Road, Moloney Street.
2		2	Idumagbo, Alli Balogun, Jankara market, Oba's Palace, Ebute Ero market, Nnamdi Azikiwe Street, Martins Street, Apongbon Street, Adeniji Adele Street, Mosalashi.
3		3	Kings Cinema, Okusuna, Simpson Street, Foresythe Street, Munday Lane, Pike Street.
4	IKOYI ISLAND	1	Alagbon, Ikoyi Club, Osborne Road, Ikoyi Road, Federal Secretariat, FRCN, University of Lagos Staff Quarters, First and Second Avenue, Ikoyi Hotel, Kingsway Road.
5		2	Ikoyi Park, Bourdillon Road, Queen's Drive, Alexander Avenue, Gerald Road, Macdonald Road, Cooper Road.
6		3	South West Ikoyi, Awolowo Road, Alhaji Masha Cl., Raymond Njoku Street, Falomo, Polo Ground, State House, Obalende, Alhaji Ribadu Road, Okotie-Eboh Street.
7	VICTORIA ISLAND	1	Federal Palace Hotel, NTA, Nigerian Security Printing & Minting Ltd., Bar Beach, Adeola Odeku Street, Idowu Taylor.
8		2	Law School, 1004 Flats, Nigerian Institute of International Affairs (NIIA), Ozumba Mbadiwe, Kofo Abayomi Road, Idowu Martins Street, Eleke Crescent.
9		3	Eko Hotel, Victoria Annex, Maroko, Festival Road, Bishop Aboyade Cole Street

10	LAGOS MAINLAND	1	Iponri, Abule Nla, Ijero, Oke-Ira, Oto, Ebute Metta.
11		2	Oyingbo, Jibowu, Apena, Mainland Hotel, Adekunle Street, Ebute Metta, Ladipo Street.
12		3	Yaba, Rowe Park Sport Centre, Oja Road, Harvey Road, Bierrel Avenue.
13		4	Iwaya, Abule Ijesha, Yaba, University of Lagos, Makoko, Yaba College of Technology, Abule Oja, Bada, Akoka, Onitiri, Onike, St. Finbars College, Talala.
14		5	Eric Moore Road, National Theatre, Iganmu, Ijora, Animashaun Street, Surulere, Ebebe Village Road.
15		6	Badia, Iganmu, Malu Road, Apapa Ajegunle
16		7	Surulere, Alhaji Masha Road, Adeniran Ogunsanya, Itire Road, Akerele Road.
17		8	National Stadium, Oju Elegba, Tejuoso, Surulere
18		9	Surulere, Aguda, Adetola Street, Enitan Street
19		10	Ijesha Tedo, Itire, Surulere, Adesina Street, Agbebi Street.
20		11	Orile Iganmu, Bale Street, Coker Compound.
21	SOMOLU	1	Somolu, Igbobi, Obanikoro, Bariga, Ilupeju, Gbagada, Abula Ijesha, Fadeyi, Pedro.
22		2	St. Finbars College, Bada, Abule Okuta, Oworonsoki, Ifako, Apelehin, Bariga, Akoka.
23		3	Maryland, Anthony Village, Ajao Estate, Mende Village, Chief M.A Okupe Estate.
24		4	Ojota, Ogudu, Ketu, Onikosi
25	MUSHIN	1	Mushin, Town Planning way, Ilupeju, Fatai Atere Way, Palmgrove Estate.

26		2	Idi Araba Road, Ishaga Road, Idi-oro
27		3	Itire Road, Jimoh Jinadu, Iseyin Street - Ijesha
28		4	Ajao Estate, Ejigbo, Okota
29		5	Isolo, Isaga Tedo, Ilasamaja, Isolo Industrial Area
30		6	Papa Ajao Road, Isolo Road, Mushin
31		7	Oshodi, Mafoluku, Ogun Oloko, Shogunle.
32	IKEJA	1	Ikeja, Obafemi Awolowo Way, Adeniyi Jones, Aromire Street.
33		2	Molade Okoya Thomas, Kudeti, Badagry, Akin Laguda Drive.
34		3	New Isheri Road, Agidingbi, ACME Crescent.
35		4	Alausa, Mosalasi, Makinde Street, Imalefalafia Street.
-		5	Industual Zone.
36		6	Ladipo Oluwole Road, Adekunle Fajuyi Crescent, Olutoye Crescent.
37		7	Adeniyi Jones Avenue,Akinola Cole Crescent, Opekete Oloti Village.
-		8	Industrial Zone
38		9	Nurudeen Street, Araromi Street, Independence Street, Ojulowo Imoshe Street.
39		10	Ilupeju, Ikeja G R A, Onigbongbo.
40		11	Olusosun, Wasimi Village, Alhaji Mustapha Street, Oyeleke Street, Balogun Street.
41		12	Akintoye Shogunle Street, Bayode Oluwole Street, Omotayo Street, Esomo Close.
42		13	General Hospital, Kode Square, Olowu Street, Ilori Moses Street.
43		14	Allen Avenue, Bolanle Close, Somoye Tejuoso Close, Olaribiro Street

44		15	Opebi, Henry Adefope Crescent, Olayinka Street, Gafari Balogun Street.
-		16	Dopemu.
-		17	Papa Asafa, Oniwaya
45		18	Ogba Estate, Dideolu Court, Aderinto Street.
46		19	Aguda, Abiodun Jagun, Abisogun Leigh Ogba, Adeniji Street.
47		20	Aguda-Ogba, Kola David Street, Risi Ojikutu, Street Bamgbola Street.
48		21	Ijaye, Oke-Ira, Ogba, Folawewo Street, Kadiri Street, Adesina Street.
49		22	Ojodu, Omole Village, Alhaji Kosoko Street, Moses Adebayo Street.
50	Agege	1	Ifako-Agege, Agbado, Alakuko, Ijaye Ojokoro, Alagbado, Oko-Oba.
51		2	Ipaja, Keke Area, Ifako, Oyewole
52		3	Oniwaya, Papa Asafa
53		4	Dopemu Road, Ajakaiye Street, Agege Bye-pass.

FIG. 2.1 MAP OF METROPOLITAN LAGOS SHOWING THE LOCAL GOVERNMENT AREAS AND ZONES



Source: Lagos State Valuation Office, Alausa, 1993(Adapted)

Table 2.2 NUMBER OF PROPERTIES AND SAMPLE FOR METROPOLITAN LAGOS

S/ No	Area	Zones	No of Properties	Sample Size
1	Lagos Island	1	4,465	42
2		2	3,234	24
3		3	347	18
4	Victoria Island	1	1,023	12
5		2	793	6
6		3	516	6
7	Ikoyi	1	1,565	15
8		2	1,450	15
9		3	1,124	12
10	Lagos Mainland	1	2,972	30
11		2	3,324	33
12		3	1,442	14
13		4	2,374	24
14		5	2,282	23
15		6	2,676	27
16		7	5,608	56
17		8	1,403	14
18		9	5,338	53
19		10	3,760	38
20		11	2,459	25
21	Somolu	1	7,601	76
22		2	10,219	102
23		3	1,423	14
24		4	8,723	87
25	Mushin	1	6,270	63
26		2	3,684	37
27		3	4,311	43
28		4	2,738	27
29		5	3,270	33
30		6	1,834	18
31		7	5,194	52
32	Ikeja	1	1,207	15
33		2	408	12
34		3	72	14
35		4	305	11
36		5	-	-
37		6	99	14
38		7	150	10
39		8	-	-
40		9	428	12
41		10	1,277	15
42		11	5,011	50
43		12	1,079	14
44		13	743	12
45		14	1,415	16
46		15	982	15
47		16	-	-
48		17	-	-
49		18	858	14
50		19	285	10
51		20	730	12
52		21	1,078	15
53		22	1,022	15
54	Agege	1	2,235	22
55		2	6,899	69
56		3	4,027	40
57		4	2,009	20
	Total	57	135,820	1500

Source: Valuation Office, Lagos State Secretariat, Alausa, Ikeja, 1993.

address of property, type of occupier, rental information, type of accommodation, gross value, rateable value, e.t.c (see Appendix 1). Other secondary data consist of relevant information from journals, articles, research reports from government agencies and parastatals.

Primary information were collected from both direct interviews and personal observations. The main primary information was obtained from responses to questionnaires administered by the author and trained assistants between November, 1992 and December, 1993. This is essentially to complement the already available secondary data and other unavailable necessary information. The number of questionnaires administered was 1500 (this was based on about 1% of the total number of houses). The large number of properties made it difficult to cover all because of limited fund. Also, the sample size is based on the statistical belief that where a small sample is selected randomly from a large population, the result will always give a true representation of the area. The selection of the houses covered by the questionnaire was done by both the random and systematic sampling methods in the Metropolitan areas.

Two separate maps were used as base maps. The first map covers the whole area of the Metropolitan Lagos. The second map shows the street names of the different areas of the

Metropolis with the different zones covered by the valuation. The next step was to choose specific number of properties to be sampled along the streets from each zone and this was done by dividing the number of properties in each zone by the number of streets. The selection of the houses from each of the streets chosen then followed. A random systematic sampling was adopted where the random numbers was used by first picking a specific house and then choose the subsequent ones at uniform interval. Where a chosen building is not a residential building, the next residential building was chosen. The housing units covered were purely private residential buildings both owner-occupied and rented. The buildings in which the questionnaires were administered for the neighbourhood and locational attributes were identified for the secondary data where the structural attributes were collated.

The questionnaire was divided into three parts. The first part consists of the socio-economic variables which include the age of the head of the household; sex composition of heads to determine the mobility of immigrants; educational qualification of the family head which will help in determining the type of living of households; occupation of the heads to determine the household classes; size of the households; number of dependants; average income of household

monthly/per annum; e.t.c.(see Appendix 2). The second part consists of some of the variables of spatial location and neighbourhood of housing consumers as reflected in population densities. They include type of tenure of building (owner occupied or rental); number of rooms a household occupies; average monthly rent of dwelling units; transport cost to place of work (transport allowance to be indicated); types of infrastructural facilities provided; noise in the area; physical condition and appearance of the neighbourhood; type of people living in the neighbourhood; parking facilities; playground for the children; garbage collection system; air pollution; location of house relative to place of work; location of schools for children; type of areas preferred to live; e.t.c. The third part consists of the structural variables that are selected from a larger pool of housing attributes, the type of interior, the total number of bathrooms, the number of rooms, the lot size of the house, dwelling age, whether the dwelling is attached or detached, number of stores, availability of garage, the presence of utility room e.t.c.

The research covers all the private residential buildings in Metropolitan Lagos. Lagos remains the most populous and unequalled state in Nigeria with most of its population concentrated in the Metropolitan area. The industrial and

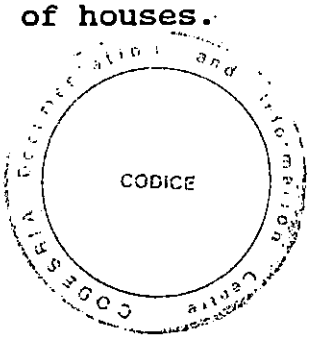
commercial buildings within the metropolis were excluded from the survey. Consequently all the housing units in the research are privately owned or rented units. All houses serving as residential quarters (public residential buildings) for government officials and private institutions were also excluded. The first reason is because the rents paid on such units do not reflect their prevailing market values since they are mostly subsidized. Although all the government housing units were professionally valued by the experts, not most of the occupants choose to live in the area. That is, it is not entirely the decisions of the government workers to reside where they find themselves but where accommodation is available for them. Secondly, some of the government residential quarters located in their present sites have no significant importance with the previous conditions of the environment. They are sited or located where land was available. However, their locations could affect rent or land values on the subsequent private residential units in the area.

2.7 DATA ANALYSIS

Descriptive and inferential statistics were employed to achieve the objectives and test the hypotheses. In order to test for the variations in house values in different locations

and neighbourhoods, the analysis of variance and multiple regression model were used. The hypothesis which states that there are variations in house prices by location and by neighbourhood in metropolitan Lagos was tested. Secondly, to test the hypothesis that households having high socio-economic characteristics occupy highly valued housing units, the analysis of variance, multiple regression model and factor analysis were used. Factor analysis facilitated the grouping of associated variables and showed their performances and importance to the neighbourhoods.

The third hypothesis that was tested using a combination of analysis of variance, multiple regression model, and the non hierarchical technique of grouping. This is necessary in order to show that using proper spatial scale in the delineation of zones and wards, distinct spatial pattern exist within the cities' various housing submarkets. While the fourth hypothesis was tested using the hedonic model and the expansion method. The explanation sought for is that spatial variation in housing values on a smaller scale may be explained by differences in neighbourhood attributes, location in space and physical characteristics of houses.



CHAPTER THREE

HOUSING IN METROPOLITAN LAGOS

3.1 INTRODUCTION

This chapter focuses on the spatial growth and the rapid rate of development in Metropolitan Lagos in order to show the significance and the role of housing in the study area. Since Lagos remains the most populous and unequalled state in Nigeria with most of its population concentrated in the Metropolitan area, it follows that housing for the people should be adequately researched as shelter is one of the foremost priorities of life. Also obtaining reliable and accurate information on housing units as in the case of Metropolitan Lagos constitute a crucial step towards a better understanding of the structure of the housing market in Lagos. The comprehensive survey of all the buildings provides easy access to data and qualitative explanation of the spatial variations of the housing attributes.

3.2 LAGOS METROPOLITAN AREA

Metropolitan Lagos developed from a narrow low-lying Island situated on latitude 6^0 27′ North and longitude 3^0 28′ East along the West African coast. The original settlement on the site on which Lagos grew was first inhabited by fishermen and farmers and was called Eko. This settlement was christened

in 1492 as Lago de Kuramo by the Portuguese who used it only as a harbour in their attempts at finding a route to the far east (Folami,1982).

Lagos comprises the former 70 square kilometres of the Federal Territory of Lagos which was composed of the geographically formed islands of Eko (Lagos Island), Ikoyi, Victoria Island, Iddo-Otto, Ijora and Apapa. The central and most developed of this island chain is Lagos Island. It also incorporates the municipal settlements of Ebute- Metta, Yaba, Surulere, Tin-Can Island (Mekuwen) and the Eti-Osa areas all of which cover 85.53 square kilometres. From this initial settlements, development has proceeded northward to the mainland up to about latitude 6^0 40′ North.

3.3 POPULATION GROWTH

Lagos epitomises the phenomenal growth in urban population that is almost typical of most African cities. Estimates made in the latter part of the 18th and the early part of the 19th centuries gave the population as 3,000 in 1800 (Adams, 1900), 20,000 in 1863 and 40,000 in 1864 (Colonial Possessions, 1863 and 1864). Within the first five years after 1966 (see Table 3.1), the population increased by about 14 percent. The population growth rate for the city took a sharp turn in the 20th century. Between 1901 and 1911, the

Table 3.1 LAGOS CITY POPULATION GROWTH RATE 1866 - 1991

Year	Area Covered in km²	Total Population	Inter-censal Percent-age Increase or Decrease	Rate of Change Per Annum Per 1000 People	Average Inter-censal Growth Rate Per Annum	Annual Rate of Increase
1866	3.97	25,083	-	-	-	-
1871	4.01	28,518	13.7	-	-	-
1881	4.01	37,452	31.3	13	-	-
1891	4.01	32,508	13.2	-	-	2.5
1901	-	41,847	28.7	-	-	5.7
1911	46.62	73,766	76.3	58	-	3.1
1921	52.24	99,690	35.1	31	-	2.3
1931	66.28	126,108	26.5	24	2.3	3.3
1950	70.50	230,256	82.6	32	3.2	8.8
1963	70.50	665,246	188.9	86	8.5	-
1973	-	1443568	117.0	-	-	-
1988 *	405.53	2168163	50.2	-	-	-
1991	405.53	4248963	96.0	-	-	

Source: Population Census of Nigeria 1931, 1950, 1963, and 1991

Note: - Not available * Projection

intercensal increase rose from 28.7 to 76.3 percent. The trend in growth in the latter part of the century has been more dramatic (see Figure 3.1). In the first 13 years, that is 1950 to 1963, the population of the municipality increased threefold from 230,256 to 665,246. In 1973, the intercensal percentage decreased from 188.9 percent to 117 percent and by 1988, it decreased further to 50.2 percent. The 1991 census gave a ridiculous low figure of Lagos Island as 335,300 (Lagos Island and Eti-Osa) and 4,248,963 when the Lagos Mainland figure is added to it (see Table 3.2).

However, these figures contradict assumed rates of growth and projections by the Master Plan Unit of the Ministry of Economic Development and Land Matters in 1980 as shown in table 3.3. Then they estimated the population at 3.779 million in 1978 from which a rate of growth of 9.3 was used to forcast population up to 1979. From 1980 onwards, a declining rate taking into consideration the removal of federal functions from Lagos was used. Thus for 1980, the rate of growth was estimated at 7.27, while between 1985-1990 the assumed rate of growth was 5.6. The rate was 4.37 between 1990 and 2000 A.D. Thus the population of the Metropolis in 1985 would be 6.614 million while in 1990, it was expected to be 8.484 million. The population for 2000 A.D. is expected to be about 12.949 million people, a figure that is said to be conservative

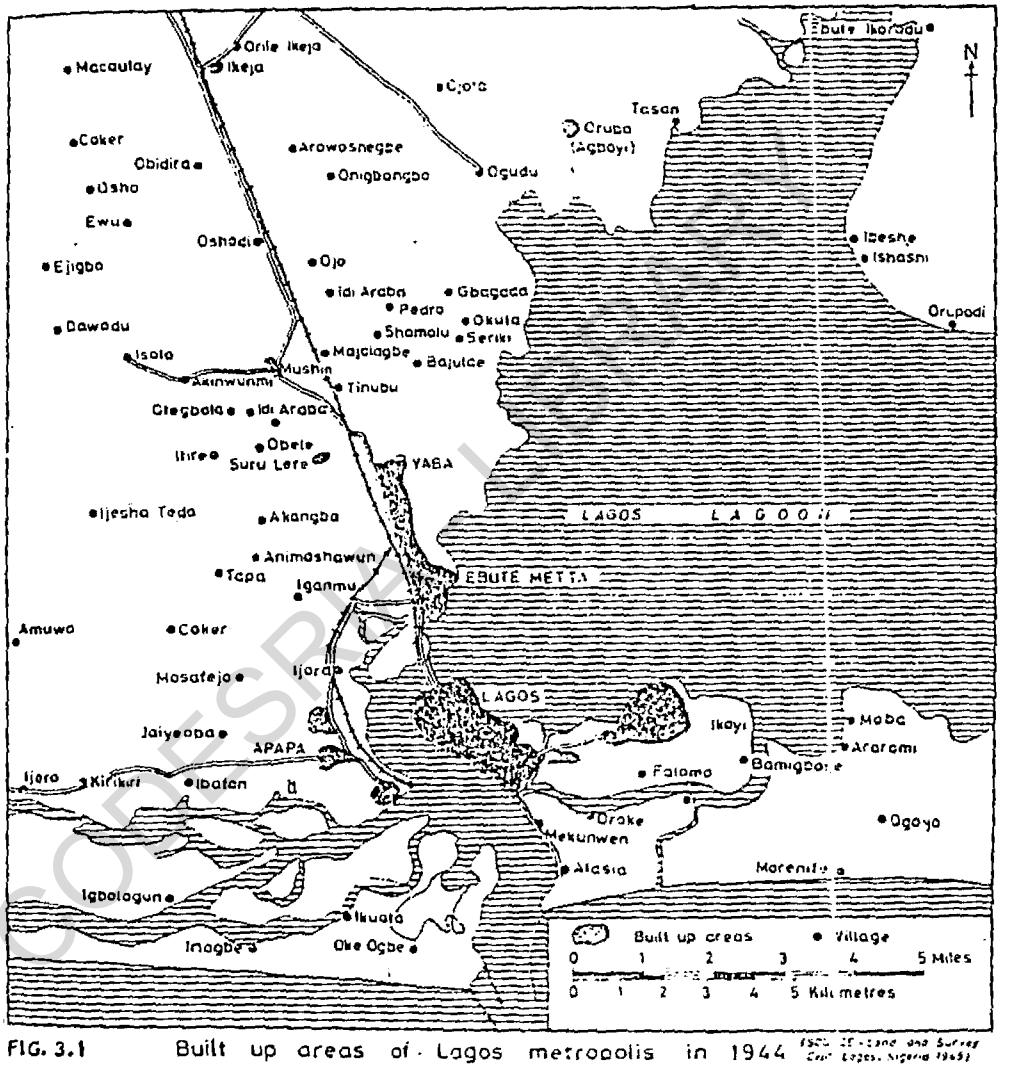


FIG. 3.1 Built up areas of Lagos metropolis in 1944 (Source: Land and Survey Dept. Lagos, Nigeria 1965)

Table 3.2 LAGOS STATE 1991 POPULATION CENSUS (PROVISIONAL RESULTS)

Nos	Local Government	Males	Females	Total
1.	Agege	343,456	306,818	650,274
2.	Badagry *	60,586	58,118	118,704
3.	Epe *	48,530	51,037	99,567
4.	Eti-Osa	97,264	73,684	170,948
5.	Ibeji-Lekki *	12,139	12,686	24,825
6.	Ikeja (1)	340,968	398,794	639,762
7.	Ikorodu *	93,214	88,700	181,914
8.	Lagos Island	82,121	82,231	164,352
9.	Lagos Mainland (2)	458,131	411,470	869,601
10.	Mushin (3)	520,758	466,089	986,847
11.	Ojo *	538,214	473,594	1,011,808
12.	Shomolu	404,147	363,032	767,179
	Total	2,999,528	2,686,253	5,685,781

Source: National Population Census Office, 1992

(1) Including ALIMOSHO *
(2) Including SURULERE
(3) Including OSHODI/ISOLO

* Local Government not considered as part of Metropolitan Lagos

Table 3.3 Population of Lagos 1978-2000

Year	Metro '000	Rate of Growth	Non Met '000	Total '000	% Metro
1978	3,779	9.3	521	4,300	87.88
1979	4,133		547	4,680	88.31
1980	4,518		574	5,092	88.72
1981	4,923		601	5,524	89.12
1982	5,302	7.27	629	5,931	89.40
1983	5,677		657	6,634	89.62
1984	6,048		688	6,734	89.81
1985	6,614		716	7,132	89.96
1986	6,791		747	7,538	90.09
1987	7,178	5.56	779	7,957	90.21
1988	7,580		812	8,392	90.32
1989	7,989		847	8,838	90.41
1990	8,406		884	9,290	90.49
1991	8,787		917	9,740	90.55
1992	9,173	4.37	952	10,125	90.60
1993	9,565		988	10,125	90.63
1994	9,975		1,026	11,001	90.67
1995	10,406		1,063	11,471	90.72
1996	10,861		1,105	11,966	90.76
1987	11,342	4.48	1,147	12,489	90.81
1988	11,842		1,191	13,039	90.87
1999	12,384		1,236	13,620	90.92
2000	12,949		1,283	14,232	90.96

Source: Master Plan Project, Lagos State Ministry of Economic Planning and Land Matters, Lagos, Nigeria, 1980.

(Ayeni, 1991).

The areal distribution of population in Lagos, 1911-1991 (see Table 3.4) shows that in 1911 Lagos Island constituted 76.8 percent of the population while Mainland District contributed the remaining 23.2 percent unit. In 1952, the population reduced to 49.3 percent in the Island, while the Mainland population increased to 28.5 percent. The city outskirts or suburbs which incorporates the new metropolitan settlements constituted the remaining 22.2 percent. The 1963 census gave the areal population distribution as 26.9 percent for Island, 31.9 percent for Mainland District and 41.2 percent for the new settlements. The distribution shows a continuous decrease in population in Lagos city and increase in population towards the hinterlands. This trend is further confirmed by the 1991 census which shows that Lagos Island has 335,300 population (7.9 percent), Lagos Mainland 869,601 (20.5 percent) and the other Metropolitan settlements 3,044,062 (71.6 percent). Generally, the Lagos Metropolitan population has been on the increase since 1911-1991 (see Table 3.5).

3.4 SPATIAL EXPANSION

Two main factors account for the rapid growth of Lagos Metropolitan population - net migration and natural increase. Immigration has been a much more potent factor accounting for

Table 3.4 THE AREA DISTRIBUTION OF POPULATION IN LAGOS 1911 - 1991

					1952 Census		1963 Census		1991 Census
Metropolitan Sub-regions	1911	1921	1931	1950	% of Municipal Population	% of the Metropolitan Population	% of Municipal population	% of the Metro. Pop.	% of the Metro. Pop.
Lagos Island, Ikoyi and Victoria Island	76.8	77.7	71.6	65.4	63.3	49.3	45.4	26.9	8.4
Mainland District	23.2	22.2	28.4	34.6	36.7	28.5	54.5	31.9	20.4
Outskirts (Mushin, Ikeja, Agege, Somolu, Oshodi, Ajeromi)	-	-	-	-	-	22.2	0.1	41.2	71.2

Source: Compiled from the Population Census of Nigeria 1952, 1963 and 1991

Table 3.5 POPULATION OF METROPOLITAN LAGOS IN 1952, 1963 AND 1991

Area	Population in 1952	Population in 1963	Population in 1991	% of Total Pop. in 1991	Inter-censal Increase in % Between 1963 and 1991	Average Annual Rate of Growth Per 1,000 People
Lagos Island						
Ward A	37,450	47,551				23
: B	40,034	79,841				65
: C	74,472	53,450				-
: D	21,761	104,037				158
: E	37,682	158,932	335,300	7.8		140
: F	38,534	95,542				86
: G	17,474	50,753				102
: H	Part of "C"	71,703				-
Mushin	32,079	208,709	986,847	23.2		185
Oshodi	7,284	20,717				97
Itire-Isholo	2,853	30,634				241
Somolu	1,284	64,731	767,179	18.1		
Bariga	477	10,564				
Lagos Mainland			869,701	20.5		
Ajeguale	6,241	18,363				
Aiyetoro	2,833	7,427				
Araromi	3,077	19,379				
Ikeja	6,705	36,923	639,762	15.1		
Agege	12,844	45,986	650,274	15.3		
Total	343,883	1125242	4248963	100		

Source: Compiled from Population Census of Nigeria 1952, 1963 and 1991

Note: Ward C was split in 1963 and from it was carved out Ward H, hence the lower figure recorded for 1963.
Figures for Wards C and H added together for calculation.
Breakdown of 1991 figures not yet released.

the rapid population growth in Lagos. Lagos was settled by immigrants from the immediate hinterland. These were the Aworis, members of a Yoruba sub-group. They were followed by the Ijebus and later by the Binis from a much farther distance to the south eastern part of the coast. During the era of the slave trade, Lagos became an important market for the slaves brought from Porto Novo, Badagry, Hausa and Yoruba lands. However, with the abolition of the slave trade in 1851 and the cession of Lagos to the British government in 1861, which ushered in an improved socio-political era, new groups of migrants were attracted to the city. Such groups included freed slaves from Brazil, Sierra-Leone, and from the hinterland. European merchants, missionaries, Egba christian refugees and traders from the interior also came to Lagos for trading, missionary and political reasons respectively.

By the end of the 19th century, the built up area of Lagos was approximately 4 square kilometre, the main settled area being the Island (see Table 3.6). The settlement of the Egba christian refugees in the Glover layout during this period started the spatial development on the Mainland. After 1900, greater strides were made in the areal expansion of the city and by 1911, the Metropolitan Lagos recorded an area of 46.6 square kilometres. By 1921, the built up area of the Island had by then extended in almost all directions,

Table 3.6 Spatial Growth of Lagos 1866 - 1976

Year	Area Km^2	Remarks
1866	3.97	Lagos Island only
1871	3.97	Lagos Island only
1881	3.97	Lagos Island only
1891	3.97	Lagos Island only
1901	-	
1911	46.08	Lagos Municipality
1921	51.64	Lagos Municipality
1931	65.51	Lagos Municipality
1950	69.68	Lagos Municipality
1952	69.68	Lagos Municipality
1963	69.68	Lagos Municipality
1952	-	Metropolitan Area
1963	-	Metropolitan Area
1974	178.36	Metropolitan Area
1976	271.20	Metropolitan Area

Source: Population of Lagos, 1950 p. 1 and Ayeni, (1981)

particularly eastward where swamps had to be drained. But between 1921 and 1931 there was a shift in residential expansion to the Mainland as a result of the deteriorating housing conditions on the Island. As a result, the area of the city increased from 46.6 square kilometres in 1911 to 70.5 square kilometres in 1950.

Figure 3.1 shows that almost the whole of Lagos Island has been built up by 1944. The built up areas on the Mainland extends from the south-eastern portion of Ebute-Metta to Yaba and to some portions of the south-western part of Apapa. Many villages dot the landscape in areas north and west of the Mainland. Within another decade, new areas were being opened up for development. The Lagos Executive Development Board (LEDB) inaugurated in 1948 was instrumental to the building of new Surulere whilst private developers extended their activities to the outskirts of Mushin, Somolu, Ikeja and Apapa Ajegunle area. Many of these places were formerly villages that have over time been turned to important residential suburbs of Lagos.

Figure 3.2 depicts the change that has been brought about in the residential extent by 1964. This expansion process is on the increase. The whole built up area from Ikoyi Island in the South-eastern part of Lagos Island to Agege in the extreme north forms the Metropolitan Lagos on an area of about 181

square kilometres. Figure 3.3 shows that the areal extent of the built up areas of Metropolitan Lagos in 1993 is about 405.53 square kilometre. Not only has the rapid rate of the population growth contributed to the areal expansion of the Metropolis, it has also affected the distributional pattern of the people.

According to Table 3.4, the major area of population concentration was the Island up to the middle of the century, but this is fast giving place to concentration at the outskirts. Lagos continues to grow with a spiralling population, a constantly extending boundary and ever changing skyline. Hitherto the former Federal Capital Territory of Lagos has its boundary at Fadeyi on Ikorodu road, Idi-oro on Agege motor road and Alaiyabiagba Market at Ajegunle but today, the whole area has grown into a metropolis extending northwards to incorporate such urban areas as Mushin, Somolu, Bariga, Agboyi, Ikeja, Agege, Ojo, Isheri, Ajegunle and Ketu (see Figure 3.4).

At the inception of Lagos State on May 27, 1967, Lagos Island was both the state capital as well as the seat of the Federal Government. However, when Nigeria's federation was restructured into 19 states in 1976, the capital of the state was moved to Ikeja. Lagos state is also made up of five administrative divisions, namely Lagos (Eko), Ikeja, Ikorodu,

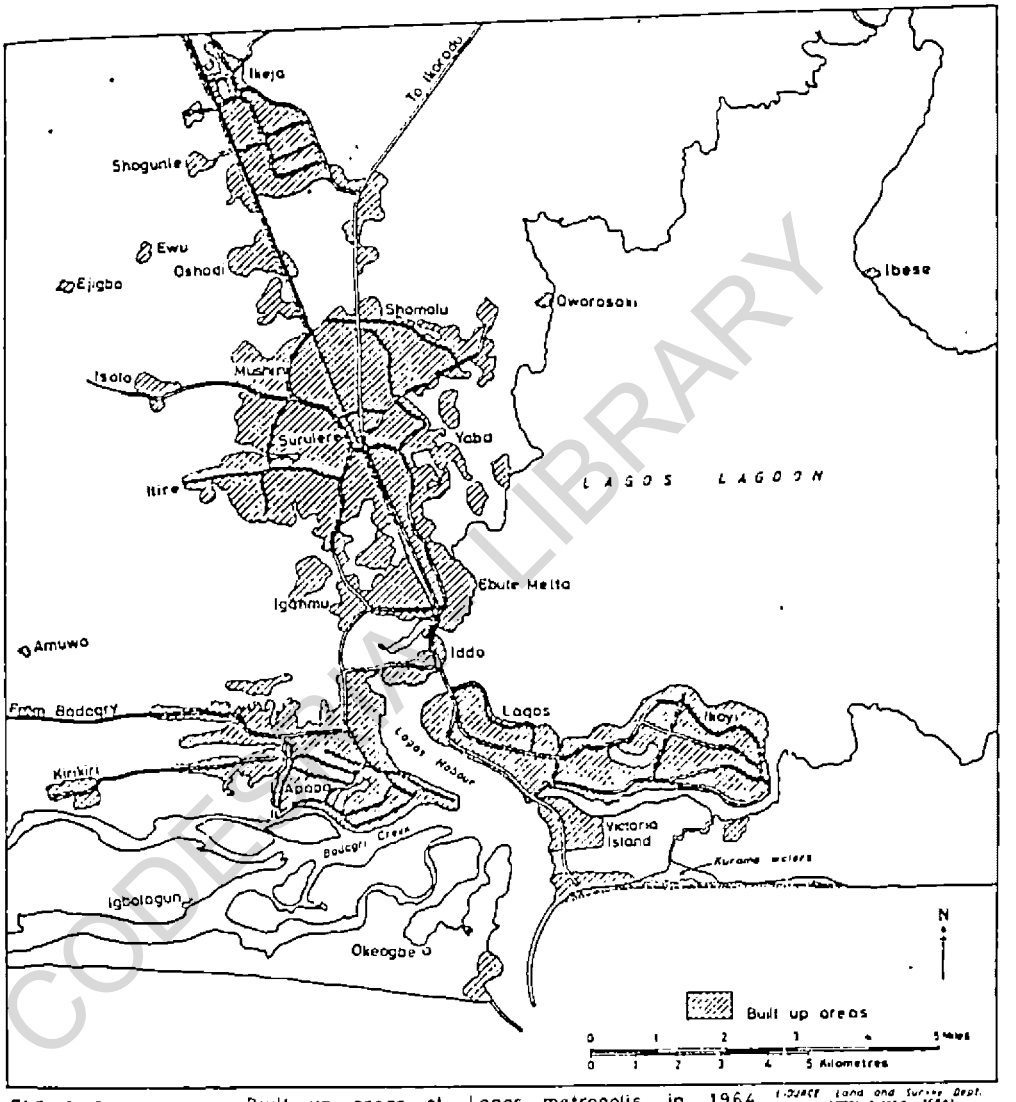
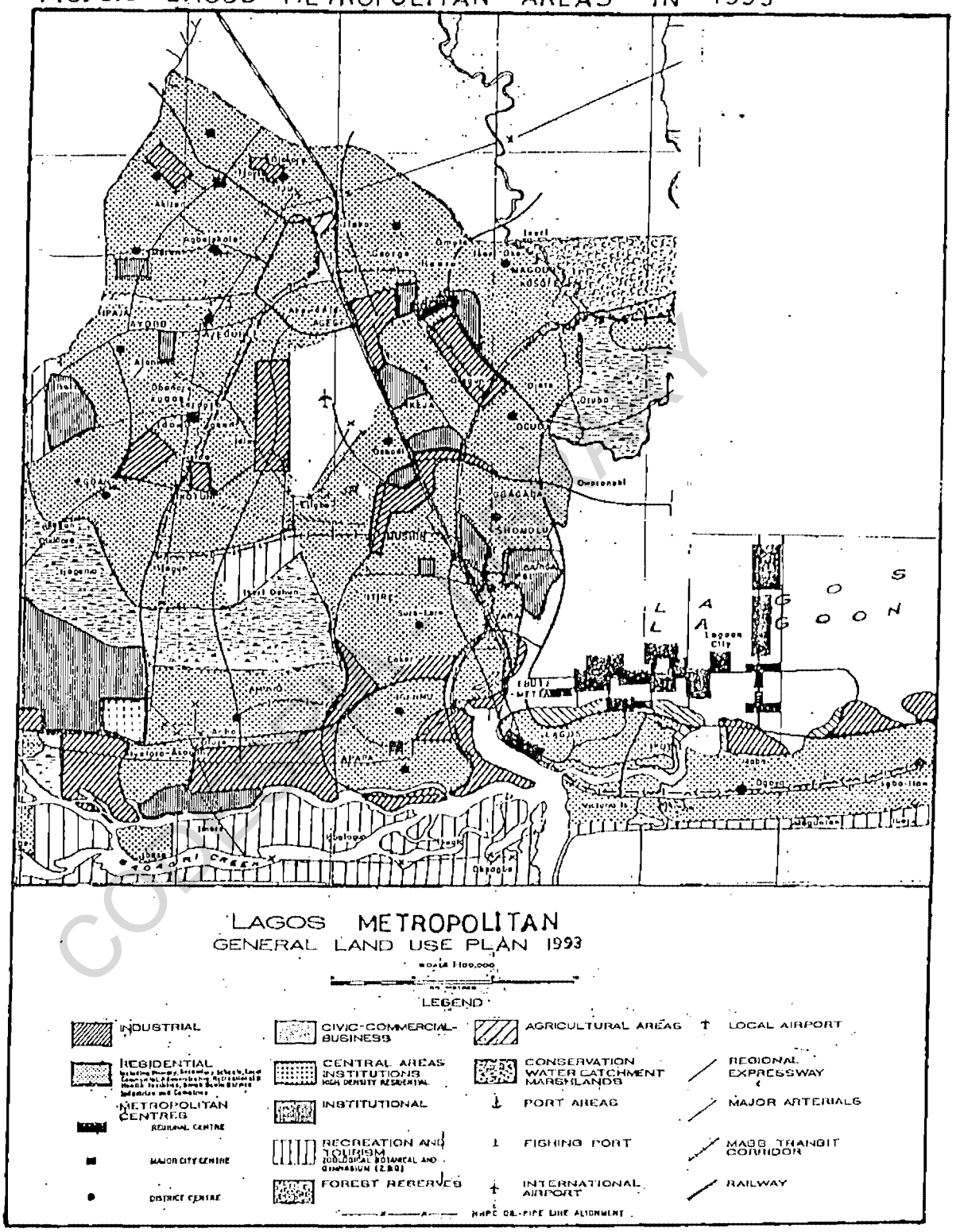


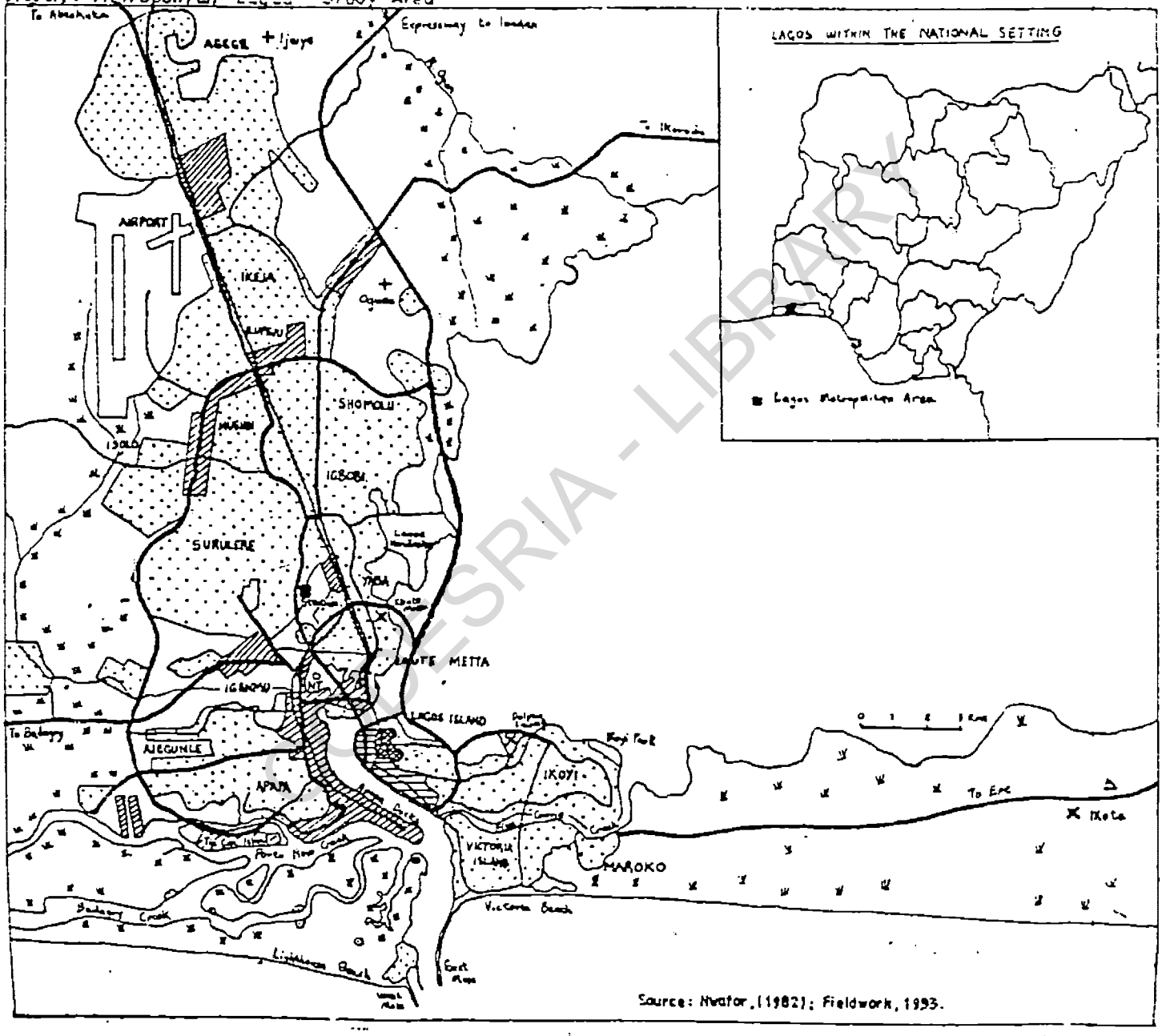
FIG. 3.2 Built up areas of Lagos metropolis in 1964 (UDAICE Land and Survey Dept. Lagos Nigeria, 1964)

FIG. 3.3 LAGOS METROPOLITAN AREAS IN 1993



Source: Lagos State Physical Planning & Development Matters, 1993

FIG. 3.4: Metropolitan Lagos - Study Area



Epe and Badagry. The divisions were created on May 31, 1968 and were further divided into local governments. Only two divisions fall within the Metropolitan Lagos, i.e.Lagos and Ikeja divisions.

The Lagos division is a highly urbanized division consisting of four local government Islets : Lagos Island, Lagos Mainland, Surulere and Eti-Osa with the city of Lagos being the pivot of an ever expanding Greater Lagos and the divisional headquarters. Major settlements in the Division are Tarkwa Bay, Victoria Island, Lagos Island, Badore, Ikoyi, Obalende, Otto, Ijora, Apapa, Ebute-Metta, Yaba, Ajah, Maroko, Iwaya, Surulere and Iponri. Others are Abagbo, Abijo, Ajiran Gbara, Ibari, Itedo, Marina, Sangotedo, Mayegun, Oke-Ira, Ogombo, Magun, Ito-Omu, Okun-Aja, Okun-Ibeji, Morakinde, Moba, Alaguntan, Addo, Langbasa, Ilasan, Igbo-Efon, Ikota and Ikale-Elegusi.

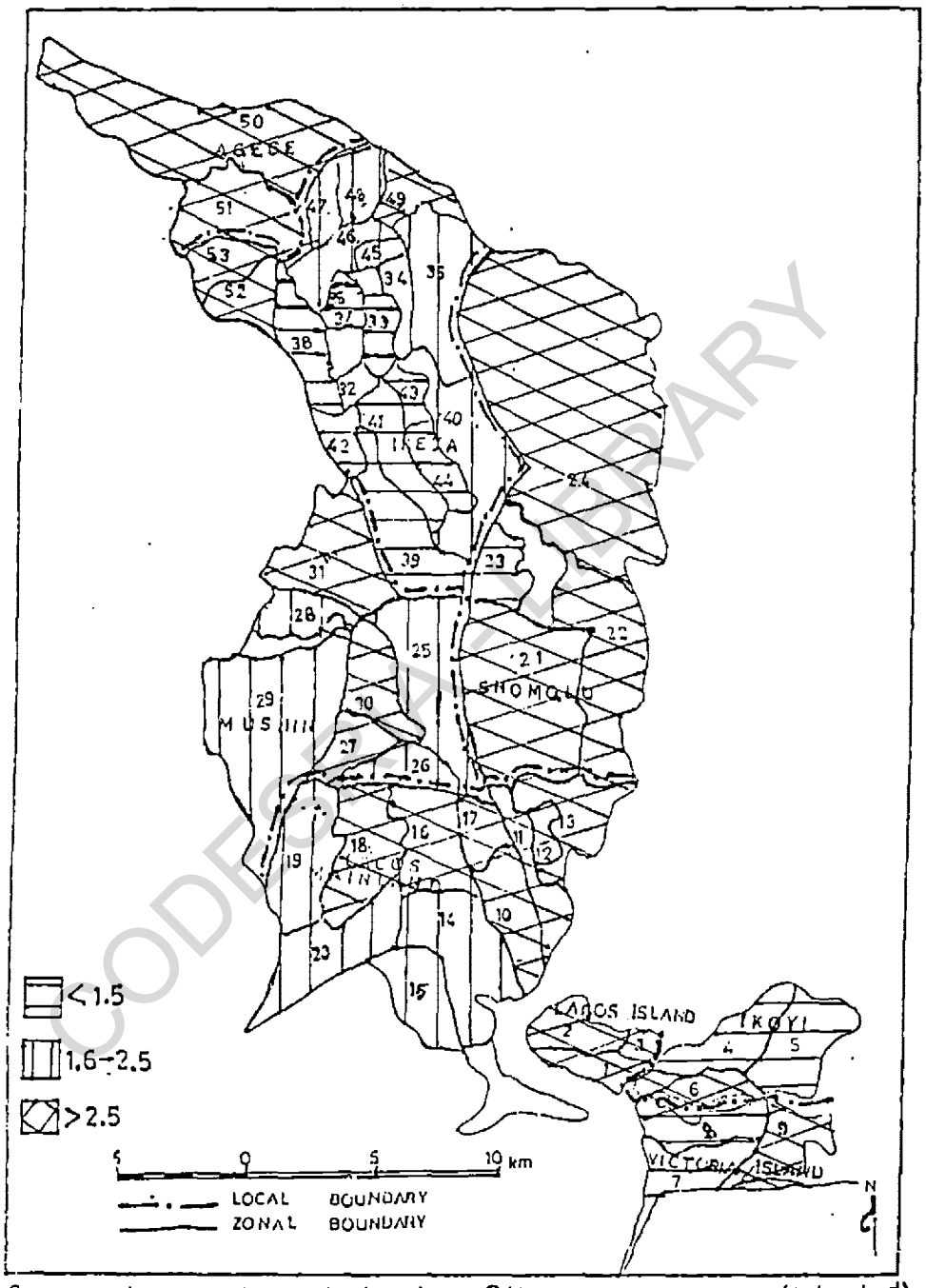
Ikeja division consists of six local government authorities namely Agege, Mushin, Alimoso, Oshodi/Isolo, Somolu and Ikeja which serve as the seat of the State Government and also as the divisional headquarters. There are over 50 settlements in the Division including Isolo, Isheri, Ikotun, Ejigbo, Agan, Akesan, Ketu, Ojota, Shangisha, Oworonsoki, Mushin, Abesan, Igando, Idimu, Ajobo, Iju, Ifako, Agboyi, Ikosi, Somolu, Ipaja, Oregun, Oshodi, Oke-Afa, Ojodu,

Ogudu, Bariga, Ilupeju, Obanikoro, Ogba, Aguda, Agege, Dopemu, Ikosi, Abule-Ijesa and Akoka.

3.5 HOUSING AND THE URBAN SPATIAL STRUCTURE

The growth of housing in Lagos is both phenomenal and unprecedented in the annals of development. The earliest occupied areas of the metropolis is the Lagos Island which started developing with the arrival of different groups of migrants. This Central Business District (CBD) as shown in figure 3.4 is the point of maximum accessibility where majority of the economic activities are located. Major commercial concerns were established on the Island over the years, further concentration of economic activities resulted in its overwhelming importance as the Central Business District. To the north of the CBD is what would represent the second concentric zone. The zone is characterized by high population density, high occupancy ratio and high housing density (see Figure 3.5 and Table 3.7). It is a zone of deteriorating housing conditions. The squalid state resulted from the encroachment of the commercial houses on the residential areas. It has also been due to the increasing extended family sizes of the indigenes without attendant increase in size of accommodation. Many of the indigenes tend to stay put in their traditional houses or area, thus

FIG. 3.5 MAP OF METROPOLITAN LAGOS SHOWING THE SPATIAL DISTRIBUTION OF RESIDENTIAL DENSITY



Source: Lagos State Valuation Office, Alausa, 1993(Adapted)

Table 3.7 Housing and Spatial Structure of Lagos

Description	No of Property	House Values	NPERS	NROOM	Density
Marina	4465	25,670.0 ₦	5.5	2.1	2.6
Oba's Palace	3234	14,337.5	6.3	1.6	3.9
Simpson Street	347	13,700.0	6.0	2.0	3.0
Alagbon	1023	118,000.0	5.4	4.2	1.3
Ikoyi Park	793	188,000.0	5.4	4.0	1.4
Falomo	516	116,250.0	6.0	2.5	2.4
Bar Beach	1565	253,000.0	5.0	4.0	1.3
Eleke Crescent	1450	292,500.0	5.0	4.0	1.3
Maroko	1124	250,000.0	6.8	2.5	2.7
Iponri	2972	8,528.0	5.7	1.8	3.2
Oyingbo	3324	4,094.5	5.5	1.9	2.9
Yaba	1442	17,496.0	3.6	1.8	2.0
Abule Ijesa	2374	7,382.5	6.3	2.1	3.0
Ijora	2282	13,231.4	5.0	2.6	1.9
Apapa Ajegunle	2676	9,177.8	4.6	3.0	1.5
Masha Road	5608	16,247.4	7.1	2.6	2.7
Oju Elegba	1403	8,300.0	8.0	2.2	3.6
Aguda	5338	15,133.9	7.5	2.8	2.7
Ijesa Tedo	3760	8,375.0	6.8	3.5	1.9
Orile Iganmu	2459	9,000.0	6.0	3.0	2.0
Igbobi	7601	13,500.0	6.9	2.7	2.6
Akoka	10219	7,320.0	6.6	2.6	2.5
Maryland	1423	15,040.0	4.6	3.8	1.2
Ketu	8723	7766.7	6.4	2.3	2.8
Ilupeju	6270	10318.2	6.3	2.6	2.4
Idi Araba Rd	3684	9,461.5	5.2	2.4	2.2
Itire Rd	4311	12,000.0	5.6	2.1	2.7
Ajao Estate	2738	17,888.9	4.9	4.0	1.2
Isolo	3270	9,363.0	5.6	2.5	2.2
Mushin	1834	8,500.0	6.5	2.5	2.6
Oshodi	5194	9,055.6	6.7	2.3	2.9
Awolowo Way	1207	27,250	6.5	3.0	2.2
Thomas Okoya	408	50,000.0	7.0	5.5	1.3
Agidingbi	72	27,500.0	7.5	3.5	2.1
Alausa	305	27,500.0	5.0	2.0	2.5
Adekunle Fajuyi	99	52,500.0	4.0	6.0	0.7
Adeniyi Jones	150	32,500.0	8.0	3.5	2.3
Araromi St.	428	8,000.0	4.5	6.0	0.8
Ikeja GRA	1277	53,750.0	6.5	7.0	0.9
Olusosun	5011	19,250.0	6.5	2.8	2.3
Sogunle St.	1070	30,500.0	5.8	4.3	1.4
General Hosp.	743	30,500.0	5.7	3.0	1.9
Allen Av.	1415	106,000.0	8.6	6.8	1.3
Opebi	982	71,250.0	6.0	5.3	1.1
Ogba Estate	858	16,666.7	9.7	4.3	2.3
Adeniji St.	285	20,000.0	7.5	4.5	1.7
Aguda Ogba	730	17,666.1	4.3	2.0	2.2
Ijaye	1078	7,000.0	5.5	2.5	2.2
Ojodu	1022	9,000.0	5.3	2.0	2.7
Alagbado	2235	6,333.3	6.6	2.2	3.0
Ipaja	6899	6,658.3	6.1	2.3	2.7
Oniwaya	4027	7,357.1	5.9	2.2	2.3
Agege Bye-Pass	2009	5,000.0	7.3	2.9	2.5

Source: Valuation Office, Ikeja, Lagos; Field Work, 1993

aggravating the slum problem.

This zone is followed by the working men's zone, a zone occupied mainly by industrial workers who have escaped from the second zone as their income increased. However, since this group of people still desire living close to their working place, they choose this adjacent zone which is a zone of second generation migrants. Obalende, which is to the east of the Island and Ebute-Metta and Yaba areas on the Mainland can be regarded as the working men's zone. This zone does not form a complete circle around the second zone, thus introducing a departure from the postulate of the concentric zone. This is because of the indentation of the areas included under this zone by sea inlets. However, some of the housing characteristics postulated for the working men's zone in the concentric zonal model are evident in this area. The zone is an area of high occupancy ratio and high housing density but the living conditions are much better compared with those on the Island. The houses are of medium grade, multi-family tenements. On the contrary, exceptionally low housing density areas and relatively high income residential portions with relatively good supply of social amenities are found in certain places such as the Railway Quarters in Ebute- Metta and north eastern part of Yaba. The initial clustering of people in these localities illustrate the settlement pattern

postulated by the sector model.

The development of Yaba in the northern part of the zone started with the movement of displaced people from the slum clearance scheme that was carried out in some parts of the Island in the 1930s. Hence, the enforcement of government directives rather than the affluence of people led to the settling of this area/ neighbourhood. All these various zones constitute distinct and different neighbourhoods and are shown in chapters four and five.

The fourth zone is characterized by decreasing residential density of single family dwellings. This zone is for the affluent members of the city, essentially the middle income class, of white collar employees and professional people. To the south eastern periphery of the metropolis is this high income residential area of Ikoyi. This area was planned in the early 1900's to accommodate the expatriate civil servants. Up till today, it is essentially a high income area for top ranking officers, but houses a mixed population of Nigerians and Foreigners (see Tables 4.4 and 4.11). By virtue of its plan and the calibre of its residents, Ikoyi's housing density is very low. Proper layout, good infrastructure and sufficient social amenities are some ingredients that make for high quality of life in this residential area. But the invasion of commercial activities in

this area is a cause for concern especially the Ikoyi S.W. Also, it is disheartening to note that the only recreational area in the neighbourhood - Ikoyi Park has been sub-divided into residential plots and built on. However, this area is still applicable to Burgess' zone, and part of Hoyt's explanation of a high income residential area developing along waterfront.

Reclamation works have been carried out on the Victoria Island and subsequently developed into a high grade residential area similar in characteristics to Ikoyi. The development of former Maroko (a sub-standard residential area), now Victoria Island Annex and Lekki Peninsula into a standard residential area is fast taking place.

Conditions of the residential areas of Apapa, Surulere, Mushin, Bariga and Somolu, which are on the mainland, vary considerably from one another and deviate much from the postulates of any of the three models of urban structure. The eastern portion of Apapa is a high income residential area. The area was planned as a European reservation to house expatriate employees on the Apapa industrial estate at about the same time as Yaba in 1930. On account of this, the area has a low housing density. The area now consists of a mixed population of Nigerians and foreigners(see Table 4.4).

On the western side of Apapa, which happens to be the south-western periphery of the metropolis, is characterized as a low income area with poor housing conditions. The area was initially designated as the domain of the low income factory workers. It is separated from the high-income area by a canal. Significant residential expansion in this direction did not start until the mid-1950s (Lagos State Handbook,1988), when many new arrivals settled in the area. Other groups of people from Lagos municipality started moving into the villages of Ajegunle, Ajeromi and Ayetoro. The activities of the private developers quickened the expansion in this direction. On account of the strategic position of the area and of its economic prospects, such private developers hurriedly put up houses which in most cases are of poor standard and lack the necessary internal amenities. As a result, cheap tenements were provided to meet the need of the residents who in most cases were poor. The predominant ethnic group in the area is the Ibo.

The planned area of Surulere which is to the west of Yaba took off with the activities of the Lagos Executive Development Board (LEDB), who in the late 1950s initiated schemes aimed at accommodating displaced families from the slum clearance area of central Lagos, re-housing refugees from a fire disaster in central Lagos and providing low cost

housing for the low income workers. This pattern of settlement is another example of other determining factors other than economic forces. Yet another section of Surulere, the Itire road estates was for freehold development. Differences have therefore arisen in the housing conditions of the two areas. In the former, the houses are mostly bungalows equipped with the necessary indoor amenities, whilst in the latter area, the houses are mostly two-storey buildings (see Table 4.15). The population in this latter area is mixed in terms of the occupation of residents, though consisting largely of people with high economic status (see Tables 4.13). The ethnic composition of Surulere is fairly heterogeneous but the main group consists of the Yoruba.

The development of its north-eastern side, that is Ojuelegba, started after the second World War through the activities of private developers. This section lacks adequate planning, hence the haphazard manner of its layout. Its housing density is relatively high compared with the planned area of Surulere.

Areas of recent development are Mushin, Somolu, Bariga, Ogudu and Ikeja (see Figure 3.4). Mushin, Somolu and Bariga areas due north of Surulere and Yaba respectively exhibit poor residential conditions. This has resulted from the acquisitive nature of private developers. And the population of these

areas have increased astronomically. Most of the increase is derived from net migration. After the opening up of the Lagos-Abeokuta road and the Lagos-Ikorodu road, migration from the two named directions took a new turn, with the result that many of the new entrants prefer settling down at this northern periphery of the metropolis where rooms could be secured at cheaper rates. In order to catch up with the increased demand, many of the houses were poorly designed and lacked essential indoor amenities. However, there are pockets of high quality residential areas, notable among which are the low density areas of Palm Grove Estate, Ajao Estate, Maryland, Gbagada Estate, Ogudu G.R.A. and Ilupeju.

Another area of direct rapid development is Ikeja which is due north of the metropolitan. Its development has resulted from the activities of both private and public developers. The location of a Government Reservation Area (GRA) in Ikeja in the 1930s, and the establishment of the Maryland estate in the early 1960s gave the initial stimuli to the development of the area. However, the main force in the expansion of Ikeja into an important residential area is the establishment of the Ikeja Industrial estate in the late 1950s. A housing estate scheme was also started by the Western Nigeria Housing Corporation (now controlled by Lagos State Development and Housing Corporation) in its objective of housing low income

industrial workers. The scheme made for a better planned neighbourhood that is supplied with modern amenities. Housing density is however high. Of recent, private developers are actively engaged in erecting more houses in Ikeja to meet the increasing demand arising from the rapid rate of growth of the metropolis' population.

Agege area, which is to the northern most part of the city, has for a long time served as a cheap dormitory suburb for low income workers in Lagos. In recent years, it has become better linked with the city (even up to Ota in Ogun State) as the urban sprawl spreads in its direction. Other areas that have been opened up for residential purposes in the outskirts of the metropolis are Ojota to the east of Ikeja, Shogunle-Oshodi sections of Mushin, Coker an area north of Agege, Ogudu, Oworonshoki and Ketu all in Somolu local government (see Figure 3.4).

3.6 CONCLUSION

The chapter highlighted the significance and the role of housing in Metropolitan Lagos. It examined the spatial growth and the rapid development of housing in view of the economic and human ecological analyses of urban structures. It was noted that most of the figures contradict assumed rates of growth and projections by the Master Plan Unit of the Ministry

of Economic Development and Land Matters. Also, it was observed that the various zones constitute different neighbourhoods and distinct housing markets. However, the models helped in the explanation of the location behaviour of households and groups and offer valuable insights into city structure.

CHAPTER FOUR

THE SPATIAL STRUCTURE OF HOUSING IN LAGOS

4.1 INTRODUCTION

The quality of properties in an area usually determines the type of people living in the area and the location also confers some measure of value on the neighbourhood. Furthermore, the economic and human ecological analysis of urban structures provide a number of elements explaining the location behaviour of households and groups. This chapter therefore examines the structure of the characteristics of households as they vary with housing values in the different neighbourhoods and their effects and relevance to the Lagos housing market. We shall also test the hypothesis that house prices vary by location and neighbourhood in cities.

4.2 THE MEASUREMENT OF HOUSING VALUES

The measure of the housing values as the dependent variables are derived from the annual values of properties. All residential properties are treated with their rental values and this is consistent with Linneman's(1981) view that the annual value of all properties can be analysed from rental information. The measure of housing values used in this study is thus the annual housing rent obtained for all the surveyed properties by the Estate and Valuation office of the Lagos

State Government. In the valuation of the houses, all rooms in each property were multiplied by their annual rental values and this gave the gross value for each house. The measurement is used because it gives an unbiased and professional assessment of the properties especially as they were to be used for tenement ratings. Furthermore, they were carried out by independent private valuers and surveyors who did not own any allegiance to either the government or to the owners of the properties. Therefore, the problems always envisaged that - there is difficulty associated with obtaining property values in a developing country and that such data are unreliable (Dalton,1962; Ayeni,1979; and Megbolugbe,1986) may not be true.

Calculation of rental values were based on the annual house rent for the renters and the owners estimates of the annual housing value (which from the valuers professional point of view should be comparable with similar properties in the neighbourhood). In most cases, the owners were more current and conversant with the changes in the housing market because they sometimes sublet part of their housing units, own another property somewhere else or were used to the plight of the renters. The case of Lagos is even very interesting because no landlord ever undervalues his property because of the commercial nature of the metropolitan area. What makes the

annual rental value appropriate is that the assessment of all the houses were carried out throughout the state, thus eliminating the possibility of a bias towards this research.

Furthermore, in determining the independent variables that are appropriate for the explanation of housing values on smaller geograghical scale, many housing attributes were considered. The variables selected shown in tables 4.1 and 4.2 are the most important variables entered for the socio-economic analysis and other housing attributes (neighbourhood, locational aand structural). They have proved to be highly significant and highly correlated with housing values when regressed on stepwise basis. These variables include information on the number of rooms occupied by the household; number of persons in each household; area occupied by buildings; income of head of household; length of stay in the area; number of kitchen, toilet, and bathroom facilities; transport cost to place of work; and the distance to place of work.

4.3 VARIATION OF HOUSING VALUES

In examining the spatial variation among the neighbourhood and locational variables as they affect the housing values, different statistical techniques are employed. They vary from simple analysis of variance to

Table 4.1 Definition of Hedonic Housing Variables for Lagos Metropolitan Housing Market

Variable	Definition
STRUCTURAL	
AREA	Area Occupied by Buildings(m^2)
ROOMS	Size of Rooms(m^2)
NPERS	Number of Persons in the Household
NROOM	Number of Rooms Occupied by Household
KITCHEN	Number of Kitchen Facilities
TOILET	Number of Toilets
BATHS	Number of Bathroom Facilities
WATER	Provision of Pipe-borne Water = 1*
OPENS	Number of Open Space Provision
MAINT	If the House is well Maintained = 1*
HAPP	If Apperance of House is good = 1*
ELECT	If power supply is Electricity = 1*
ROOF	If roofing material is abestors = 1*
WALL	If wall is concrete = 1*
BUILD	If building/housing unit is shared = 1*
LOCATIONAL	
TCOSTSCH	Transport cost to children school (₦)
TSCH	Time spent from House to children school (Hour)
TCTREC	Transport cost to place of Recreation (₦)
HACCESS	Accessibility to the House is good = 1*
TWORK	Time spent to work place (Hour)
SCHDST	Distance to children school (km)
TCOST	Households Monthly Transport cost (₦)
TWORSH	Time spent to place of worship (Hour)
DWORSH	Distance to place of worship (km)
TCWORK	Transport cost to place of work (₦)
TSHOP	Time spent to place of shopping (Hour)
DRECK	Distance to place of Recreation (km)
TCWORSH	Transport cost to place of worship (₦)
PWORK	Distance to Area of Place of work (km)
TREC	Time spent to place of recreation (Hour)
TCSHOP	Transport cost to place of shopping (₦)
DWORK	Distance to place of work (km)
DSHOP	Distance to place of shopping (km)

Variable	Definition
NEIGHBOURHOOD	
LAREA	Length of stay of Household Head in the Area (Years)
LHOUSE	Length of stay in the House (Years)
RCOST	Cost paid on Refuse collection (₦)
PUBHOSP	Number of public Hospital/Health centres in the Neighbourhood
NACCESS	Number of markets/shopping centres in the Neighbourhood
PTRANS	Availability of Public Transport = 1*
WASTES	Number of waste disposal system in the Neighbourhood
CRIME	Neighbourhood crime Rate is high = 1*
SECSCH	Number of secondary school in the Neighbourhood
EMPLOY	Neighbourhood known for Employment opportunity = 1*
POLICE	Number of Police station in the neighbourhood
FLOOD	Neighbourhood prone to flooding = 1*
POLLUT	Neighbourhood pollution level is High = 1*
REPUT	Neighbourhood reputation is Good = 1*
REFUSE	Number of Refuse/Garbage collection for week
PRISCH	Number of Primary school in the Neighbourhood
SECURE	Neighbourhood security is good = 1*
PARK	Number of parking facilities provided in the Neighbourhood
PCLINIC	Number of Private Clinic in the Neighbourhood
NOISE	Neighbourhood noise level is high = 1*
PLAY	Number of children playground in the Neighbourhood
RECREAT	Number of Recreational facilities in the Neighbourhood
NAPP	Neighbourhood Appearance is good = 1*
ROAD	If the Neighbourhood Road is Tarred = 1*
PEOPLE	If Household Head is of Senior Level Officer = 1*
HRENT	Annual House Rental values (₦)

* Otherwise equals zero

Table 4.2 Definition and Summary Statistics of Hedonic Housing Variables for Metropolitan Lagos

Variable	Definition	Mean	S.D
AREA	Area Occupied by Buildings (m^2)	963.9	637.6
ROOMS	Size of Rooms (m^2)	2.4	0.7
NPERS	Number of Persons in the Household	6.1	2.5
NROOM	Number of Rooms occupied by Household	3.3	1.3
KITCHEN	Number of Kitchen Facilities	2.9	0.9
TOILET	Number of Toilet Facilities	2.9	0.9
BATHS	Number of Bathroom Facility	2.9	0.9
WATER	Provision of Pipe-borne water= 1*	0.8	0.5
BUILD	If Building/Housing Unit is shared = 1*	0.7	0.4
OPENS	Number of Open Space Provision	0.4	0.2
HAPP	If Appearance of House is Good= 1*	0.7	0.4
INCOME	Yearly Income of Household Head (₦)	5/526.5	16974.0
EDUCQ	Number of Years spent by Household Head in School	9.2	4.8
AGE	Age of Household head	51.1	14.6
HRENT	Annual House Rental Value (₦)	39836.3	18329.7
LAREA	Length of stay of Household Head in the Area (Year)	16.7	4.9
LHOUSE	Length of stay of in the House (Years)	19.7	9.2
TCOST	Households Monthly Transport cost (₦)	1713.0	709.0
MAINT	If the House is well Maintained = 1*	0.8	0.5
PARK	Number of Parking Facilities	3.4	0.9
PLAY	Number of children Playground	3.5	0.8
DWORK	Distance to place of work (km)	2.6	1.1
WASTES	Number of waste disposal system	3.3	0.8
RECREAT	Number of Recreational Facilities	1.2	0.9
TCWORK	Transport cost to place of work(₦)	1736.0	827.0
SECSCH	Number of Secondary School in the Neighbourhood	2.2	0.8
TCOSTSCH	Transport cost to children School (₦)	1180.0	754.0
TWORK	Time spent to work place (Hour)	1.9	0.7
NOISE	Neighbourhood Noise Level is High = 1*	0.6	0.4
PEOPLE	If Household Head is of Senior Level Officer = 1*	0.6	0.4

* Otherwise equals zero

multiple regression analysis. In an investigation to throw light on the nature of the spatial variations on the locational and neighbourhood attributes, the set of descriptive statistics of means and standard deviations were used and the analysis of variance describe the dimensions of variation in these housing attributes. In the analysis here, the spatial variations were examined through frequencies and mean deviations over 53 zones in the metropolitan Lagos.

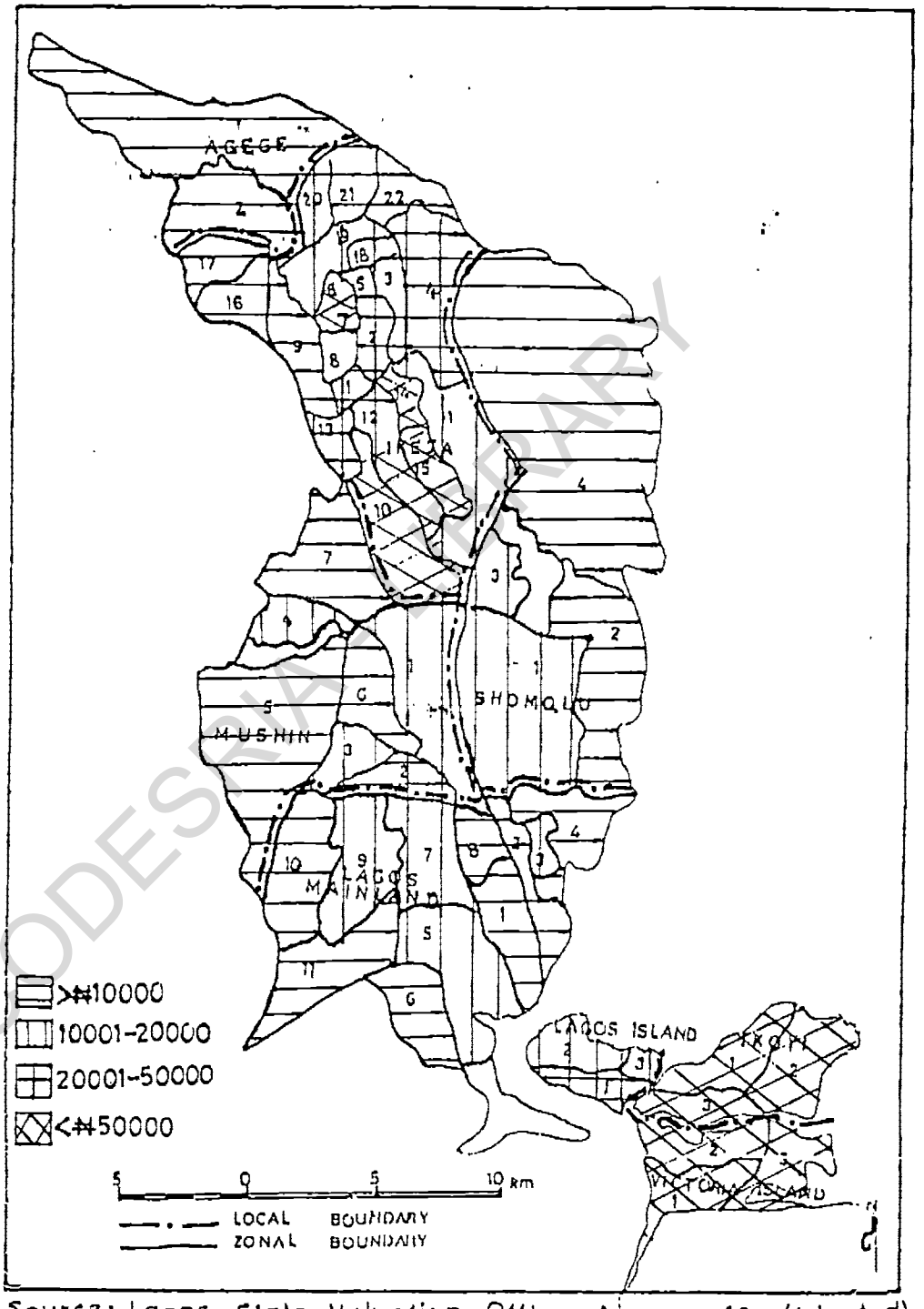
One of the most important variables to identify the housing values in different neighbourhoods is the rental value. The quantity of properties, the basic amenities and their location confers some measure of value on the neighbourhood. That is why some people, while considering their status socially and economically will always prefer specific neighbourhoods, no matter the cost. Table 4.3 and figures 4.1 show the zonal variation and pattern of average house rental values in metropolitan Lagos. The average annual rent per household is N39,836.30. On neighbourhood basis, table 5.5b shows that 100 percent of the surveyed residential buildings in Lagos Island (zones 1-3), Lagos Mainland (zones 10-21), Somolu (zones 21-24), Mushin (zones 25-31), Agege (zones 50-53) and 78.3 percent in Ikeja (zones 32-49) would not go more than N50,000 yearly. These neighbourhoods are where the rooming houses are very common with single rooms

Table 4.3 Mean Values of Neighbourhood Variables in Metropolitan Lagos

Zone	HRENT		AREA	
	Mean	S.D	Mean	S.D
1	256770.6	15874.0	479.0	517.2
2	14337.5	13231.3	155.0	64.9
3	13700.0	8967.2	170.0	80.0
4	118000.0	27503.3	4016.4	1094.9
5	188000.0	84193.7	4461.4	2096.1
6	116250.0	115209.8	1360.8	1765.0
7	255000.0	76217.4	1481.0	168.0
8	292500.0	142709.2	2525.5	404.3
9	250000.0	152255.8	1735.3	287.9
10	8528.0	4559.6	238.5	100.5
11	4094.5	2265.0	296.2	140.8
12	17496.0	7807.1	464.0	121.2
13	7332.5	2852.9	317.9	101.8
14	13231.4	6530.5	398.6	74.6
15	9177.8	5150.2	312.7	107.2
16	16247.4	10912.8	658.9	1012.8
17	8300.0	2834.0	376.0	110.1
18	15133.9	8071.1	439.1	178.0
19	8375.0	4721.3	473.7	133.7
20	9000.0	4925.5	481.3	222.5
21	13500.0	6873.2	450.4	63.8
22	7320.0	7177.7	429.7	144.5
23	15040.0	7261.0	748.8	212.7
24	7766.7	5138.6	364.6	122.6
25	10318.2	7075.8	513.6	322.5
26	9461.5	2713.0	463.1	144.0
27	12000.0	5063.2	446.6	157.4
28	17888.9	11994.7	608.0	173.9
29	9364.6	5447.6	528.6	207.4
30	8500.0	4062.0	381.7	72.9
31	9055.6	4823.0	417.6	65.2
32	27250.0	14404.1	520.3	89.6
33	50000.0	21908.9	1247.0	191.7
34	27500.0	2738.6	1293.5	270.0
35	27500.0	13693.1	531.5	135.3
36	52500.0	2738.6	2100.5	225.1
37	32500.0	8215.8	750.0	305.6
38	8000.0	2190.9	366.0	6.6

Zone	HRBNT		AREA	
	Mean	S.D	Mean	S.D
39	53750.0	13505.1	2250.8	879.3
40	19250.0	6353.7	608.9	178.6
41	30500.0	12391.3	5800.0	945.8
42	30500.0	15612.5	1025.3	670.1
43	196000.0	101334.0	626.2	169.5
44	71250.0	44062.2	905.3	341.3
45	16666.7	6614.4	747.7	209.6
46	20000.0	5477.2	611.5	20.3
47	17666.7	11821.6	2616.7	3294.0
48	7000.0	1954.0	638.3	202.5
49	9000.0	4843.0	717.5	656.2
50	6333.3	1794.4	376.7	76.0
51	6658.3	3855.5	424.3	131.2
52	7357.1	9530.0	406.6	171.1
53	5000.0	1549.2	325.7	125.8
Total Sample	39836.3	18329.7	963.9	637.6

FIG. 4.1 MAP OF METROPOLITAN LAGOS SHOWING THE ANNUAL HOUSE VALUES IN THE ZONES



Source: Lagos State Valuation Office, Alausa, 1993(Adapted)

being rented between N100 and N200 monthly. In Victoria Island (zones 7-9) and Ikoyi (zones 4-6), 100 percent of the owners would charge over N51,000 as rent yearly, while 21.7 percent of the buildings in Ikeja would go for the same rent yearly. However, it should be noted that the quoted rental values were based on the survey carried out in 1991 by the valuation department of Lagos State Government. Since that time, the prices of goods including rental charges have gone up tremendously and some adjustments are being made in relation to recent realities.

The type of people living in the area is another important variable in the spatial variation of neighbourhoods. Tables 4.4a&b show the variation in the different neighbourhoods of the Metropolitan Lagos. While there are pockets of business executives (10.7%), Senior civil servants (17.9%) and Diplomats (3.6%) in Lagos Islands (zones 1-3), majority of the residents in the neighbourhood are medium/low income earners (67.8%). Lagos Mainland (zones 10-20), Somolu (zones 21-24), Mushin (zones25-31) and Agege (zones 50-53) further confirmed that the areas are not inhabited by Diplomats as the response of the residents show zero percentage. A look at Victoria Island (zones 7-9), Ikoyi (zones 4-6) and Ikeja (zones 32-49) show that majority of the residents (100%, 85.7% and 61.6% respectively) are either

Table 4.4a Type of People Living in the Area (Zones)

Zone	Diplomats		Business Executive		Senior civil Servants		Middle Level Officers		Low Income Earners	
	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%
1	3	8.6	7	20.0	10	28.6	8	22.9	7	20.0
2	-	-	2	5.7	4	11.4	14	40.0	15	42.9
3	-	-	-	-	1	7.1	5	35.7	8	57.1
4	-	-	5	50.0	5	50.0	-	-	-	-
5	3	23.1	2	15.4	8	61.5	-	-	-	-
6	3	15.9	7	36.8	3	15.9	4	21.1	2	10.5
7	3	23.1	6	46.2	4	30.8	-	-	-	-
8	6	42.9	6	42.9	2	14.3	-	-	-	-
9	1	11.1	6	66.1	2	22.2	-	-	-	-
10	-	-	3	11.6	6	23.1	7	26.9	10	38.5
11	-	-	3	12.0	5	20.0	7	28.0	10	40.0
12	-	-	2	10.5	4	21.1	5	26.3	8	42.1
13	-	-	6	13.3	12	26.1	12	26.7	15	33.3
14	-	-	4	12.9	8	25.8	8	25.8	11	35.5
15	-	-	2	9.5	4	19.1	6	28.6	9	42.9
16	-	-	7	16.7	13	31.0	11	26.2	11	26.2
17	-	-	3	12.0	5	20.0	7	28.0	10	40.0
18	-	-	4	12.9	8	25.8	8	25.8	11	35.5
19	-	-	6	13.3	12	26.7	12	26.7	15	33.3
20	-	-	5	18.5	5	18.5	7	25.9	10	37.0
21	-	-	9	12.2	15	20.3	20	27.0	30	40.5
22	-	-	6	7.3	8	9.8	27	32.9	41	50.0
23	-	-	11	26.8	10	24.4	10	24.4	10	24.4
24	-	-	7	7.7	15	16.5	27	29.7	42	46.2
25	-	-	2	4.0	10	20.0	13	26.0	25	50.0
26	-	-	-	-	5	13.5	10	27.0	22	59.5
27	-	-	-	-	6	15.8	9	23.7	23	60.5
28	-	-	3	7.5	9	22.5	10	25.0	18	45.0
29	-	-	1	2.3	7	16.3	11	25.6	25	58.1
30	-	-	1	2.8	6	16.7	9	25.0	20	55.6
31	-	-	-	-	5	13.5	10	27.0	22	59.5
32	-	-	3	23.1	4	30.8	3	23.1	3	23.1
33	-	-	4	23.5	5	29.4	4	28.5	4	23.5
34	-	-	2	22.2	3	33.3	2	22.2	2	22.2
35	-	-	3	16.7	4	22.2	7	39.9	4	22.2
36	-	-	5	23.8	6	28.6	5	23.8	5	23.8
37	-	-	6	25.0	7	29.2	6	20.0	5	20.8
38	-	-	4	23.5	5	29.4	4	23.5	4	23.5

Zone	Diplomats		Business Executive		Senior civil Servants		Middle Level Officers		Low Income Earners	
	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%
39	-	-	4	20	5	25.0	4	20.0	7	35.0
40	-	-	7	26.7	8	30.8	7	26.9	4	15.4
41	-	-	4	25.0	5	31.3	4	25.0	3	18.8
42	-	-	8	33.3	9	37.5	3	12.5	4	16.7
43	-	-	8	29.6	9	33.3	6	22.2	4	14.8
44	-	-	3	15.0	4	20.0	6	30.0	7	35.0
45	-	-	3	16.7	4	22.2	3	16.7	8	44.4
46	-	-	2	13.3	3	20.0	1	6.7	9	60.0
47	-	-	1	6.25	2	12.5	1	6.25	12	75.0
48	-	-	1	7.1	2	14.3	1	7.1	10	71.4
49	-	-	1	7.1	2	14.3	1	7.1	10	71.4
50	-	-	3	7.7	6	15.4	10	25.6	20	51.3
51	-	-	3	5.6	6	11.1	10	18.5	35	64.8
52	-	-	2	4.7	6	13.9	10	23.3	25	58.1
53	-	-	1	3.6	3	10.7	9	32.1	15	53.6

Table 4.4b TYPE OF PEOPLE LIVING IN THE AREA

	Lagos Island	Ikoyi	Victoria Island	Lagos Main land	Somolu	Mushin	Ikeja	Agege	Total
	Freq %	Freq %	Freq %	Freq %	Freq %	Freq %	Freq %	Freq %	Freq %
Diplomats	3	6	10	-	-	-	-	-	19
	3.6	14.3	27.8	-	-	-	-	-	1.4
Business Executives	9	14	18	45	33	7	69	9	204
	10.7	33.3	50	13.4	11.5	9.6	38.3	5.6	14.5
Senior Civil	15	16	8	81	48	48	42	21	279
Servants	17.9	38.1	22.2	24.1	16.7	17	23.3	13	19.8
Middle Level	27	4	-	90	84	72	45	39	361
Officers	32.1	9.5	-	26.8	29.2	25.5	25.0	24.1	25.6
Low Income Earners	30	2	-	120	123	135	24	93	527
	35.7	4.8	-	35.7	42.7	47.9	13.3	57.4	37.4
Total	84	42	36	336	288	282	180	162	1410
	100	100	100	100	100	100	100	100	100

Business Executives/ Senior Civil Servants or Diplomats. In Victoria Island, there are more of the Diplomats as it recorded 27.8 percent as against 14.3 percent in Ikoyi. Also, 50 percent of the residents in Victoria Island are believed to be Business Executives while the Senior Civil Servants are more in Ikoyi with 38.1 percent. Ikeja, however, has the mixture of all but with the Business Executives leading (38.3%) followed by Middle Level Officers (25%), Senior Civil Servants (23.3%) and Low Income Earners (13.3%).

The cost of land in the high income areas, especially Ikoyi, Victoria Island, Lekki Peninsula are in millions while the rental values in these areas are in tens of thousands per month, there is no doubt that they are exclusive areas for the highly rich people. An observation revealed that most of the tenants in these areas have their properties either rented and paid for by the government (state or federal) or their companies. No worker except the foreigners would have ventured to spend over half a million naira on rent. Another observation is the invasion of these highly planned residential areas by commercial activities and financial institutions. This has increased the land values of the areas astronomically.

The area of land occupied is also important in explaining characteristics of neighbourhood. While land is no doubt an

expensive commodity in housing production, Lagos brings out the issue clearly as it is the most expensive state in Nigeria. The zonal variation of average area of land occupied by the surveyed houses is shown in tables 4.3a&c. Table 4.3a shows that the average area of land occupied per household is 963.9m^2. On neighbourhood basis, table 4.3c shows that 92.8 percent of the buildings in Lagos Island (zones 1-3) are less than 500m^2 in size, 98.1 percent in Lagos Mainland (zones 10-20), 95.8 percent in Somolu (zones 21-24), 91.6 percent in Mushin (zones 25-31) and 88.9 percent in Agege (zones 50-53). Other neighbourhoods like Ikoyi-zones 4-6 (71.5%), Victoria Island-zones 7-9 (91.7%) and Ikeja-zones 32-49 (58.4%) have most of the population occupying over 1000m^2. The houses in these specific neighbourhoods (Ikoyi-zones 1&2, Victoria Island- zone 3, Ikeja- zones 2,8,12&13, Surulere G.R.A.(Mainland) zone 7, Ajao Estate (Mushin) zone 4, Anthony Village (Somolu) zone 3, Gbagada Estate (Somolu) zone 1, Ilupeju G.R.A (Mushin) zone 1) occupied large areas of land with superb buildings (Duplexes, Bungalows and Flats), large number of rooms and few number of households. These areas are provided with other basic amenities like schools, shopping centres, water, electricity and quality toilets, bathrooms and kitchen facilities.

In general, some facilities in the study area are well

provided and very common in almost all the neighbourhoods. They include private clinics, shopping centres/local shops, nursery/primary schools and secondary schools. No matter where you are, one does not need to travel to the central business district for his/her needs except for specialized goods like electronics and high quality textiles and jeweleries.

4.3a Rental Values and Housing Attributes

While the last section shows variation of house values in different areas of Lagos, it did not provide explanation for these variations. In this section we shall provide explanation for the variation using statistics methods of analysis of variance and multiple regression.

The analysis of variance of house rental values by all the housing attributes shows that the F ratio is 388.6048 and the observed F probability is 0.0000.

Variable V32 HOUSE RENTAL CHARGES

By variable V1 AREA

Analysis of Variance

Source	D.F	Sum of squares	Mean squares	F Ratio	F Prob.
Between Groups	7	553.3665	79.0524	388.6043	0.0000
Within Groups	1402	285.2037	0.2034		
Total	1409	838.3702			

That is, the variation between group means is significant and is too large to be attributable to chance. There are zonal variations in house rental values in all the different locations and neighbourhoods. The results show variability both within groups and between groups. That is, there is variation within neighbourhoods as well as between the neighbourhoods. In examining other variables on location and neighbourhood basis, the overall analysis on them show that they all have significant variations except the access to shopping centres (see Appendix 3).

In the regression equations, the functional form adopted is the linear model in which all the attributes were measured using the multiple regression model. The model was also used to test for market segmentation. The use of non linear models (log and semi log models) were found through the test runs not to contribute much in terms of the explanation of the model. Many researchers (Borukhov et al.,1978; Linneman,1981; Nelson,1981; Robert and Henry,1983; Bajic,1983; Robin and Goodman,1978) have used the hedonic technic to try to determine the implicit marginal prices for certain housing attributes, and a linear regression was used. Borukhov et al. (1978) in the study of housing market and preferences in Israel found that homeowners place great emphasis on good neighbourhoods, condition of building exterior, a small number

of dwelling units in the apartment, and a great number of rooms for a given floor space. Linneman (1981) used the linear model on the demand for residence site characteristics where the results show linear model has the best fit.

Furthermore, in order to determine that the variables employed in the analysis of the regression estimates are unaffected by multicollinearity, the zero order correlation matrix is used as presented in Table 4.5. The table 4.5 shows that we do not have pairwise correlations in excess of 0.80 among the independent variables as noted by Hauser's (1974) criterion.

In the explanation of the contributions and the spatial variation of housing values by neighbourhood attributes, ten predictor variables were selected on stepwise regression. They are the length of stay in the house (LHOUSE), length of stay in the area (LAREA), number of parking facilities in the neighbourhood (PARK), number of secondary schools in the neighbourhood (SECSCH), number of wastes collection centres in the neighbourhood (WASTES), number of recreational facilities (RECREAT), if noise level is high (NOISE), and the type of people in the neighbourhood (PEOPLE). The dependent variable is the housing values or house rental values. The correlation coefficient of the total sample of households of 1410 as shown in table 4.6 is 0.749. This is found to be highly significant

Table 4.5 Zero order Correlation Coefficient Matrix for Housing Attributes

HRENT	1.00											
INCOME	0.48	1.00										
NROOM	0.57	0.39	1.00									
DWORK	0.10	0.40	0.48	1.00								
PEOPLE	-0.35	-0.07	0.08	0.64	1.00							
AREA	0.41	0.66	0.61	0.30	-0.12	1.00						
EDUCQ	0.54	0.30	0.39	0.56	0.18	0.56	1.00					
NPERS	0.22	0.54	0.56	0.63	0.44	0.38	0.59	1.00				
BUILD	-0.09	0.18	0.22	0.53	0.64	0.01	0.39	0.46	1.00			
ROOMS	-0.23	-0.08	-0.00	0.38	0.52	-0.07	0.10	0.30	0.39	1.00		
TAREC	0.48	0.42	0.38	0.45	0.16	0.54	0.73	0.54	0.31	0.08	1.00	
TCOST	0.27	0.57	0.59	0.66	0.43	0.37	0.57	0.69	0.46	0.26	0.59	1.00

Table 4.6 The Analysis of Neighbourhood Attributes of Housing in Metropolitan Lagos

	Submarket 1		Submarket 2		Submarket 3		Total Sample	
	Beta	t-value	Beta	t-value	Beta	t-value	Beta	t-value
LHOUSE	-0.086	-1.813	0.239	6.392	0.180	2.946	0.217	8.477
LAREA	-0.186	-4.451	0.368	8.969	0.282	4.605	0.276	10.668
PARK	-0.427	-4.937	-0.047	-1.363	-0.145	-3.009	-0.150	-5.502
SECSCH	0.018	0.329*	0.072	2.403	0.113	2.484	0.157	6.924
NOISE	-0.370	-6.123	-0.145	-3.853	-0.276	-4.770	-0.125	-4.526
ROAD	0.230	4.818	-0.110	-2.890	0.089	1.752	0.115	4.174
WASTES	0.149	2.822	0.089	-2.852	-0.036	0.811	-0.044	-1.834
RECREAT	0.266	3.615	0.165	4.111	-0.142	-2.671	0.010	0.346
PEOPLE	-0.576	-10.405	0.121	2.763	-0.117	-1.543	-0.382	-11.904
REPUT	0.028	0.482*	0.008	0.260*	-0.187	-3.553	-0.119	-4.701
Constant	4.465	9.591	0.640	6.268	2.506	15.963	2.049	18.050
Multiple R	0.870		0.664		0.703		0.749	
R Square	0.758		0.441		0.494		0.562	
F-ratio	47.175		40.781		28.366		79.234	
N	164		800		446		1410	

* Coefficient not significant at 95 percent confidence level

at 0.05 level and this means that the correlation between the criterion and predictor variables is not a chance occurence. Also, the R^2 value of 0.56 implies that the variables explain only 56 percent of the total variation of housing values. The analysis of variance value of F = 56.885 confirms the significance of all the variables at 95% confidence level. Some of the significant neighbourhood attributes were discussed in earlier sections (see Tables 4.3 and 4.6) and others will be explained along with the socio-economic attributes in the next section.

4.4 HOUSING VALUES AND LOCATIONAL ATTRIBUTES

Location refers to the specific placement of a house which affects housing choices. A home is part of a neigbourhood and should be viewed in the community setting. Each occupant has needs which must be met in the larger community. Facilities for education, transport, worship, health care, shopping and recreation are factors to be considered when making housing choices. Location choices also range from urban to suburban to rural. A home that takes advantage of its surroundings reflects the character of the area. For homes should always fit their surroundings. Location is thus an important consideration in the design and construction of a home. The materials used to build the

structure as well as the furnishings used to decorate the interior can be affected by the location.

Many locational attributes were considered in this research (see Table 4.1). They include : location and access to market, location of workplace, distance of house to place of work, children's school, place of shopping, place of recreation and worship, amount paid on transport from home to area of activities (place of work, children's school, recreation and worship), time spent from home to area of activities. The choice of the above variables was based on their importance to the explanation of locational effects on house values. Previous studies (Kain, 1962; Blomquist and Worley, 1981; Nelson, 1978; Linneman, 1981; Casetti and Can, 1986; Can, 1989; Arimah, 1990; and Casetti and Can, 1990) have used some of the variables. Also, the concentration of workers in the CBD is no more important as there are multiple-nuclei centres in Metropolitan Lagos.

The importance of each of the attributes is very essential for the selection of a house. The location of the market and accessibility to it sometimes play a decisive role in household choice of a house. The location of workplace is the most important factor when deciding to live in a place since this factor determines and affects a lot of things, this is shown in tables 4.7a & b. The location of workplace was

examined along with the distance to the house (Table 4.8) and this has its effect on the time spent and the amount paid on transportation.

The locations of workplace of respondents to their homes is shown in tables 4.7a&b. Majority of the people living in Lagos Island still work on the Island (64.3%). This could be due to the commercial nature of the area. Other neighbourhoods residents recorded low percentages as those commuting daily with Lagos Island (Lagos Mainland-zones 10-20 (18.8%), Somolu-zones 21-24 (19.8%), Ikoyi-zones 4-6 (28.6%), Victoria Island-zones 7-9 (33.3%), Mushin-zones 25-31 (14.9%), Ikeja-zones 32-49 (18.3%) and Agege-zones 50-53 (18.5%)). The highest percentages of residents still work within their neighbourhoods. For instance, 51 percent of the residents of Ikeja work in the neighbourhood, 30 percent of the households in Lagos Mainland work in Mainland, and 54 percent of those in Lagos Island work in Lagos Island (see Table 4.7b). All the same people still move from far and near to the Central Business District of Lagos. Other areas of importance is the industrial and other regional business centres which actually are scattered everywhere within the Metropolitan Lagos. The highest place of concentration of industries however is Apapa in Lagos Mainland and the total percentage of people who work in the area is the highest with 27 percent.

Table 4.7 Area of Place of Work

Zone	Lagos Island		Ikoyi		V.I		Lagos Mainland		Somolu		Mushin		Ikeja		Agege	
	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%
1	30	71.4	6	14.3	3	7.1	3	7.1	-	-	-	-	-	-	-	-
2	15	62.5	3	12.5	-	-	-	-	6	25.0	-	-	-	-	-	-
3	15	71.4	3	14.5	-	-	-	-	-	-	-	-	3	14.3	-	-
4	3	20.0	3	20.0	3	20.0	3	20.0	3	20.0	-	-	-	-	-	-
5	3	20.0	6	40.0	3	20.0	3	20.0	-	-	-	-	-	-	-	-
6	6	50.0	3	25.0	3	25.0	-	-	-	-	-	-	-	-	-	-
7	3	25.0	3	25.0	3	25.0	3	25.0	-	-	-	-	-	-	-	-
8	3	25.0	3	25.0	3	25.0	3	25.0	-	-	-	-	-	-	-	-
9	6	50	-	-	6	50.0	-	-	-	-	-	-	-	-	-	-
10	9	33.3	6	22.2	-	-	12	44.4	-	-	-	-	-	-	-	-
11	6	18.2	6	18.2	3	9.1	12	36.4	3	9.1	-	-	3	9.1	-	-
12	-	-	-	-	-	-	12	80.0	3	20.0	-	-	-	-	-	-
13	3	16.7	3	16.7	-	-	9	50.0	3	16.7	-	-	-	-	-	-
14	6	22.2	6	22.2	-	-	9	33.3	-	-	-	-	-	-	6	22.2
15	6	25.0	3	12.5	3	12.5	9	37.5	3	12.5	-	-	-	-	-	-
16	6	10.5	9	12.8	6	10.5	12	21.1	6	10.5	6	10.5	9	12.8	3	5.3
17	6	40.0	3	20.0	-	-	3	20.0	-	-	3	20.0	-	-	-	-
18	6	11.1	9	16.7	6	11.1	9	16.7	6	11.1	6	11.1	9	16.7	3	5.6
19	12	33.3	6	16.7	3	8.3	6	16.7	3	8.3	6	16.7	-	-	-	-
20	3	12.5	3	12.5	3	12.5	6	25.0	3	12.5	6	25.0	-	-	-	-
21	12	15.4	9	11.5	9	11.5	18	23.1	6	7.7	6	7.7	15	19.2	3	3.9
22	18	17.1	15	14.3	12	11.4	33	31.4	6	5.7	3	2.9	15	19.3	3	2.9
23	3	20.0	3	20.0	3	20.0	3	20.0	-	-	-	-	3	20.0	-	-
24	24	26.7	15	16.7	6	6.6	3	3.3	15	16.7	6	6.7	21	23.3	-	-
25	6	9.1	12	18.2	-	-	6	9.1	12	18.2	12	18.2	18	27.3	-	-
26	12	30.8	3	7.7	-	-	3	7.7	3	7.7	6	15.4	12	30.3	-	-
27	3	6.7	3	6.7	-	-	15	33.3	3	6.7	9	20.0	12	26.7	-	-
28	3	11.1	3	11.1	3	16.1	3	18.2	6	11.1	6	22.2	3	11.1	3	11.1
29	6	18.2	3	9.1	--	--	6	16.7	3	18.2	6	18.2	6	18.2	-	-
30	3	16.7	3	16.7	3	5.3	3	21.1	9	16.7	3	16.7	3	16.7	-	-
31	9	15.8	6	10.5			12			15.8	6	10.5	9	15.8	3	5.3
32	3	25.0	3	25.0	-	-	-	-	-	-	-	-	6	50.0	-	-
33	-	-	3-	50.0	-	-	-	-	-	-	-	-	3	50.0	-	-
34	3	50.0	-	-	3	50.0	-	-	-	-	-	-	-	-	-	-
35	3	50.0	-	-	-	-	-	-	-	-	-	-	3	50.0	-	-
36	3	50.0	-	-	3	50.0	-	-	-	-	-	-	-	-	-	-
37	3	50.0	-	-	-	-	-	-	-	-	-	-	3	50.0	-	-
38	-	-	3	-	3	50.0	3	50.0	-	-	-	-	-	-	-	-
39	3	25.0	3	25.0	3	25.0	-	-	-	-	-	-	3	25.0	-	-
40	3	12.5		12.5	-	-	3	12.5	6	25.0	-	-	6	25.0	3	12.5

Zone	Lagos Island		Ikoyi		V.I		Lagos Mainland		Sonolu		Mushin		Ikeja		Agege	
	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%
41	-	-	3	25	3	25	-	-	-	-	-	-	6	50	-	-
42	3	33.3	3	12.5	3	33.3	-	-	-	-	-	-	-	-	-	-
43	3	20.0	3	25	3	20.0	3	20.0	-	-	-	-	3	20.0	-	-
44	3	25.0	3	33.3	3	25.0	-	-	-	-	-	-	3	25.0	-	-
45	-	-	-	20.0	3	39.3	3	33.3	-	-	-	-	3	33.3	-	-
46	-	-	3	25.0	-	-	-	-	-	-	-	-	3	50.0	-	-
47	-	-	-	-	-	-	3	33.3	-	-	-	-	3	33.3	3	33.3
48	-	-	-	50	-	-	3	25.0	3	25.0	-	-	3	25.0	3	25.0
49	3	25.0	-	-	-	-	3	25.0	3	25.0	-	-	3	25.0	-	25.0
50	6	22.2	-	-	-	-	6	22.2	3	11.1	6	22.2	6	22.2	-	-
51	15	20.8	3	2.8	3	2.8	9	8.3	9	8.3	6	8.3	12	16.7	15	20.8
52	6	14.3	3	7.1	-	-	6	14.3	6	14.3	6	14.3	9	21.4	6	14.3
53	3	14.3	-	-	-	-	3	14.3	3	14.3	3	14.3	6	28.6	3	14.3

Table 4.7b AREA OF PLACE OF WORK

	Lagos Island	Ikoyi	Victoria Island	Lagos Main land	Somolu	Mushin	Ikeja	Agege	Total
	Freq %	Freq %	Freq %	Freq %	Freq %	Freq %	Freq %	Freq %	Freq %
Lagos Island	54 64.5	12 28.6	12 33.3	63 18.8	57 19.8	42 14.9	33 18.3	30 18.5	225 16
Ikoyi	12 14.3	12 28.6	6 16.7	54 16.1	42 14.6	33 11.7	27 15	6 3.7	72 5.1
Victorial Island	3 3.6	9 21.4	12 33.3	24 7.1	30 10.4	6 2.1	24 13.3	3 1.9	30 2.1
Lagos Mainland	12 14.3	6 14.3	6 16.7	102 30.4	57 19.8	48 17	24	24 14.8	381
Somolu	- -	3 7.1	- -	30 8.9	27 9.4	36 12.8	13.3 12	21 13	27 291
Mushin	- -	- -	- -	27 8	15 5.2	48 17	6.7 -	21 13	20.6 204
Ikeja	3 3.6	- -	- -	21 6.3	54 18.8	63 22.3	- 51	33 20.4	14.5 126
Agege	- -	- -	- -	15 4.5	6 2.1	6 2.1	28.3 9	24 14.8	8.9 72
Total	84 100	42 100	36 100	336 100	288 100	282 100	5 180 100	162 100	5.1 1410 100

Source: Field Work, 1993

Table 4.8 Estimated Distances Moved Within Lagos Districts (in Kilo)

	Ikeja	Mushin	Somolu	Surulere	Yaba	Ebute-Meta	Apapa	Island	Ikoyi
Ikeja	-	5.92	7.34	8.88	10.30	12.87	15.19	17.25	18.67
Mushin	5.92	-	2.83	3.09	4.51	7.08	10.04	11.46	13.26
Somolu	7.34	2.83	-	3.99	3.86	6.44	10.04	10.56	11.59
Surulere	8.88	3.09	3.99	-	2.19	4.25	6.44	8.50	10.69
Yaba	10.30	4.51	3.86	2.19	-	2.70	6.44	6.95	8.75
Ebute-Meta	12.87	7.08	6.44	4.25	2.70	-	4.73	4.38	6.57
Apapa	15.19	10.04	10.04	6.44	6.44	4.73	-	5.66	9.12
Island	17.25	11.46	10.56	8.50	6.95	4.38	5.66	-	2.96
Ikoyi	18.67	13.26	11.59	10.69	8.75	6.57	9.12	2.96	-
Agege	3.75	9.66	10.88	12.62	14.05	16.61	18.47	20.86	21.89

Source: Calculated from Lagos S.E. Map Sheet 279, ed. 1994
Scale: 1.25 inches to 1.6 km

The respondents were asked why they chose to live in their present neighbourhoods. The reactions given vary over the neighbourhoods. While 60.7 percent of the residents in Lagos Island (zones 1-3) believed that it was because the houses were very close to their working places, 25 percent said the rent is affordable. 39 percent indicated that the environment is good and another 50 percent believed that they have no choice, being the place available to them due to the fact that the house is a family one inherited or because of scarcity of rooms to let. Other reasons given include those who were forced to resettle there because of its nearness to demolished shanty Maroko. A lot of people who earlier had properties in Maroko were forced to either live in nearby neighbourhoods or return to their villages /towns. Other neighbourhoods in tables 4.9a&b shared the same trend with Lagos Island in terms of rent affordability but with low percentage for the condition of the neighbourhood. A comparison with Ikoyi (zones 4-6), Victoria Island (zones 7-9), Ikeja (zones 32-49) and other specific neighbourhoods showed that good neighbourhood is of paramount importance for most residents. The availability of the house followed with 33.4 percent which is an indication that majority of the residents actually found themselves where they are either because it is the house their employers have already made

Table 4.9 Reasons for Living in Present House

Zone	Close to Work Place		Rent is Affordable		Good Environment		Available House		Others	
	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%
1	15	35.7	17	40.5	12	28.6	12	28.6	8	19.1
2	24	100.0	24	100.0	9	37.5	23	95.8	12	50.0
3	12	66.7	13	72.2	6	33.3	7	38.9	4	22.2
4	8	53.3	5	33.3	13	86.7	7	46.7	4	26.3
5	10	66.7	8	53.3	15	100.0	12	80.0	2	13.3
6	12	100.0	17	100.0	10	83.3	8	66.6	3	25.0
7	4	33.3	4	33.3	8	66.7	8	66.7	3	25.0
8	4	33.3	3	25.0	12	100.0	10	83.3	2	16.7
9	2	16.7	5	41.7	12	100.0	10	83.3	1	8.3
10	15	50.0	15	50.0	3	10.0	8	26.7	2	6.7
11	13	39.4	13	39.4	4	12.1	5	15.2	3	9.1
12	5	35.7	8	57.1	7	50.0	3	21.4	4	28.5
13	10	41.7	10	41.7	15	62	5	20.8	2	8.3
14	8	34.8	12	52.2	12	52.2	4	17.4	4	17.4
15	12	44.4	14	51.9	10	37.0	5	18.5	5	18.5
16	7	12.5	9	16.1	20	35.7	10	17.9	3	5.4
17	10	21.4	12	85.7	15	100.0	7	50.0	2	14.3
18	8	15.1	12	22.6	18	33.9	9	16.9	4	7.5
19	6	15.8	13	34.2	6	20.0	8	21.1	3	7.9
20	7	28.0	15	60.0	5	20.0	7	28.0	4	16.0
21	35	46.1	55	72.4	25	32.9	25	32.7	15	19.7
22	26	25.5	45	44.1	20	19.6	15	14.7	8	7.8
23	14	46.7	25	83.3	30	100.0	20	66.7	7	23.3
24	30	34.5	60	68.9	15	17.3	15	17.3	15	17.3
25	15	23.8	20	31.7	15	23.8	12	19.1	5	7.9
26	12	32.4	15	40.5	5	13.5	10	27.0	7	18.9
27	8	18.6	15	34.9	5	11.6	8	18.6	4	9.3
28	5	18.5	14	51.9	20	74.1	12	44.4	5	18.5
29	6	18.2	12	36.4	6	18.2	5	15.2	3	9.1
30	10	55.6	13	72.2	7	38.9	6	33.3	2	11.1
31	20	38.5	18	34.6	5	9.6	15	28.9	4	7.7
32	6	40.0	3	20.0	2	13.3	3	20.0	2	13.3
33	5	4.7	2	16.7	3	25.0	3	25.0	3	25.0
34	8	57.1	2	14.3	3	21.4	3	21.4	1	7.1
35	12	100.0	3	25.0	4	33.3	4	33.3	3	25.0
36	4	28.6	4	28.6	6	42.9	6	42.9	3	21.4
37	5	50.0	3	30.0	4	40.0	4	4.0	2	20.0
38	10	83.3	2	16.7	3	25.0	3	25.0	2	16.7

Zone	Close to Work Place		Rent is Affordable		Good Environment		Available House		Others	
	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%
39	12	80.0	5	33.3	5	33.3	5	33.3	3	20.0
40	6	30.0	4	20.0	4	20.0	4	20.0	5	25.0
41	8	57.1	3	21.4	3	21.4	3	21.4	4	28.6
42	9	75.0	3	25.0	4	33.3	4	33.3	3	25.0
43	12	75.0	2	12.5	5	31.3	5	31.3	4	25.0
44	10	66.7	2	13.5	6	40.0	6	40.0	5	33.3
45	5	35.7	3	21.4	3	21.4	3	21.4	2	14.3
46	7	70.0	3	30.0	2	20.0	2	20.0	3	30.0
37	6	50.0	4	33.3	3	25.0	3	25.0	2	16.7
48	8	53.3	6	40.0	4	26.7	4	26.7	1	6.7
49	6	40.0	4	26.7	2	13.3	3	20.0	2	13.3
50	8	36.6	20	90.1	16	72.7	16	72.7	8	36.4
51	10	14.5	42	60.9	20	29.0	19	27.5	7	10.1
52	6	15	35	87.5	12	30	12	30	8	20.0
53	12	50.0	20	83.3	24	100	23	95.1	4	16.7

available for them or due to scarcity of properties to rent. The idea that the rent is affordable looked normal, while the closeness to their working place is another factor.

4.5 HOUSING VALUES AND NEIGHBOURHOOD ATTRIBUTES

Neighbourhoods are geographic units within which certain social relationships exist, although the intensity of these relationships and their importance in the lives of residents vary tremendously (Downs 1981). Initially the neighbourhood unit was both a social and planning concept. On one hand, it had to provide convenience and comfort and direct, face-to-face contact in order to restore some sense of community that has been disturbed or destroyed by the specialization and segmentation of urban life. On the other hand, it was to constitute a special sub-part of a larger, more complex totality.

In the survey conducted for this research, the households were asked to assess some neighbourhood variables in order to evaluate the condition in their environments. Since defining a neighbourhood is to ask and know what the inhabitants think it is, some of the following neighbourhood variables were employed; length of stay of household head in the area (LAREA); flooding in your neighbourhood (FLOOD); cost of refuse collection (RCOST); the feeling/ level of security

(SECURE); incidence of crime (CRIME); the noise level (NOISE); number of markets/ shopping centres in the neighbourhood (NACCESS); number of waste disposal centres (WASTES); number of police stations in the neighbourhood (POLICE); number of children's playground in the neighhourhood (PLAY); number of recreational facilities in the neighhourhood (RECREAT); number of nursery and primary school in the neighbourhood (PRISCH); number of public hospital/ health centres (PUBHOSP) and number of private clinics (PCLINIC) in the neighbourhood (see Table 4.1). The chosen variables with their methods of measurement are representative and comparable to the earlier studies by Nelson (1978), Witte et al.(1979), Blomquist and Worley (1981), Linneman (1981), Follain et al.(1981), Megbolugbe (1983) and Arimah (1990).

The importance and purpose of the variables vary considerably. As much as possible the variables were measured by asking for specific units of provision of the neighbourhood facilities and a dummy variable is only used when measurement will result in error. Therefore, the idea that neighbourhood variables are problematic, intangible and difficult to measure objectively as observed by some researchers (Downs,1981; Li and Brown,1980; Arimah,1990) is not all that valid. We should know that some structural attributes are difficult to measure too. For example, electricity supply, wall, roof materials,

water supply, cracks in the wall are always measured as dummy variables. Therefore, one major improvement of this study over previous ones is that some of the neighbourhood attributes are calibrated/ measured to certain extent.

4.6 HOUSING VALUES AND SOCIO-ECONOMIC ATTRIBUTES

In an attempt to explain that households socio-economic variables vary with housing values in different locations and neighbourhoods and how housing values determined the households socio-economic variables, we first of all examine the degree to which the surveyed data tend to spread about an average value through the use of mean and the standard deviation. The purpose is to compare the variability of the variables over the 53 valuation zones. Later, the data is subjected to a more qualitative analysis through the use of multiple correlation analysis to explain the degree of the variation and relationship between the socio-economic variables and the house prices.

In the survey of the Lagos metropolitan area, a number of socio-economic variables were examined. They are; the age of the household heads, income of the household heads, number of rooms occupied by the household, number of persons in the household, education, length of stay in the house, occupation, type of buildings occupied by households, and the house tenure

(ownner occupier or rented). The last three variables (occupation, type of buildings and house tenure) were also analysed through the use of frequencies to describe the spatial variation of the sample size in the 53 valuation zones.

Table 4.10 shows that the mean age of the household heads was 51.1 years. This indicates that almost all the respondents were adults and in the working class who could speak authoritatively on behalf of their family members. The survey also shows in tables 4.12 that 63.4 percent were tenants and 36.6 percent were owner occupiers. However, there are variations across the zones except in Victoria Island (zones 7,8 and 9) where most of the occupiers were owner occupiers (66.7%). This could be due to the gigantic buildings that exist in the neighbourhood, especially in the newly acquired Victoria Annex (former Maroko) and Lekki Peninsula (all in zone 9) where only the owners could afford their rent. Some landlords who own properties in these high priced areas prefer to let them out for more income instead of living in them. They prefer to live in not too expensive areas except for those who have several other properties. The geographical implication of this is that some neighbourhoods have personal community attachment and that is why other essential infrastructural facilities are provided. In case of Ikoyi

Table 4.10 MEAN VALUES OF SOCIO-ECONOMIC SURVEY OF METROPOLITAN LAGOS (1)

Zone	AGE		LAREA		'LHOUSE	
	Mean	S.D	Mean	S.D	Mean	S.D
1	51.0	10.6	25.5	18.1	37.2	15.3
2	51.1	11.8	17.8	17.9	25.6	15.3
3	57.0	15.3	16.8	13.4	27.5	18.1
4	54.6	6.7	22.6	6.8	24.2	8.2
5	48.2	9.2	14.8	6.4	21.2	11.7
6	58.5	8.6	20.8	15.3	26.8	17.8
7	56.5	6.4	20.3	7.3	23.3	6.3
8	55.0	5.5	18.5	6.2	20.5	6.0
9	57.3	3.3	33.5	11.1	21.3	13.0
10	52.5	11.1	17.4	5.1	18.9	7.0
11	52.6	8.8	20.5	7.0	18.5	7.3
12	63.4	7.9	27.4	3.7	31.4	5.6
13	55.1	7.0	20.8	7.0	21.4	3.7
14	46.1	11.6	18.9	5.5	22.6	9.9
15	42.9	9.8	14.0	7.0	21.8	7.8
16	48.6	13.0	15.5	6.3	18.4	8.2
17	50.2	8.1	21.2	7.3	23.8	4.4
18	45.6	12.1	11.0	5.6	25.9	19.3
19	50.0	7.3	12.7	5.0	22.0	12.5
20	50.0	15.2	15.1	7.7	26.3	12.2
21	50.9	13.4	14.7	6.4	19.5	8.4
22	51.0	13.3	13.9	6.5	17.2	8.5
23	47.2	5.9	13.8	4.6	18.8	6.0
24	46.4	13.2	13.3	6.8	18.9	12.3
25	57.0	12.8	23.1	6.8	25.5	11.4
26	49.0	15.3	19.9	6.1	24.3	7.8
27	49.4	12.5	16.5	6.5	17.9	7.0
28	54.1	11.4	23.4	6.7	15.8	7.4
29	51.3	12.9	20.9	10.7	28.7	13.7
30	45.7	9.5	16.0	5.5	27.8	11.4
31	47.8	11.4	15.0	7.7	26.6	11.6
32	56.3	7.1	13.8	3.1	18.5	4.2
33	50.0	5.5	10.0	4.4	15.0	4.2
34	52.0	5.5	16.0	1.1	23.5	3.4
35	62.0	4.4	9.5	3.8	12.5	2.7
36	53.5	1.6	9.0	3.3	12.5	2.7
37	47.5	4.9	16.0	2.2	16.5	2.7

Zone	AGE		LAREA		'LHOUSE	
	Mean	S.D	Mean	S.D	Mean	S.D
38	54.0	1.1	19.0	6.6	23.0	9.9
39	57.3	7.5	19.0	4.1	21.8	7.7
40	51.5	9.0	16.5	9.0	18.3	9.3
41	53.8	6.4	14.5	4.7	9.0	4.1
42	43.3	8.7	19.3	7.6	12.3	4.4
43	51.8	7.3	9.4	3.3	11.0	5.4
44	54.8	10.1	9.8	5.3	10.8	5.5
45	53.0	8.7	8.7	4.4	12.3	4.9
46	49.0	5.5	10.5	2.8	5.0	2.2
47	42.0	8.7	14.0	3.5	7.7	4.4
48	47.3	11.6	12.5	3.8	9.0	5.5
49	49.0	11.7	11.0	5.9	10.0	5.6
50	57.6	7.2	19.9	5.9	18.9	7.2
51	49.2	13.6	18.8	8.8	16.9	7.0
52	42.1	13.1	15.1	7.5	21.1	7.8
53	55.7	10.5	15.3	9.4	21.3	9.7
Total Sample	51.1	14.6	16.7	4.9	19.7	9.2

* S.D - Standard Deviation

which consists of zones 4, 5 and 6, most of the buildings are either owned by the state or federal government and their occupants are normally working for the government or other multi-national companies.

The occupation of the respondents in table 4.13 indicates that there are wide variations in the occupation of household heads on neighbourhood basis. For instance, in Lagos Island which is divided into three zones (1,2 and 3), while the professionals/ business executives account for only 7.1% of those living in the area, in Victoria Island (zones 7,8 and 9) 75 percent of the household heads are professionals/business executives; in Ikeja (zones 32-49) the proportion is 50 percent; Mushin (zones 25-31) 6.4%, and Agege (zones 50-53) 1.9 percent. Most of the people living in Lagos Island are traders (46.4%) while other zones in Lagos Mainland (zones 10-20), Mushin and Agege have the mixture of civil servants, traders and artisans. The spatial variation in the results helps to confirm that further analysis of other variables will provide useful explanation to the research hypothesis.

Tables 4.15a & b show the type of buildings occupied by respondents. While similar zones share the same characteristics, the dissimilar ones show their distinct values. Whereas multiple family houses and storey buildings are very common in Lagos Island - zones 1,2 and 3 (75%), Lagos

Table 4.11 MEAN VALUES OF SOCIO-ECONOMIC SURVEY OF METROPOLITAN LAGOS (2)

Zone	INCOME		NPERS		NROOM	
	Mean	S.D	Mean	S.D	Mean	S.D
1	22078.6	14945.7	5.5	2.4	2.1	1.2
2	18650.0	9713.9	6.3	3.7	1.6	0.7
3	13266.7	6261.0	6.0	3.0	2.0	1.5
4	129600.0	88824.7	5.4	1.9	4.2	0.8
5	147000.0	74756.8	5.4	1.9	4.0	0.9
6	86000.0	81895.7	6.0	2.3	2.5	1.2
7	186000.0	72272.2	5.0	2.0	4.0	0.7
8	235000.0	17298.7	5.0	1.7	4.0	0.7
9	327500.0	172475.3	6.8	2.0	5.8	1.5
10	25840.0	11526.5	5.7	1.8	1.8	0.8
11	31727.0	20662.9	5.5	2.1	1.9	0.8
12	21400.0	11293.5	3.9	1.4	1.8	0.8
13	28750.0	10147.8	6.3	2.2	2.1	0.8
14	19085.7	85162.2	5.0	2.1	2.6	0.5
15	24288.9	12154.8	4.6	1.7	3.0	0.8
16	38231.6	40304.8	7.1	3.1	2.6	1.2
17	16320.0	6854.3	8.0	2.1	2.2	1.2
18	18466.7	12422.0	7.5	3.4	2.8	1.2
19	25550.0	20316.3	6.8	3.4	3.5	1.0
20	15325.0	7100.7	6.0	1.8	3.0	1.3
21	24815.4	23274.2	6.9	3.4	2.7	1.1
22	22200.0	29238.2	6.6	3.1	2.6	1.1
23	44000.0	17431.5	4.6	1.9	3.8	0.8
24	20933.3	19361.8	6.4	3.1	2.3	1.2
25	22118.7	14387.9	6.3	2.8	2.6	0.9
26	15123.1	9670.3	5.2	1.9	2.4	1.0
27	21706.7	18669.8	5.6	2.8	2.1	0.9
28	31444.4	21494.8	4.9	1.7	4.0	1.7
29	24418.2	23887.8	5.6	2.4	2.5	0.9
30	9600.0	2831.8	6.5	2.9	2.5	1.0
31	19244.0	27820.4	6.7	3.0	2.3	1.1
32	45000.0	16254.4	6.5	1.9	3.0	1.3
33	82500.0	19170.3	7.0	1.1	5.5	0.6
34	35000.0	16431.7	7.5	1.6	3.5	0.6
35	32000.0	8763.6	5.0	1.1	2.0	1.1
36	90000.0	10954.5	4.0	1.1	6.0	2.2
37	85000.0	5477.2	8.0	1.1	3.5	0.6
38	31000.0	16431.7	4.5	1.6	6.0	2.2
39	71250.0	19670.6	6.5	2.6	7.0	2.0
40	21000.0	17308.7	6.5	2.8	2.8	1.0

Zone	INCOME		NPERS		NROOM	
	Mean	S.D	Mean	S.D	Mean	S.D
41	58000.0	21264.6	5.8	2.3	4.3	1.1
42	48000.0	66143.8	5.7	2.2	3.0	0.9
43	134000.0	80671.3	8.6	2.2	6.8	1.8
44	122500.0	57977.3	6.0	2.0	5.3	2.0
45	40000.0	4053.3	9.7	3.3	4.3	1.3
46	23000.0	21908.9	7.5	1.6	4.5	0.6
47	15866.7	6700.0	4.3	1.8	2.0	0.9
48	21300.0	8879.2	5.5	2.6	2.5	1.2
49	16050.0	8899.9	5.3	2.0	2.0	0.7
50	20355.6	15783.5	6.6	1.8	2.2	0.6
51	18383.6	14480.1	6.1	3.2	2.3	1.1
52	18700.0	10539.6	5.9	2.6	2.2	0.9
53	16314.0	7953.8	7.3	3.0	2.9	1.3
Total Sample	51526.5	16974.0	6.1	2.5	3.3	1.3

S. D - Standard Deviation

Table 4.12 Tenure

Zone	Owner Occupied		Tenant	
	Fre.	%	Fre.	%
1	18	43	24	57
2	6	25	18	75
3	12	67	6	33
4	6	40	9	60
5	3	20	12	80
6	50	6	6	50
7	9	75	3	25
8	6	50	6	50
9	9	75	3	25
10	6	20	24	80
11	9	27	24	73
12	6	40	9	60
13	9	38	15	62
14	6	29	15	71
15	15	56	12	44
16	18	32	39	68
17	6	40	9	60
18	18	33	36	67
19	12	33	24	67
20	9	38	15	62
21	18	23	60	77
22	30	29	75	71
23	15	100	-	-
24	30	33	60	67
25	18	27	48	73
26	9	23	30	77
27	15	33	30	67
28	15	56	12	44
29	15	45	18	55
30	6	40	12	60
31	18	33	36	67
32	3	25	9	75
33	6	100	-	-
34	3	50	3	50
35	-	-	6	100
36	3	50	3	50
37	3	50	3	50
38	3	50	3	50
39	6	50	6	50

Zone	Owner Occupied		Tenant	
	Fre.	%	Fre.	%
40	15	37	9	63
41	9	75	3	25
42	6	67	3	33
43	12	80	3	20
44	6	50	6	50
45	3	33	6	67
46	3	33	6	50
47	3	25	9	67
48	3	25	9	75
49	3	25	9	75
50	6	22	21	78
51	24	33	48	67
52	15	36	27	64
53	6	29	15	71
Total sample	516	36.6	894	63.4

Table 4.13 Occupation

Zone	Professional/ Business Executives		Civil Servants/ Teachers		Traders		Artisans		Pensioners / Others	
	Fre.	%	Fre.	%	Fre.	%	Fre.	%	Fre.	%
1	6	14.3	18	42.9	6	14.3	9	21.4	3	7.1
2	-	-	15	62.5	3	12.5	3	12.5	3	12.5
3	-	-	6	33.3	6	33.3	3	16.7	3	16.7
4	9	60.0	6	40.0	-	-	-	-	-	-
5	3	20.0	12	80.0	-	-	-	-	-	-
6	3	25.0	-	-	3	25.0	3	25.0	3	25.0
7	9	75.0	3	25.0	-	-	-	-	-	-
8	9	75.0	3	25.0	-	-	-	-	-	-
9	9	75.0	3	25.0	-	-	-	-	-	-
10	6	20.0	9	20.0	9	30.0	6	20.0	-	-
11	3	9.1	15	45.5	6	18.1	9	27.3	-	-
12	-	-	3	20.0	3	20.0	3	20.0	6	40.0
13	-	-	9	37.5	9	37.5	6	75.0	-	-
14	3	14.3	6	28.6	6	28.6	6	28.6	-	-
15	9	33.3	6	22.2	6	22.2	6	22.2	-	-
16	12	21.1	15	26.3	15	26.3	9	15.8	6	10.5
17	-	-	6	40.0	6	40.0	3	20.0	-	-
18	6	11.1	12	22.2	12	22.2	15	27.8	9	16.7
19	12	32.3	12	33.3	12	33.3	-	-	-	-
20	-	-	6	25.0	9	37.5	9	37.5	-	-
21	21	26.9	15	19.2	15	19.2	15	19.2	12	15.4
22	12	11.4	30	28.6	30	28.6	21	20.0	12	11.4
23	9	60.0	6	40.0	-	-	-	-	-	-
24	9	10.0	36	40.0	24	26.7	12	13.3	9	10.0
25	6	9.1	12	18.2	24	36.4	18	27.3	6	9.1
26	3	7.7	9	23.1	15	38.5	9	23.1	3	7.7
27	-	-	15	33.3	15	38.3	15	33.3	-	-
28	6	22.2	9	33.3	6	22.2	6	22.2	-	-
29	-	-	15	45.5	15	45.5	3	9.1	-	-
30	-	-	6	33.3	6	33.3	6	33.3	-	-
31	3	5.6	9	16.7	15	27.8	18	33.3	9	16.7
32	9	25.0	3	25.0	-	-	-	-	-	-
33	6	100.0	-	-	-	-	-	-	-	-
34	3	50.0	3	50.0	-	-	-	-	-	-
35	-	-	3	50.0	3	50.0	-	-	-	-
36	6	100.0	-	-	-	-	-	-	-	-
37	3	50.0	3	50.0	-	-	-	-	-	-
38	6	100.0	-	-	-	-	-	-	-	-

Zone	Professional/ Business Executives		Civil Servants/ Teachers		Traders		Artisans		Pensioners / Others	
	Fre.	%	Fre.	%	Fre.	%	Fre.	%	Fre.	%
39	9	25.0	3	25.0	6	-	-	-	-	-
40	3	12.5	9	37.5	6	25.0	3	12.5	3	12.5
41	9	75	3	25	-	-	-	-	-	-
42	3	33.3	3	33.3	3	33.3	-	-	-	-
43	15	100.0	-	-	-	-	-	-	-	-
44	12	100.0	-	-	-	-	-	-	-	-
45	3	33.0	6	66.7	-	-	-	-	-	-
46	3	50	3	50	-	-	-	-	-	-
47	-	-	3	33.3	3	33.3	3	33.3	-	-
48	-	-	3	25.0	3	25.0	3	25.0	3	25.0
49	-	-	3	25.0	3	25.0	3	25.0	3	25.0
50	-	-	9	33.3	9	33.3	9	33.3	-	-
51	3	4.2	18	25.0	18	25.0	24	33.3	9	12.5
52	-	-	6	7.1	21	50.0	15	35.7	3	7.1
53	-	-		28.6	9	42.9	6	28.6	-	-
Total	255	18.1	417	29.6	354	25.1	279	19.8	10	7.4

Table 4.14 Education

Zone	No Formal Education		Pry. School		Sec. School		OND/NCE		HND/B.Sc. & Above	
	Fre.	%	Fre.	%	Fre.	%	Fre.	%	Fre.	%
1	9	21.4	15	35.7	6	14.3	6	14.3	6	14.3
2	3	12.5	9	25.0	9	37.5	3	12.5	3	12.5
3	3	16.7	9	50.0	3	16.7	-	-	3	16.7
4	-	-	-	-	-	-	-	-	15	100.0
5	-	-	-	-	-	-	3	20.0	12	100.0
6	-	-	3	25.0	3	25.0	3	25.0	3	25.0
7	-	-	-	-	-	-	-	-	12	100.0
8	-	-	-	-	-	-	-	-	12	100.0
9	-	-	-	-	-	-	3	25.0	9	75.0
10	6	20.0	12	40.0	6	20.0	3	10.0	-	-
11	3	9.1	15	45.5	6	18.2	9	27.3	-	-
12	-	-	6	40.0	6	40.0	3	20.0	-	-
13	-	-	3	12.5	6	25.0	9	37.5	6	25.0
14	3	14.3	9	42.9	3	14.3	6	28.6	-	-
15	-	-	6	22.2	9	33.3	6	22.2	6	22.2
16	9	15.8	15	26.3	12	21.1	9	15.8	12	21.2
17	3	20.0	3	20.0	3	20.0	3	20.0	3	20.0
18	9	16.7	15	27.8	12	22.2	9	16.7	9	16.7
19	-	-	-	-	6	16.7	15	41.7	15	41.7
20	3	12.5	3	12.5	6	25.0	6	25.0	6	25.0
21	12	15.4	21	26.9	15	19.2	15	19.2	15	19.2
22	15	14.3	30	28.6	30	28.6	18	17.1	12	11.4
23	-	-	-	-	-	-	-	-	15	100.0
24	9	10.0	15	16.7	27	30.0	18	20.0	21	23.3
25	12	18.2	12	18.2	18	27.3	12	18.2	12	18.2
26	6	15.4	6	15.4	12	30.8	9	23.1	6	15.4
27	15	33.3	9	20.0	6	13.3	9	20.0	6	13.3
28	-	-	6	20.0	6	20.0	12	40.0	6	20.0
29	6	18.2	9	27.3	6	18.2	6	18.2	6	18.2
30	3	16.7	6	33.3	6	33.3	3	16.7	-	-
31	12	22.2	15	27.8	15	27.8	6	11.1	6	11.1
32	-	-	-	-	-	-	3	25.0	9	75.0
33	-	-	-	-	-	-	-	-	6	100.0
34	-	-	-	-	-	-	-	-	6	100.0
35	-	-	-	-	3	50.0	3	50.0	-	-
36	-	-	-	-	-	-	-	-	6	100.0
37	-	-	-	-	-	-	3	50.0	3	50.0
38	-	-	-	-	-	-	-	-	6	100.0
39	-	-	-	-	-	-	3	25.0	9	75.0

Zone	No Formal Education		Pry. School		Sec. School		OND/NCE		HND/B.Sc.& Above	
	Fre.	%	Fre.	%	Fre.	%	Fre.	%	Fre.	%
40	6	25.0	3	12.5	3	12.5	6	25.0	6	25.0
41	-	-	-	-	-	-	3	25.0	9	75.0
42	-	-	-	-	-	-	-	-	9	100.0
43	-	-	-	-	-	-	-	-	15	100.0
44	-	-	-	-	-	-	-	-	12	100.0
45	-	-	-	-	-	-	3	33.3	6	66.7
46	-	-	-	-	-	-	-	-	6	100.0
47	3	33.3	3	33.3	3	33.3	-	-	-	-
48	-	-	3	25.5	3	25.0	6	50.0	-	-
49	-	-	3	25.0	3	25.0	3	25.0	3	25.0
50	3	11.1	3	11.1	6	22.2	9	33.3	6	22.2
51	12	16.7	21	29.2	12	16.7	18	25.0	9	12.5
52	6	14.3	18	42.9	6	14.3	6	14.3	6	14.3
53	3	14.3	6	28.6	3	14.3	6	28.6	3	14.3
Total	174	12.3	309	21.9	279	19.8	273	19.4	375	26.6

Table 4.15 Type of Building

Zone	Bungalow		Duplex		Flat		Storey Building		Multi family/ Rooming House	
	Fre.	%	Fre.	%	Fre.	%	Fre.	%	Fre.	%
1	-	-	-	-	12	28.6	3	7.1	27	64.3
2	-	-	-	-	3	12.5	3	12.5	18	75.0
3	3	-	-	-	3	20.0	3	20.0	9	60.0
4	3	20.0	9	60.0	3	20.0	-	-	-	-
5	3	20.0	9	60.0	3	20.0	-	-	-	-
6	-	-	3	25.0	3	25.0	3	25.0	3	25.0
7	-	-	12	100	-	-	-	-	-	-
8	3	25.0	6	50	3	25.0	-	-	-	-
9	-	-	9	25.0	3	25.0	-	-	-	-
10	3	10.0	-	-	6	20.0	6	20.0	15	50.0
11	6	18.2	3	9.1	3	9.1	6	18.2	15	45.5
12	3	20.0	3	20.0	6	40.0	3	20.0	-	-
13	12	50.0	-	-	6	25.0	6	25.0	-	-
14	6	28.6	6	28.6	6	28.6	3	14.3	-	-
15	3	11.1	-	-	3	11.1	3	11.1	18	66.7
16	18	31.6	6	10.5	12	21.1	9	15.8	12	21.1
17	-	-	-	-	3	20.0	6	40.0	6	40.0
18	15	27.8	6	11.1	12	22.2	9	16.7	12	22.2
19	6	16.6	3	8.3	6	16.6	3	8.3	18	50.0
20	3	12.5	-	-	3	12.5	3	12.5	15	62.5
21	12	15.4	6	7.7	18	23.1	12	15.4	30	38.5
22	9	8.6	15	14.3	27	25.7	12	11.4	42	40.0
23	6	40.0	6	4.0	3	20.0	-	-	-	-
24	21	22.6	6	6.5	18	19.4	12	12.9	36	38.7
25	6	9.1	6	9.1	6	9.1	18	27.3	30	45.5
26	3	7.7	6	15.4	3	7.7	9	23.1	18	46.2
27	6	13.3	3	6.7	15	33.3	6	13.3	15	33.3
28	3	11.1	3	11.1	9	33.3	3	11.1	9	33.3
29	3	9.1	9	27.3	9	27.3	12	36.4	-	-
30	3	16.7	3	16.7	6	33.3	3	16.7	3	16.7
31	6	11.8	6	11.8	9	17.7	15	29.4	15	29.4
32	-	-	6	50.0	3	25.0	-	-	3	29.4
33	-	-	6	100.0	-	-	-	-	-	-
34	-	-	-	-	3	50.0	-	-	3	50.0
35	-	-	-	-	3	50.0	-	-	3	50.0

Zone	Bungalow		Duplex		Flat		Storey Building		Multi family/ Rooming House	
	Fre.	%	Fre.	%	Fre.	%	Fre.	%	Fre.	%
36	-	-	6	50.0	6	50.0	-	-	-	-
37	3	33.3	3	33.3	3	33.3	-	-	-	-
38	-	-	6	100.0	-	-	-	-	-	-
39	3	33.3	-	-	3	33.3	-	-	-	33.3
40	3	25.0	-	-	3	25.0	3	25.0	3	25.0
41	3	25.0	-	-	3	25.0	3	25.0	3	25.0
42	-	-	3	33.3	3	33.3	3	33.3	-	-
43	-	-	9	60.0	6	40.0	-	-	-	-
44	-	-	6	50.0	6	50.0	-	-	-	-
45	3	33.3	3	33.3	3	33.3	-	-	-	-
46	-	-	6	100.0	-	-	-	-	-	-
47	3	33.3	-	-	3	33.3	-	-	-	33.3
48	3	25.0	-	-	3	25.0	3	25.0	3	25.0
49	3	25.0	-	-	3	25.0	3	25.0	3	25.0
50	3	11.1	3	11.1	3	11.1	6	22.2	12	44.4
51	6	8.3	6	8.3	12	16.7	18	25.0	30	41.7
52	6	14.3	3	7.1	12	28.6	9	21.4	12	28.6
53	3	14.3	3	14.3	3	14.3	6	28.6	6	28.6
Total	204	14.5	231	16.4	300	21.3	225	16.0	447	31.7

Table 4.15b TYPE OF BUILDING OCCUPIED BY RESPONDENTS

	Lagos Island	Ikoyi	Victoria Island	Lagos Mainland	Somolu	Mushin	Ikeja	Agege	Total
	Freq %	Freq %	Freq %	Freq %	Freq %	Freq %	Freq %	Freq %	Freq %
Bungalow	3	6	3	75	42	30	27	18	204
	43.6	14.3	8.3	22.3	14.6	10.6	15	11.1	14.5
Duplex	-	21	27	27	33	39	69	15	231
	-	50	75	8	11.5	13.8	38.3	9.3	16.4
Flat	18	9	6	66	66	57	48	30	300
	21.4	21.4	16.7	19.6	22.9	20.2	26.7	18.5	21.3
Storey	9	3	-	57	36	66	15	39	225
Building	10.7	7.1	-	17	12.5	23.4	8.3	24.1	16
Rooming	54	3	-	111	108	90	21	60	447
House/ Multi	64.3	7.1	-	33	37.5	31.9	17.7	37	31.7
Family	84	42	36	336	288	282	180	162	1410
Total	100	100	100	100	100	100	100	100	100

Source: Field Work, 1993

Mainland - zones 10-20 (50%), Somolu - zones 21-24 (50%), Mushin - zones 25-31 (55.1%) and Agege - zones 50-53 (61.1%), bungalows, duplexes and flats are the common things in Ikoyi - zones 4-6 (85.7%), Victoria Island - zones 7-9 (100%) and Ikeja -zones 32-49 (80%). Using smaller scale, there are distinct variations in neighbourhoods, and these distinct spatial variations are explained in chapter five.

4.6a House Values and Socio-Economic Attributes

Having described the variations in the socio-economic variables as it affects house prices above, it is also necessary to assess them qualitatively. Since the variables are satisfactorily measured on ratio or interval scale, a multiple regression model is prefered. For purposes of explanation, it is usual to transform the partial regression coefficients into standard forms by dividing each coefficient by its standard error to yield Beta coefficients. The Beta coefficients represent the weights of the contribution of each variable into the predictive or explanatory model (Anderson,1962; Ansélin,1988; Ayeni,1979; and Casetti,1972).

The stepwise regression method which has the distinguishing ability to perform the regression analysis by identifying the relative importance of the predictor variables were entered accordingly and the six predictive variables were

selected. These are the level of education measured by the number of years spent in school, length of stay of the head of the household in the house, age of the household head, number of rooms occupied by household, number of persons in the household, and the yearly income of the head of household. The dependent variable is the housing values or house rental values recorded by each of 1410 households. The first concerns of this research is the order of importance and proportion of the variance explained by each of the predictor variables, while the second concerns the overall interpretation of the regression model.

Table 4.16 shows the variables in their order of importance and their relative contributions to the variance. It is significant to note that the annual income of the household head is the most significant predictor or independent variable of house values (R = 0.710). This implies that the income of household head will determine the units of housing consumption of the household and this invariably affects the choice of the location and neighbourhood in which to live. These different neighbourhoods have different housing values and, in essence, the higher the income, the higher the ability to pay for better accommodation . The R value which is 0.710 shows a strong strength of the association between income and house rental values. Also, the R^2 calculates the

Table 4.16 Stepwise Regression Model of Socio-Economic Variables of House values

Step	Variables	R	R^2	Beta	t-vales	F-ratio
1	INCOME	0.710	0.504	0.710	37.858*	1433.234
2	NROOM	0.732	0.536	0.574	25.085*	811.894
3	LHOUSE	0.747	0.558	-0.154	-8.352*	590.964
4	EDUCQ	0.754	0.569	0.192	5.947*	462.599
5	NPERS	0.761	0.579	-0.139	-5.906*	386.226
6	AGE	0.762	0.581	0.065	2.285*	323.692

N = 1410

*Coefficient significant at 95 percent confidence level

Definition of Variables

INCOME - Yearly income of household head
NROOM - Number of rooms occupied by household
LHOUSE - Length of stay of household in the house (Years)
EDUCQ - Education by the number of years spent in school
AGE - Age of the household head
NPERS - Number of persons in the household

Table 4.17 Hedonic Regression of Socio-Economic variables of Metropolitan Lagos

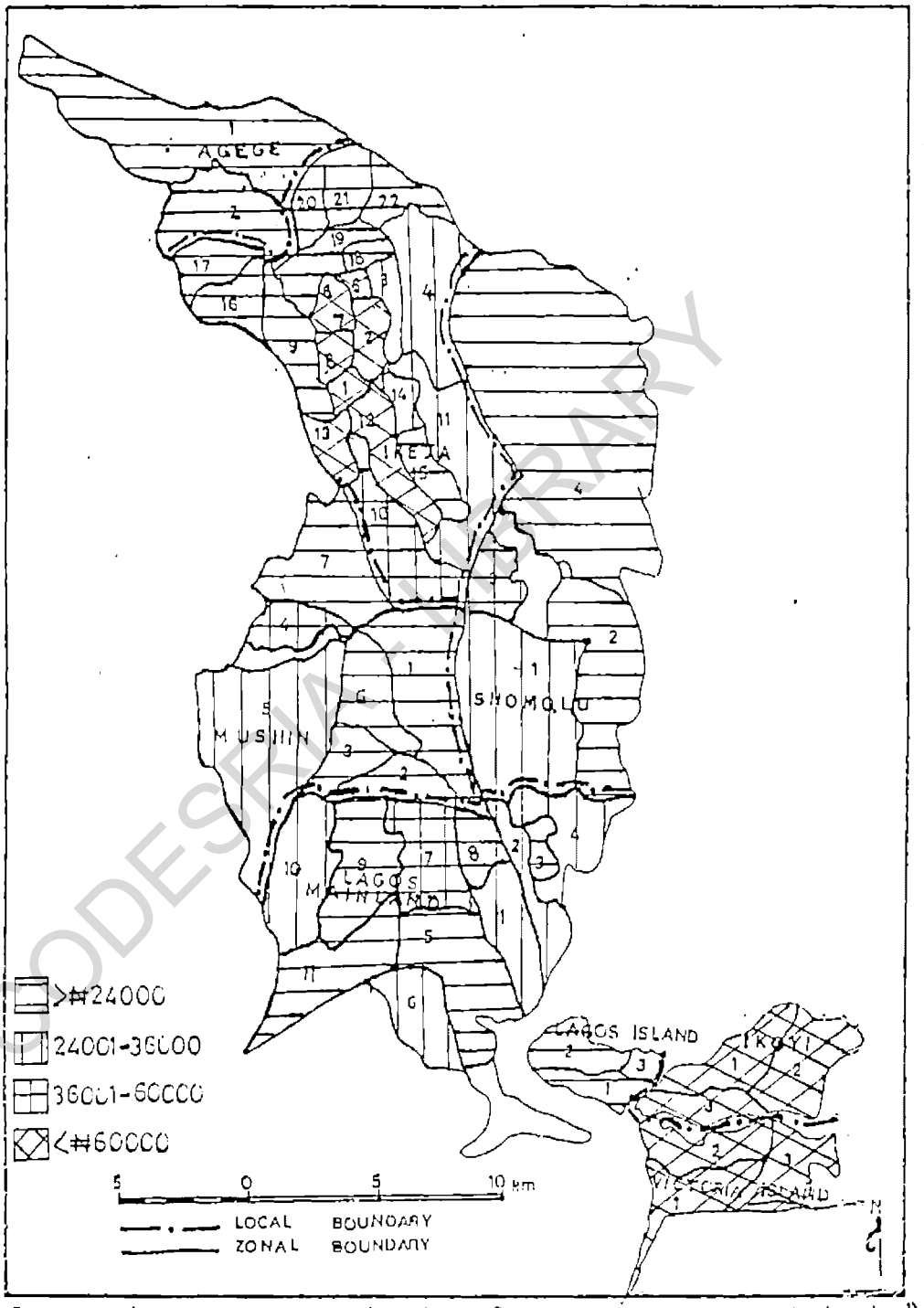
	Beta	t-value
INCOME	0.504	22.030*
NROOM	0.194	6.364*
LHOUSE	-0.171	-7.764*
EDUCQ	0.194	5.677*
NPERS	-0.159	-6.340*
AGE	0.065	2.285*
Constant	0.513	8.551
Multiple R	0.762	
R Square	0.581	
F-Ratio	323.692	
N	1410	

* Coefficient significant at 95 percent confidence level

proportion of variance and it shows that income has correlation of determination of 50.4 percent. This is very significant as its contribution is over 50 percent. Since it has been observed in several other studies (Ayeni,1974; Follain et al.,1980; Lim et al.,1984; Strassman,1980; Ingram,1981; Megbolugbe,1983,1986,1989; Ndulo,1985,1986; Jimenez and Keare,1989; Sheffer,1990; Arimah,1990) that the higher the annual rent, the higher is the socio-economic class of the household, it may be argued that this analysis further substantiates the importance of the income factor. Also, Williams (1979), Li and Brown (1980), Jud and Watts (1981) observed while analysing the location and neighbourhood choices of households that the best and most significant variable is the mean income. The zonal variation in the mean yearly income of the household heads is shown in table 4.11 and figures 4.2

The second most important variable in the stepwise regression is the number of rooms occupied by the household (R = 0.732). There is generally a high correlation between number of rooms occupied and the house rental values. For it is expected that the more the units of housing consumed the more the house rental values. The two variables (income and number of rooms) contributed 53.6 percent to the explanation of the housing values (but the second variable on its own explains

FIG. 4.2 MAP OF METROPOLITAN LAGOS SHOWING THE ANNUAL MEAN INCOME IN THE ZONES



Source: Lagos State Valuation Office, Alausa, 1993(Adapted)

3.2%). The zonal variation of the number of rooms occupied by households is shown in table 4.11. It is observed that clustered, less planned and low income areas in some neighbourhoods have average rooms of less than 3, while the well planned and high income neighbourhoods are with single families occupying buildings with multiple rooms over 3. This finding conforms with earlier studies (Megbolugbe,1983; Ball and Kirwan,1977; Follain and Malpezzi,1981; Ellickson,1981; Linneman,1981; Ridker and Henning,1976; and Arimah,1990) that the number of rooms greatly contributes to the explanation of housing values.

The next independent variable or significant predictor of housing values is the length of stay in the house. Athough the R increased to 0.747 and the R^2 showed a total contribution of 55.8 percent (an additional contribution of 22% to the first two variables), it could be observed that the regression coefficient showed a negative sign. This is an indication that there is no positive relationship between the length of stay in a house and the house value. The increase in the number of years spent in a house do not necessarily result in an increase in the house rental values. Other factors have to be taken into consideration with the years spent in the house for logical explanation in the increase of house values.

The level of education of the household head is another

predictor variable in the order of importance of the house values. This variable also shows its relative contribution to the variance (R = 0.754). Although education is not among the first three important variables, it is the belief of the author that housing prices are not necessarily affected by the level of education of households but the ability to pay the rental charges. It is with this belief that education being ranked as the fourth important variable is accepted. Though, some high income neighbourhoods are known to comprise of professionals and business executives as shown in table 4.15, their level of education could not be used to determine the housing values. Ayeni (1979) also showed that the level of education is last among the six predictor variables and do not contribute much to the volume of trips generated at the household level since its effect has already been subsumed under income.

Another significant predictor of the house rental values is the number of persons in a household. As expected, the regression coefficient showed a negative sign. This implies that there is no positive relationship between the number of persons in a household and the house rental values. The t value (-5.906) has a negative sign but it is significant at 95 percent confidence level. Most of the high income neighbourhoods are known to be low density areas and therefore

there is no positive relationship between number of persons in a household and the house prices. The zonal variation of the number of persons in the households is shown in table 4.11.

The age of the household head is the last predictor variable and does not contribute much to the explanation of the house rental values at the household level. The finding is anticipated because more often than not, housing values particularly housing rent, are strongly tied to income and the number of rooms occupied and not necessarily to the age of the households. The above results are adequate especially the order of importance of the predictor variables of housing values at the household level. The second concern of the analysis is the overall interpretation of the regression model presented in table 4.17. The correlation coefficient of 0.762 is found to be highly significant at 0.05 level, implying that the correlation between the criterion/ dependent and predictor variables is not a chance occurence. The analysis of variance value of F = 323.692 also confirms the significance of the regression equation as an explanatory model. All the variables are significant at the 0.05 level and this means that as far as metropolitan Lagos is concerned, all the variables determine to a large extent the housing values of the household.

Although the regression model produced a multiple

correlation coefficient of 0.762, it should be noted that the coefficient of determination R^2 is also 0.581, implying that the socio-economic variables used in the analysis could explain 58.1 percent of the total variation. Although all the variables are highly significant, if other variables measured in non ratio and internal scale have been measured appropriately and added to the predictor variables, there would have been a higher level of explanation of the total variation. All the same, the coefficient of determination R^2 = 58.1 percent is also high enough to explain the total variation of housing values in metropolitan Lagos.

4.7 CONCLUSION

In conclusion, the overall results show that there are significant variations in all the explanatory variables. There are spatial variations of neighbourhood and locational attributes on house rental charges. The variability is much more experienced within group means than between group means i.e., there are lots of variations for individual houses within the same locations and neighbourhoods. However, why some variables show high variability in the different neighbourhoods, some are not significant. The yearly income of the household head is noted to be the most significant predictor of the house values and there is a strong

association between income and house values. Other important variables are type of people living in the area and area of land occupied. The analysis proved the important role of neighbourhoods in house rental charges. The significant variations in almost all the variables in the different neighbourhoods were attributed to the various locational differences which exist in the housing structures.

Most of the people living in Lagos Island work on the Island, other neighbourhood residents recorded low percentages as those commuting daily with the Island. Most residents work within their areas thereby invalidating the importance of the CBD and emphasising the multi-nuclei nature of the study area.

There is also an improvement in the analysis over previous ones as some of the neighbourhood attributes were measured with specific units of provision of the facilities. The idea that neighbourhood variables are problematic, intangible and difficult to measure objeotively could not be sustained.

CHAPTER FIVE

SPATIAL SCALES AND MEASUREMENT OF HOUSING VALUES

5.1 INTRODUCTION

The fact that there is spatial disparity in the distribution and quality of public services and infrastructural facilities means there is locational variation within the sub-areas of the metropolis. For a city is in reality a very heterogenous entity. This chapter therefore shows how house values vary by area and the role of changes in spatial scale in the understanding of housing values. The hypothesis to be tested is that the use of distinct spatial scales within cities for investigation, affects the measurement and interpretation of housing values. This is to arque that rental values could vary significantly between large and heterogeneous neighbourhoods and more refined near homogeneous areas of investigation. Thus, the choice of an appropriate scale is necessary for correct interpretation of the nature and pattern of variation. This chapter examines these variations across different definitions of sub-area units for investigation and relates this to issue of defining housing markets spatially. A combination of analysis of variance, multiple regression model, factor analysis and non hierarchical techniques of grouping will be used to test the hypothesis.

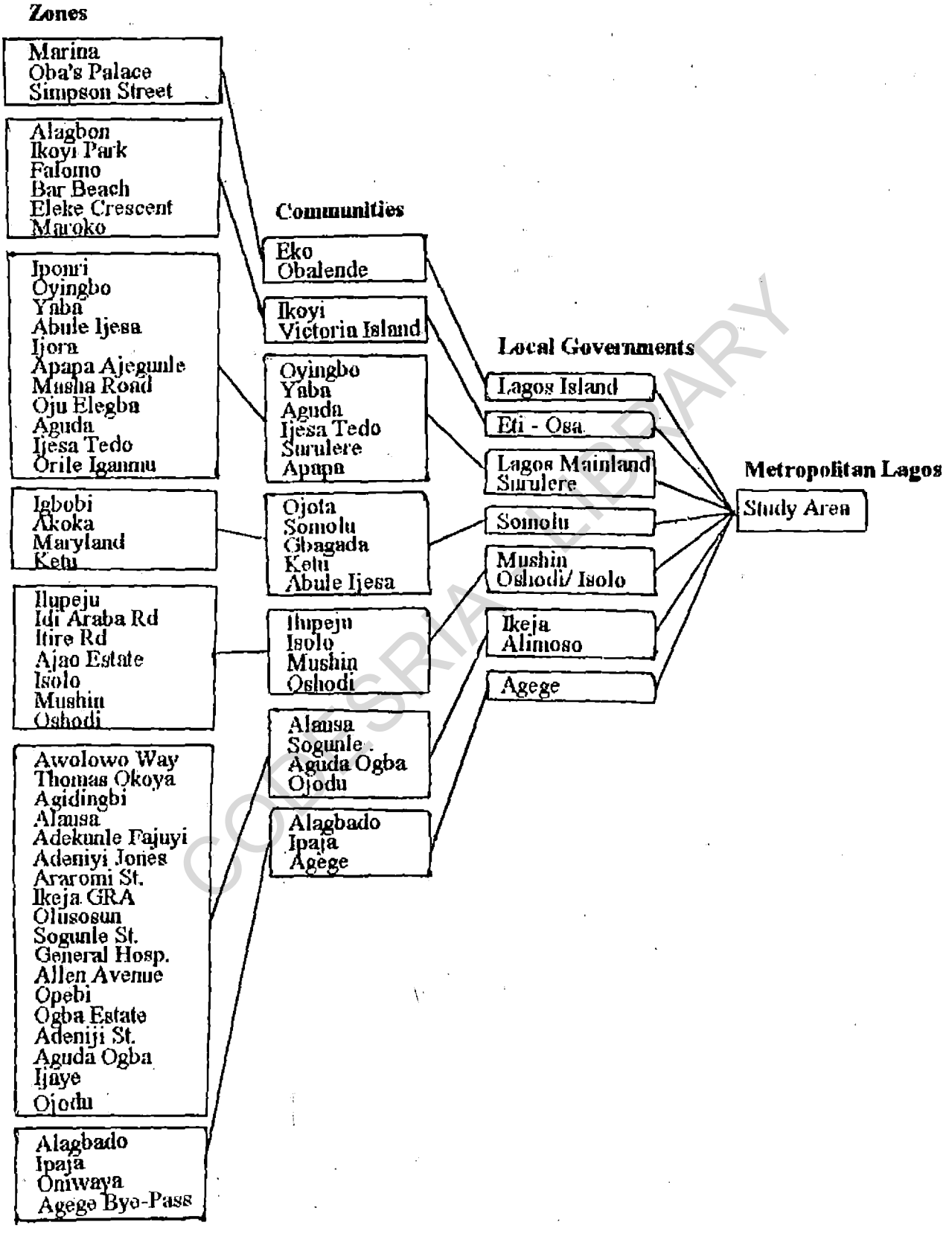
5.2 SPATIAL SCALE AND PATTERN OF HOUSING ATTRIBUTES

Housing values within a city are either aggregated or disaggregated over households in order to examine their variations. Consequently, the geographical scale used always determines the level of the disaggregation of data. In this section, variation over four different scales will be examined. The description of the different levels of geograghical scale is presented in figure 5.1.

The first level is when a city is studied as a whole and this is the highest level of aggregative data. Another level of scale is when analysis is performed on the basis of local governments that exists within the metropolitan area. Although most cities in Nigeria have few local governments, the study area (metropolitan Lagos) has 10 local governments. The level of data at this second scale is also still aggregative. The third level of scale is the analysis of the city on basis of communities that exist therein. This is when the city is either studied on neighbourhood basis or when one uses specific areas as proposed in the multiple nuclei model. The data at this level may or may not be disaggregated depending on the size of the zones. The example of such neighbourhoods as related to the study area are: Ikeja, Mushin, Ketu, Oshodi, Apapa-Ajegunle, Surulere, Yaba, Ojota, Ikoyi and so on.

The fourth level of geographical scale is when the city

Fig. 5.1 Description of Different Levels of Geographical Scale



is divided into zones, wards, enumeration areas or other small units. The highest level of disaggregative data occur where cities are divided into small areas for better examination of the households characteristics and distinct analysis of submarkets. For the collection of valuation data, the estate agents identified 53 zones in metropolitan Lagos. The zones were sufficiently homogeneous to constitute distinct spatial markets. The zones and the description of the areas are presented in table 5.1. In the next section, we shall evaluate variation in house values at the three levels for comparative purposes. However, the greatest emphasis will be on the fourth scale which is the zonal level because of the need to evaluate the extent to which the units at this level are distinct.

5.2a Variation of Housing Values by Local Governments, Communities and Zones

The local government areas in metropolitan Lagos are Agege, Eti-Osa, Ikeja, Alimoso, Lagos Island, Lagos Mainland, Mushin, Somolu, Surulere and Oshodi/Isolo. Mean housing values for each of the local government areas are shown in table 5.2. Clearly there are 3 or 4 types of groups from the table. The first group which comprise of Eti-Osa local government is a very distinct local government with house values of #186,000. There was no other local government that has any value as high

Table 5.1 Spatial Variation of Mean Housing Attributes in Metropolitan Lagos

Zone	Descriptions	INCOME	HRENT	NPERS	NROOM
1	Marina	22078.6	25670.0	5.5	2.1
2	Oba's Palace	18650.0	14337.5	6.3	1.6
3	Simpson Street	13266.7	13700.0	6.0	2.0
4	Alagbon	129600.0	118000.0	5.4	4.2
5	Ikoyi Park	147000.0	188000.0	5.4	4.0
6	Falomo	86000.0	116250.0	6.0	2.5
7	Bar Beach	186000.0	253000.0	5.0	4.0
8	Eleke Crescent	235000.0	292500.0	5.0	4.0
9	Maroko	327500.0	250000.0	6.8	2.5
10	Iponri	25840.0	8528.0	5.7	1.8
11	Oyingbo	31727.0	4094.5	5.5	1.9
12	Yaba	21400.0	17496.0	3.6	1.8
13	Abule Ijesha	28750.0	7382.5	6.3	2.1
14	Ijora	19085.7	13231.4	5.0	2.6
15	Apapa Ajegunle	24288.9	9177.8	4.6	3.0
16	Masha Road	38231.6	16247.4	7.1	2.6
17	Oju Elegba	16320.0	8300.0	8.0	2.2
18	Aguda	18466.7	15133.9	7.5	2.8
19	Ijesha Tedo	25550.0	8375.0	6.8	3.5
20	Orile Iganmu	15325.0	9000.0	6.0	3.0
21	Igbobi	24815.0	13500.0	6.9	2.7
22	Akoka	22200.0	7320.0	6.6	2.6
23	Maryland	44000.0	15040.0	4.6	3.8
24	Ketu	20933.3	7766.7	6.4	2.3
25	Ilupeju	22118.7	10318.2	6.3	2.6
26	Idi Araba Road	15123.1	9461.5	5.2	2.4
27	Itire Road	21706.1	12000.0	5.6	2.1
28	Ajao Estate	31444.4	17888.9	4.9	4.0
29	Isolo	24418.2	9363.6	5.6	2.5
30	Mushin	9600.0	8500.0	6.5	2.5
31	Oshodi	19244.0	9055.6	6.7	2.3
32	Awolowo Way	45000.0	27250.0	6.5	3.0
33	Thomas Okoya	82500.0	50000.0	7.0	5.5
34	Agidingbi	35000.0	27500.0	7.5	3.5
35	Alausa	32000.0	27500.0	5.0	2.0
36	Adekunle Fajuyi	90000.0	52500.0	4.0	6.0
37	Adeniyi Jones	85000.0	32500.0	8.0	3.5
38	Araromi Street	31000.0	8000.0	4.5	6.0
39	Ikeja G.R.A	71250.0	53750.0	6.5	7.0
40	Olusosun	21000.0	19250.0	6.5	2.8
41	Shogunle Street	58000.0	30500.0	5.8	4.3

Zone	Descriptions	INCOME	HRENT	NPERS	NROOM
42	General Hospital	48000.0	30500.0	5.7	3.0
43	Allen Avenue	134000	106000.0	8.6	6.8
44	Opebi	122500.0	71250.0	6.0	5.3
45	Ogba Estate	40000.0	16666.7	9.7	4.3
46	Adeniji Street	23000.0	20000.0	7.5	4.5
47	Ajuda-Ogba	15866.7	17666.1	4.3	2.0
48	Ijaye	21300.0	7000.0	5.5	2.5
49	Ojodu	16050.0	9000.0	5.3	2.0
50	Alagbado	20355.6	6333.3	6.6	2.2
51	Ipaja	18383.3	6658.3	6.1	2.3
52	Oniwaya	18700.0	7357.1	5.9	2.2
53	Agege Bye-Pass	16314.0	5000.0	7.3	2.9
Total Sample		51526.5	39836.3	6.1	3.3

Source: Field work, 1993

as this figure. The second group consists of Ikeja and Alimosho local governments with house values of between #30,000 and #72,000. The third type of group contained local governments with house values that range between #10,000 and #25,000. The local governments in this group are Lagos Island, Lagos Mainland Somolu and Surulere. The fourh identified group of house values was also very distinct with low figures, they were extremes of the first group. They are below #10,000 and they consist of Agege, Mushin and Oshodi local governments.

Table 5.2 Housing Values by Local Governments

Local Governments	House Values (Mean) (#)	No.of Properties
1. Agege	6,658	15,170
2. Eti-Osa	186,000	6,471
3. Ikeja	71,250	13,176
4. Alimosho	30,000	4,052
5. Lagos Island	18,650	8,046
6. Lagos Mainland	15,850	15,070
7. Mushin	8,400	17,003
8. Somolu	17,200	27,966
9. Surulere	15,700	18,568
10.Oshodi/Isolo	8,500	10,298

Source: Lagos State Valuation Office; Field Work, 1993

There are twenty five communities defined on geograghic units within which certain social relationships exist (see Table 5.3 and Figure 5.1). Table 5.3 shows the variations in the housing values by communities. The house values by communities in table 5.3 could also be grouped into four. The first group are the communities with house values less than #22,000. They consist of communities like Mushin, Ketu, Oshodi, Ojota, Eko, Agege, Oyingbo, Aguda, Ojodu, Ipaja, Alagbado and Abule Ijesa. The second group of communities are those with house values between #22,000 and #40,000. The communities with these values are Apapa, Isolo, Sogunle, Ijesa Tedo, Somolu, Alausa and Gbagada. The communities within the third group are Surulere, Yaba and Ilupeju and they have house values between #41,000 and #90,000. The fourth type of communities are those with house values above #90,000. The communities in these group are Ikeja, Ikoyi and Victoria Island and they have the highest house values.

There are two reasons that make the house values by local governments in table 5.2 different from house values by commmunities in table 5.3. The first one is that mean house values by local governments are lower than house values for communities that bear the same name, and this is because of the more aggregative data of the local government.

Table 5.3 Housing Values by Communities

	Communities	House Values (mean) (#)	No.of Properties
1.	Ikeja	90,000	9,124
2.	Mushin	10,000	4,500
3.	Ketu	20,900	14,200
4.	Oshodi	19,200	7,500
5.	Apapa	24,500	5,400
6.	Surulere	50,000	6,100
7.	Yaba	45,000	5,500
8.	Ojota	21,000	500
9.	Ikoyi	150,000	4,139
10.	Eko	15,000	4,500
11.	V.I.	250,000	2,500
12.	Agege	18,000	6,800
13.	Isolo	24,000	5,200
14.	Sogunle	22,000	600
15.	Oyingbo	21,000	4,200
16.	Aguda	20,000	1,500
17.	Ojodu	16,000	2,100
18.	Ipaja	18,000	8,800
19.	Alagbado	20,000	4,700
20.	Ijesa Tedo	26,000	5,900
21.	Somolu	35,000	9,500
22.	Alausa	32,000	500
23.	Gbagada	38,000	5,000
24.	Abule Ijesa	20,000	3,500
25.	Ilupeju	60,000	8,900

Source: Lagos State Valuation Office; Field Work, 1993

The second thing that distinquish table 5.2 from table 5.3 is that the number of properties in the local governments are more than the properties in the communities. This is because the areas covered by the communities are smaller than the areas covered by the local governments. This account for the reason why house values in the communities are more than the house values in the local governments because the properties are fewer and the mean values are disaggregated. Therefore, the geographical scale on community basis is better than that of the local government.

Table 5.4 shows the variation in house values by zones. The zonal values could be grouped into four. The first zonal group are zones with house values below #10,000. The zones consist of Oyingbo, Iponri, Abule Ijesa, Ajegunle, Oju Elegba, Ketu, Isolo, Mushin, Oshodi, Alagbado, Ipaja and Oniwaya. The second type of zonal group are the zones with house values between #10,000 and #25,000. The zones in the second group are Oba's Palace, Yaba, Ijora, Masha, Aguda, Igbobi, Ogba, Itire and Ajao Estate. The house values between #25,000 and #49,000 are those that form the third group and the areas in this group are Marina, Awolowo Way, Agidingbi, Alausa, Adeniyi Jones and Sogunle. The fourth zonal group consists of zones with house values above #50,000 and they include Alagbon, Ikoyi, Falomo, Eleke Crescent, Victoria Annex, Thomas Okoya,

Table 5.4 Variation of Housing Values by Zones

Zones	Description	No of Property	House Values (#)
1.	Marina	4465	25,670.0
2.	Oba's Palace	3234	14,337.5
3.	Simpson Street	347	13,700.0
4.	Alagbon	1023	118,000.0
5.	Ikoyi Park	793	188,000.0
6.	Falomo	516	116,250.0
7.	Bar Beach	1565	253,000.0
8.	Eleke Crescent	1450	292,500.0
9	Maroko	1124	250,000.0
10.	Iponri	2972	8,528.0
11.	Oyingbo	3324	4,094.5
12.	Yaba	1442	17,496.0
13.	Abule Ijesa	2374	7,382.5
14.	Ijora	2282	13,231.4
15.	Apapa Ajegunle	2676	9,177.8
16.	Masha Road	5608	16,247.4
17.	Oju Elegba	1403	8,300.0
18.	Aguda	5338	15,133.9
19.	Ijesa Tedo	3760	8,375.0
20.	Orile Iganmu	2459	9,000.0
21.	Igbobi	7601	13,500.0
22.	Akoka	10219	7,320.0
23.	Maryland	1423	15,040.0
24.	Ketu	8723	7766.7
25.	Ilupeju	6270	10318.2
26.	Idi Araba Rd	3684	9,461.5
27.	Itire Rd	4311	12,000.0
28.	Ajao Estate	2738	17,888.9
29.	Isolo	3270	9,363.0
30.	Mushin	1834	8,500.0
31.	Oshodi	5194	9,055.6
32.	Awolowo Way	1207	27,250
33.	Thomas Okoya	408	50,000.0
34.	Agidingbi	72	27,500.0
35.	Alausa	305	27,500.0
36.	Adekunle Fajuyi	99	52,500.0
37.	Adeniyi Jones	150	32,500.0
38.	Araromi St.	428	8,000.0
39.	Ikeja GRA	1277	53,750.0
40.	Olusosun	5011	19,250.0
41.	Sogunle St.	1070	30,500.0
42.	General Hosp.	743	30,500.0
43.	Allen Av.	1415	106,000.0
44.	Opebi	982	71,250.0
45.	Ogba Estate	858	16,666.7
46.	Adeniji St.	285	20,000.0
47.	Aguda Ogba	730	17,666.1
48.	Ijaye	1078	7,000.0
49.	Ojodu	1022	9,000.0
50.	Alagbado	2235	6,333.3
51.	Ipaja	6899	6,658.3
52.	Oniwaya	4027	7,357.1
53.	Agege Bye-Pass	2009	5,000.0

Source: Valuation Office, Ikeja, Lagos; Field Work, 1993

Ikeja G.R.A., Allen Avenue and Opebi. The variations in house values by zones are more distinct than house values by communities and local governments because the areas covered are very small. The house values in Ikeja by zones is #106,000, the values by communities in Ikeja is #90,000 and the values by local government in Ikeja is #71,250. That is, the house values in the zones are more than the house values in the communities and local governments because the number of houses covered in the zones are fewer and the data are most disaggregated. The grouping of the zones with similar house values also help to identify the housing submarkets that exists in the metropolitan Lagos. This issue is discussed in chapter six. The variation in housing values in table 5.4 could also be due to differences in socio-economic characteristics of the households. As some areas have very high values while others very low values. Areas like Ikoyi, V.I. and Ikeja G.R.A. which are high income areas could not be compared with Surulere, Yaba and Ilupeju which are medium income areas, and also Mushin, Oshodi and Oyingbo which are low income areas. The characteristics of the households in these zones are related to their housing values. This necessitated the grouping of the zones with similar housing values by non hierarchical grouping technique in the next section.

5.3 SPATIAL DIMENSION OF HOUSING SUBMARKETS

There is evidence that the variation over space are better studied by the zones defined by the estate valuers. The pattern is not too clear and there are questions to be answered in this section. The questions are: can the zones be grouped to produce spatial markets? are these submarkets meaningful geographically? In order to answer the questions, there is need to group the zones on the basis of house values and their attributes. We shall use the non hierarchical techniques of grouping. Multivariate grouping techniques are based on the use of orthogonal dimension of variables. Consequently, we shall use factor analysis to produce these dimensions from the set of variables. The variables are shown in table 5.5. Therefore, we first examine the factor scores of the house values and later discuss the non hierarchical techniques of grouping. The results of the grouping of clusters will provide better explanation to issue of submarkets in chapter six.

The spatial variation of housing values in metropolitan Lagos involves the groups of variables of the attribute matrix (35 in all) described in the last chapter were subjected to a factor analysis from which emerged three dimensions. The three dimensions explained a total of 62.4 percent of the variance contained in the original variables. The first dimension,

Table 5.5 ROTATED FACTOR LOADING ON SPATIAL STRUCTURE OF HOUSING VALUES IN LAGOS METROPOLITAN AREAS

VARIABLE	1	2	3
OCCUP	0.496	0.361	0.144
INCOME	-0.116	0.899	-0.078
EDUCQ	-0.024	0.908	0.080
NPERS	0.292	0.719	0.082
NROOM	-0.005	0.912	0.021
PWORK	0.322	0.607	0.268
TCOST	0.218	0.743	0.018
TAREC	-0.019	0.819	0.090
PEOPLE	0.476	0.152	0.428
AREA	-0.098	0.733	-0.083
HRENT	-0.274	0.669	-0.192
BUILD	0.402	0.361	0.182
HAPP	0.766	0.043	0.169
MAINT	0.775	-0.019	0.095
PTRANS	0.636	0.053	0.160
PARK	0.633	-0.046	0.198
ELECT	0.271	0.081	0.460
FLOOD	0.195	0.100	0.063
KITCHEN	0.849	0.043	0.010
TOILET	0.822	0.026	0.151
BATHS	0.828	0.062	0.115
REFUSE	0.632	0.097	0.208
CRIME	0.190	0.183	0.123
NOISE	0.636	-0.042	0.192
DRAIN	0.546	-0.171	0.413
WATER	0.388	0.039	0.704
ROAD	0.361	0.117	0.756
POLLUT	0.344	-0.040	0.190
POLICE	0.177	-0.199	0.004
RECREAT	0.548	-0.010	0.488
PRISCH	0.118	0.034	0.191
SECSCH	0.064	0.102	-0.130
PUBHOSP	0.091	0.012	0.179
PCLINIC	0.178	-0.151	0.104
ASHOP	-0.057	-0.020	-0.011

Note: Definition of Variables as in Table 4.1

Table 5.6 Dimensions of House Values in Metropolitan Lagos

	1	2	3
Eigen Values	10.275	5.808	2.289
% Total	29.4	16.6	16.4
Cummulative %	29.4	46	62.4

which dominates the housing values of metropolitan Lagos accounts for 46 percent of this explained variance while the other two components explain 16.6 and 16.4 percents respectively (see Table 5.6). The factor loadings show the extent to which each variable belongs to or is mostly associated with the factor, while the factor scores show the performances of the cases on the factors.

The first component is characterized by high positive loadings on the neighbourhood and structural variables and rather low positive loadings on locational attributes. The high positive loadings are on number of kitchen, toilet and bathroom facilities; maintenance of the building; good appearance of the neighbourhood; number of parking facilities; the noise level and number of waste disposal system in the neighbourhood (see Table 5.5). The interpretation of this factor is facilitated by the pattern of scores shown in table 5.7. It is a structural/ neighbourhood dimension. This dimension of housing values divides the city into three important socio-economic groups; the high income, the middle income and the low income. The high income is made up of Ikoyi Park, Alagbon, Falomo, Bar Beach, Eleke Crescent, Maroko, Maryland, Ajao Estate, Allen Avenue, Opebi, Ikeja GRA and Adekunle Fajuyi Street. This zones have factor scores ranging between 1.0 and 1.5. The middle income group, on the other

Table 5.7 Zonal Factor Scores on the Dimensions of Housing Values in Metropolitan Lagos

Zone	Descriptions	1	2	3
1	Marina	1.063	-1.078	-0.975
2	Oba's Palace	0.681	0.590	1.915
3	Simpson Street	-0.692	-0.675	-1.720
4	Alagbon	1.259	1.754	0.754
5	Ikoyi Park	1.430	1.896	0.915
6	Falomo	1.120	1.534	0.847
7	Bar Beach	1.351	-1.630	0.533
8	Bleke Crescent	1.456	1.879	-0.682
9	Maroko	1.560	1.923	-0.735
10	Iponri	0.425	0.575	1.830
11	Oyingbo	0.350	0.492	1.745
12	Yaba	0.890	0.975	0.980
13	Abule Ijesha	0.315	0.493	1.450
14	Ijora	0.250	-0.470	1.615
15	Apapa Ajegunle	0.520	0.697	-0.980
16	Masha Road	1.213	1.633	0.115
17	Oju Blegba	0.250	0.457	-0.620
18	Aguda	0.315	0.528	1.115
19	Ijesha Tedo	-0.350	-1.210	-1.220
20	Orile Iganmu	0.415	0 606	1.413
21	Igbobi	0.968	1.213	-1.008
22	Akoka	-0.310	-0.453	1.716
23	Maryland	1.120	1.534	0.815
24	Ketu	0.290	0.375	1.530
25	Ilupeju	-0.954	0.997	0.957
26	Idi Araba Road	0.340	0.395	1.950
27	Itire Road	-0.105	0.450	1.777
28	Ajao Estate	1.010	1.575	0.687
29	Isolo	-0.210	0.473	1.342
30	Mushin	-0.115	0.399	0.842
31	Oshodi	-0.250	0.560	0.753
32	Awolowo Way	-0.930	1.008	1.230
33	Thomas Okoja	1.140	-1.394	-0.780
34	Agidingbi	0.270	0.507	0.890
35	Alausa	0.915	0.998	1.115
36	Adekunle Fajuyi	1.210	1.513	0.751
37	Adeniyi Jones	1.115	1.415	0.890
38	Araromi Street	-0.280	0.387	0.923
39	Ikeja G.R.A	1.715	-1.650	-0.778
40	Olusosun	0.415	0.637	1.223

Zone	Descriptions	1	2	3
41	Shogunle Street	0.830	- 0.978	1.115
42	General Hospital	0.990	1.214	1.002
43	Allen Avenue	1.450	-1.615	0.830
44	Opebi	1.530	1.832	0.734
45	Ogba Estate	0.995	1.210	0.995
46	Adeniji Street	0.250	0.530	0.852
47	Aguda-Ogba	0.150	0.479	1.452
48	Ijaye	0.263	0.630	1.145
49	Ojodu	0.321	0.915	0.921
50	Alagbado	0.560	0.815	1.021
51	Ipaja	0.490	0.730	0.830
52	Oniwaya	-0.630	-0.815	0.925
53	Agege Bye-Pass	-0.224	0.573	1.114

Source: Field work, 1993

hand, is made up of zones with scores between 0.5 and 0.9 and includes Yaba, Ijesha Tedo, Igbobi, Awolowo Way, Ogba Estate and Ilupeju. While the low income group is made up of Oyingbo, Abule Ijesha, Itire Road, Isolo, Mushin, Oshodi and Oniwaya. These latter zones have low positive and high negative scores -0.6 to 0.4.

The second component loads on socio-economic variables with high positive loadings on such variables as number of rooms, income number of persons in the household and education. Consequently, it may be said that this dimension is socio-economic. The pattern of scores in table 5.7 which include areas like Igbobi, Mainland, Ajao Estate, Thomas Okoya, Opebi and Ikoyi Park shows that the zones are made up of high and medium residential areas.

While the first two components identify both the housing attributes and the socio-economic variables of the city, the third dimension identifies the infrastructural facilities provided in the neighbourhoods. This component, accounting for only 16.4 percent of the variance, loads highly on the condition of the road, drainage, provision of water, electricity, and recreational facilities. This dimension therefore may be described as the infrastructural facilities of urban housing of metropolitan Lagos. The pattern of scores shows that areas such as Idi Araba Road, Olusosun, Aguda-Ogba,

Ijora, Iponri, Oyingbo, and Oba's Palace have high scores and they are high density areas.

The analysis of the spatial variation of metropolitan Lagos could be described in terms of three major dimensions of neighbuorhood/ structural attributes, the socio-economic variables and the infrastructural facilities of variation. While they do not show any discernible spatial variation in terms of being either concentric, sectoral or found in nucleations, they undoubtedly outline the historic develpoment of the city.

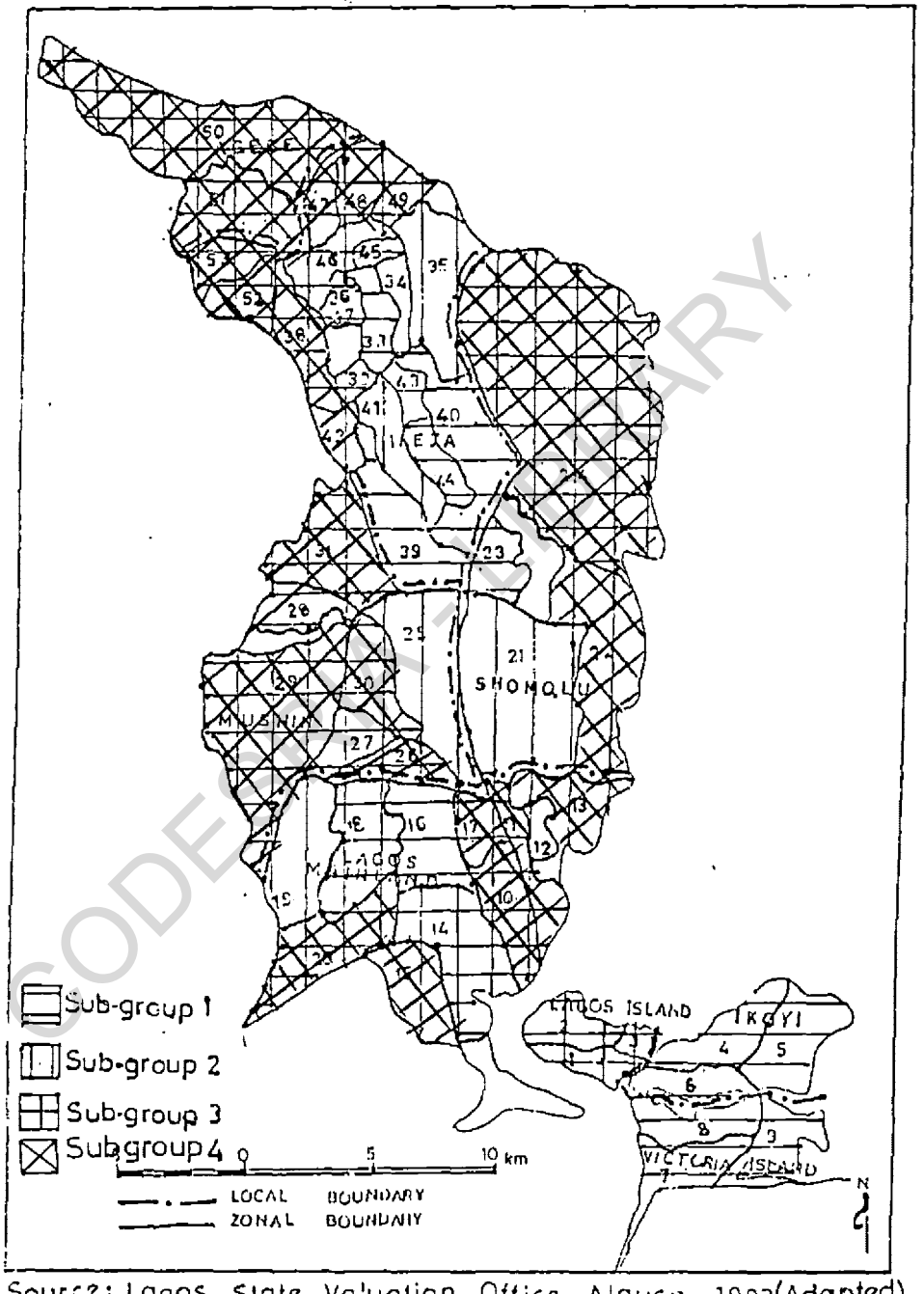
The results of the factor analysis conform with some findings in other parts of the world. Most of the developed and developing countries have traits of this delimitation in their metropolitan areas (Cohen, 1990; Phipps, 1987; Freeman, 1979; Lakshmanan et al, 1978; Mayes, 1979; Ayeni, 1979; Nellis and Longbotton, 1981; Stutz and Kartman, 1982). In United States of America, the process of urban development produced high quality neighbourhoods and community environments for nearly all high income households and middle income households in US metropolitan areas (Downs, 1981). It has also provided reasonably good quality environments for many moderate income households and some low income households. Other works on Singapore, Japan, Korea and Hong Kong confirmed the indicators of housing and neighbourhood quality (Mills, 1972). The most

important point to note is that the behaviour or condition of many urban areas of the world is influenced by locally prevailing culture more than the similarities of objective situations among places - such as overcrowding, poverty and high density.

5.3a Spatial Variation in Housing Submarkets

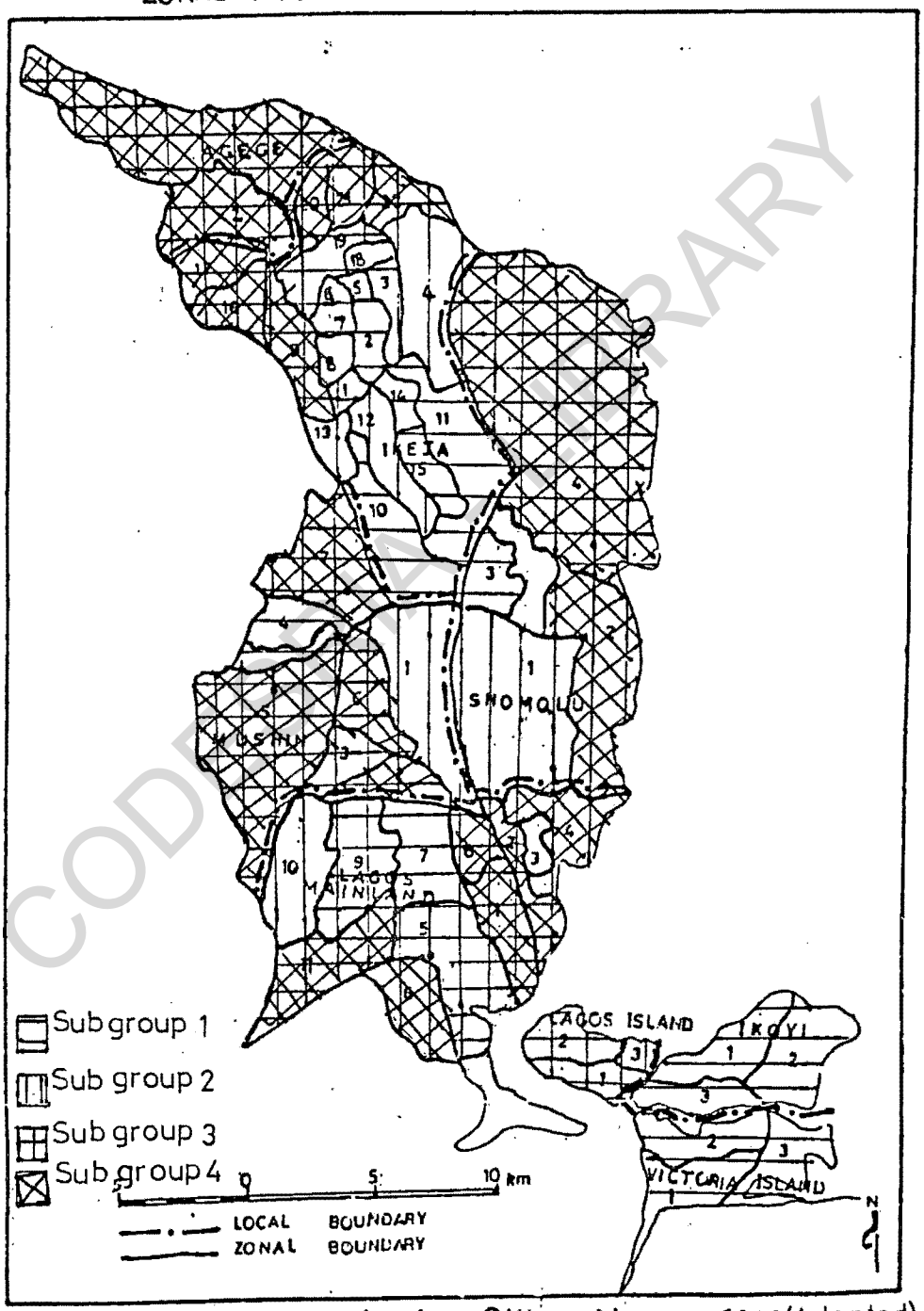
In order to identify similar clusters of zones, the factor scores of the housing values (see Table 5.7) were subjected to non hierarchical techniques of grouping on zonal basis. Four clusters of groupings were identified as four sub-groups and they are shown in figures 5.2 and 5.3. The cluster analysis coincidentally followed the socio-economic groupings as in table 5.8 where high and upper middle income households segregate themselves from low income households. Most high and upper middle income households have strong economic power for legally perpetuating neighbourhood socio-economic segregation. We understand the fact that the different models of residential location believe or explain the spatial pattern of residents according to their income group segregation (Ayeni,1979; Williams,1979). The non hierarchical grouping technique is the most effective in cluster analysis because it makes groupings to be optimal and dissimilar cases are not grouped together.

FIG. 5.2 MAP OF METROPOLITAN LAGOS SHOWING THE ZONAL VARIATION IN HOUSING VALUES SUB-GROUP



Source: Lagos State Valuation Office, Alausa, 1993(Adapted)

FIG. 5.3 METROPOLITAN LAGOS SHOWING THE ZONAL VARIATION IN INCOME SUB-GROUP



Source: Lagos State Valuation Office, Alausa, 1993(Adapted)

Table 5.8 INCOME GROUP OF LAGOS METROPOLITAN WORKERS

Income Group	Income Level Per Annum	Categories of Workers
1. Super High Income	#1.0M - 5.0M	Chief Executive of the Multi-Nationals/ Banks/ Ministers/ Multi-Millionaires
2. Upper High Income	#1.6M - 2.5M	Executive Directors of the Multi-National Companies/Banks
3. High Income	#0.8M - 1.8M	Directors/ Chief Executive of other Companies
4. Super Medium Income	#0.25 - 1.25M	Principal Partners of Professional Firms/ Senior Managers of Multi-National Companies/ Banks
5. Upper Medium Income	#0.15M - 0.5M	Managers in the Banking Sectors/ Multi-National Companies
6. Medium Income	#0.06M - 0.09M	Sub-Managers in the Banking Sector/Multi-National Companies and Managers in other sectors
7. Low Income	#0.025M - 0.035M	Secretaries/Higher Executive Officers etc.
8. Very Low Income	#0.01M - 0.018M	Clerks / Supervisors/ Typists etc.
9. Super Low Income	#0.006M - 0.0084M	Gardeners/ Messengers/ Cleaners etc.

Source: Field Work, 1993

The income grouping in table 5.8 is highly peculiar to Lagos in terms of total pay at the end of the month, especially when the income level is compared with other cities like Ibadan, Kano and Calabar. This could be because of the commercial nature of Lagos except probably in Abuja and Port Harcourt. A comparison with earlier studies on these cities (Arimah, 1990; Megbolugbe,1989,1991; and Ayeni,1991) easily confirms this belief. Therefore, neighbourhoods are naturally demarcated by the quality of the housing units, their environment and the quality of the facilities in general. It is the grouping of zones with the same and related housing attributes as analysed by the non hierarchical technique that forms the identified housing submarkets or socio-economic groups in tables 5.9 and 5.10.

In the first cluster group, the areas comprised of high quality neighbourhoods and community environments. The buildings are usually well maintained, neighbourhood facilities provided and in essence command high value. The areas are of low density and well planned. Some of them are Victoria Island, Ikoyi, Ikeja GRA, Allen Avenue, Opebi and Lekki Peninsula (see Figure 5.2). This is evidenced by the average number of rooms in the sub-group which is 4.6 and average number of persons in the household which is 6.1 in table 5.1. The ratio is about 1:1.3 compared to ratio 1:2.1 in

Table 5.9 Socio-Economic Groups of Income and Rental Values

Sub-groups	Zones	Areas	Mean Income(#)	Mean HRENT(#)
	8	Eleke Crescent	235,000.0	292,500.0
	5	Ikoyi Park	147,000.0	188,000.0
	4	Alágbon	129,600.0	118,000.0
1	9	V.I Annex	186,000.0	255,000.0
	36	Adekunle Fajuyi	90,000.0	52,500.0
	39	Ikeja GRA	71,250.0	52,750.0
	43	Allen Avenue	143,000.0	106,000.0
	44	Opebi	122,500.0	71,250.0
	1	Marina	22,075.6	25,670.0
	7	Bar Beach	186,000.0	253,000.0
	16	Masha Road	38,231.0	16,247.0
	32	Awolowo Way	45,000.0	27,250.0
2	34	Agidingbi	35,000.0	27,250.0
	35	Alausa	32,000.0	27,250.0
	37	Adeniyi Jones	85,000.0	32,500.0
	41	Sogunle St.	58,000.0	30,500.0
	42	General Hosp.	48,000.0	30,500.0
	2	Oba's Palace	18,650.0	14,337.5
	3	Simpson St.	13,266.0	17,700.0
	6	Falomo	86,000.0	11,625.0
	12	Yaba	21,400.0	17,496.0
	14	Ijora	25,840.0	8,528.0
	18	Aguda	18,466.1	15,133.9
	19	Ijesa Tedo	25,550.0	8,375.0
	21	Igbobi	24,815.0	13,500.0
3	25	Ilupeju	22,118.0	10,318.0
	27	Itire Road	21,706.0	12,000.0
	28	Ajao Estate	31,444.0	17,888.9
	23	Maryland	44,000.0	15,040.0
	33	Thomas Okoya	82,500.0	50,000.0
	40	Olusosun	31,000.0	19,250.0
	45	Ogba Estate	40,000.0	16,666.7
	46	Adeniji St.	21,000.0	20,000.0
	47	Aguda-Ogba	23,000.0	17,666.7
	10	Iponri	25,840.0	8,528.0
	11	Oyingbo	31,727.0	4,094.5
	13	Abule Ijesa	28,750.0	7,382.0
	15	Apapa Ajegunle	24,288.0	9,177.0
	17	Oju Elegba	16,320.0	8,300.0
	20	Orile Iganmu	15,325.0	9,000.0
	22	Akoka	22,200.0	7,320.0
	26	Idi Araba Rd.	15,123.1	9,461.0
4	29	Isolo	24,418.2	9,363.0
	30	Mushin	9,600.0	8,500.0
	31	Oshodi	19,244.0	9,055.6
	24	Ketu	20,933.3	7,766.7
	38	Araromi St.	31,000.0	8,000.0
	48	Ijaye	15,866.0	7,000.0
	49	Ojodu	21,300.0	9,000.0
	50	Alagbado	16,050.0	6,333.3
	51	Ipaja	20,355.0	6,658.3
	52	Oniwaya	18,700.0	7,357.1
	53	Agege Bye-Pass	16,314.0	5,000.0

Source: Field Work, 1993

5.10 Socio-Economic Groups of Housing in Metropolitan Lagos

Housing Sub-groups	Zones	Areas
1	8	Eleke Crescent
	5	Ikoyi Park
	4	Alagbon
	9	V. I. Annex
	36	Adekunle Fajuyi
	39	Ikeja G.R.A.
	43	Allen Avenue
	44	Opebi
2	1	Marina
	7	Bar Beach
	16	Masha Road
	32	Awolowo Way
	34	Agidingbi
	35	Alausa
	37	Adeniyi Jones
	41	Sogunle Street
	42	General Hospital
3	2	Oba's Palace
	3	Simpson Street
	6	Falomo
	12	Yaba
	14	Ijora
	18	Aguda
	19	Ijesa Tedo
	21	Igbobi
	25	Ilupeju
	27	Ilire Road
	28	Ajao Estate
	23	Maryland
	33	Thomas Okoya
	40	Olusosun
	45	Ogba Estate
	46	Adeniji Street
	47	Aguda-Ogba
4	10	Iponri
	11	Oyingbo
	13	Abule Ijesa
	15	Apapa Ajegunle
	17	Oju Elegba
	20	Orile Iganmu
	22	Akoka
	26	Idi Araba Road
	29	Isolo
	30	Mushin
	31	Oshodi
	24	Ketu
	38	Araromi Street
	48	Ijaye
	49	Ojodu
	50	Alagbado
	51	Ipaja
	52	Oniwaya
	53	Agege Bye-Pass

sub-group 2 and ratio 1:2.4 in sub group 4 (see Figure 3.5). The exclusion of the lowest-income households benefits the group. It probably will prevent them from encountering the physical discrimination and social maladies often associated with extreme poverty.

The second and third housing sub-groups consist of areas inhabited by upper middle and middle income households. The areas are relatively good with minimum density. Some of them are Falomo, Ijesa Tedo, Ilupeju, Awolowo Way, Ajao Estate, Marina, Masha and Maryland (see Figure 5.2). The average number of roooms is 3 with average number of persons in the household as 6.2 (ratio 1:2.1). Most of the buildings consist of blocks of flats, 2-3 buildings and some multi-purpose/ rooming houses. The buildings are averagely maintained.

The fourth housing sub-group is the low income areas inhabited by low income households. The zones include Oyingbo, Abule Ijesa, Oju Elegba, Isolo, Mushin, Oshodi, Ijaye, Ojodu, Ipaja, Agege and Oniwaya (see Figure 5.2). Most of the areas are noted by their prevailing conditions such as high density (average ratio 1:2.4), poverty, poorly built and maintained houses, unemployment, reliance on public services, crime, vandalism, delinquency, arson, drug addiction, absolute low standard of living, nutrition and sanitation are magnified and come to dominate the entire environment. This kind of

situation has great effect on the housing values in the neighbourhood. For no matter how beautiful and well designed a building could be in Keke area of Agege, Mushin, Ajegunle or former Maroko, it will never command the same value as those in Ikoyi, Victoria Island and Ikeja because of its location. It should be noted that a neighbourhood on smaller scale could comprise of three socio-economic groups. For example in Surulere, the low density area is occupied by high income households, and it is surrounded by medium quality houses occupied by medium income households and then other areas with dilapidated and compressed houses occupied by the low income earners. These three heterogenous socio-economic groups have their boundaries defined by the area up to where the market value of housing noticeably changes or where the mix of housing types or values changes. The greater the similarity of boundaries related to each function, the stronger the neighbourhood.

The above submarkets or socio-economic groupings are further confirmed by table 5.11 which shows the groups average values of the variables. Most of the mean values of the variables decreased from sub-group 1 to sub-group 4. While the yearly mean income in sub-group 1 is N120,668.30 that of sub-group 2 is N50,114.50, sub-group 3 is N33,187.60 and sub-group 4 is N20,101.00. The mean house values also decreased from

Table 5.11 Analysis of Housing Variables for Lagos Metropolitan Socio-Economic Groups

Variable	Sub-group 1 Mean	Sub-group 2 Mean	Sub-group 3 Mean	Sub-group 4 Mean	Overall Mean
INCOME	120668.3	50114.5	33187.6	20101.0	515226.5
HRENT	108928.4	45000.3	17829.5	9032.3	39836.3
NROOM	6.6	4.5	3.0	2.6	3.3
AREA	1698.4	1200.0	1051.0	499.6	963.9
AGE	53.0	52.0	53.0	49.9	51.1
NPERS	6.1	6.1	6.2	6.1	6.1
LAREA	17.1	16.8	16.6	16.5	16.7
LHOUSE	18.5	20.4	20.5	20.1	19.7
TCOST	151.0	900.0	1800.0	1850.0	1713 0
HAPP	0.9	0.8	0.8	0.6	0.7
BUILD	0.8	0.7	0.7	0.6	0.7
TOILET	3.2	2.1	2.0	1.5	2.1
PARK	3.6	2.4	1.3	0.8	1.3
PLAY	3.7	1.6	0.8	0.5	0.8
WATER	0.9	0.9	0.8	0.6	0.7
MAINT	0.9	0.9	0.8	0.6	0.7

sub-group 1 (N108,928.40) to sub-group 2 (50,000), sub-group 3 (N17,829.50) and then sub-group 4 (N10,132.30). The number of rooms occupied by each household (NROOM) followed the same trend.

5.5 CONCLUSION

This study has shown that the use of small geographical scale helped to identify similar zones and neighbourhoods that have the same housing values and socio-economic characteristics. This is unlike some of the previous studies that combined wider areas together and so failed to identify spatial submarkets. Four different geographical scales were examined to determine the level of disaggregation of data, and the highest level of disaggregative data occur where cities are divided into small areas by zones. The variations in house values by zones are more distinct than house values for communities and local governments that bear the same name. This is because the areas covered are very small and the number of properties covered are fewer than the properties in the communities and local governments. The grouping of the zones with similar house values also help to identify housing submarkets that exist in the study area. The submarkets have variations in housing values that conform with the socio-economic characteristics of the households. Some areas have

very high values while others very low values. The analysis revealed that spatial variation of metropolitan Lagos could be described in terms of 3 major dimensions of neighbourhood/ structural attributes, socio-economic variables and the infrastructural facilities.

The classification and identification of spatial areas will help planners, estate surveyors and valuers, government policy makers and other allied professionals in housing to make valuable and quality decisions in the location of amenities/ facilities, ratings of properties and collection of tenement rates, and for proper planning. Areas that need urgent attention because they are inhabited by low income earners will be reconsidered and provided with basic facilities while areas with high income earners could be properly organised to contribute to the provision of essential amenities/ services in their neighbourhoods especially in security services (police stations/ posts).

CHAPTER SIX

URBAN MARKET SEGMENTATION AND HOUSE VALUES

6.1 INTRODUCTION

Housing submarkets are clusters of identical households and housing types in urban areas. These clusters constitute distinct housing submarkets in terms of the price of individual housing attributes. The essence of this chapter is to use the results of previous chapters on how house prices vary by area and the role of changing spatial scale in the identification of housing submarket in cities. That is, how do we examine variations of values over different segmentations of the urban housing market. This chapter therefore shows that different attributes of housing values exists within a city when the city is disaggregated into approximations of housing submarkets. The problem is to examine explanatory variables of submarkets variation of house prices, since different models of residential location explain the spatial pattern of residents according to the housing market structure.

6.2 EXPLANATION OF HOUSING VALUES BY SPATIAL SUBMARKETS IN LAGOS

According to Mẹ́gbolugbe (1983), there are generally four bases for segmenting urban housing markets. They are by tenure, race, geography and type of housing design. Submarkets

by tenure are defined by areas where most of the properties are either owner occupied or rented. While submarkets by race are where settlements are by racial segregation as experienced before in some parts of South Africa, England and United States. Megbolugbe (1983) also believed that the nature of housing market structure in the Third World is different from that of the United States and therefore there is no racial problem in the Nigerian housing market, though there is an ethnic problem. Submarkets by type of housing design are based on whether the concentration of properties in an area are flats, duplexes, bungalows or rooming buildings. While submarkets by geography can also be spatially defined by the concentration of properties of the same relative values in the same area. Such markets are when house values are near uniform and determinants quite similar.

In this study, the emphasis is how to define submarkets by geography. Since the first two definitions are not relevant in the study area (metropolitan Lagos), and the definition by housing type is not of significant importance in all the zones. It is only relevant in some zones like Ikoyi, V.I., Surulere, Ajao Estate and Ikeja where there are specific or common housing designs. Therefore, in line with the results of the previous chapters on how house prices vary by area and the role of changing spatial scale in the identification of

housing submarkets in cities, we arrived at a four broad geographical definition of the housing market in metropolitan Lagos. The first submarket consists of areas like Ikoyi, Allen Avenue, Victoria Island and Ikeja G.R.A. The second submarket with areas of the same house values are Awolowo Way, Agidingbi, Alausa and Adeniyi Jones, while the third submarkets include zones as Oba's Palace, Yaba, Ijora, Masha, Aguda, Igbobi, Ogba and Itire. The fourth submarket comprises of zones as Agege, Ketu, Ojota and Mushin. The zones and the description of the areas in each submarket are presented in table 6.1 and figure 6.1.

In order to explain the submarket variations of the parameters of housing values, we use the hedonic models by regressing housing values on neighbourhood, locational and structural sets of variables respectively. The significant variables are shown in table 6.2b. For the four submarkets and the three sets of variables, the results of the hedonic analysis are given in table 6.2. A look at table 6.2 shows the importance of grouping of distinct zones and the effects of housing attributes on house prices. Table 6.3 shows the mean values of the submarkets housing variables. When the hedonic model is used to analyse the housing attributes in the identified 4 submarkets, there are variations in the results. The first submarket which consists of zones of the same high

income and socio-economic background indicated that the locational attributes accounted for 90.5 percent - the highest variation in annual housing rent. This is followed by neighbourhood attributes (86.5%) and structural attributes (82.1%). The reason could be that the areas were government reservations where location becomes the most important attribute since most of the structures are already known to be masterpieces and of special designs.

The situation in submarkets 2 and 3 are different from submarket 1. In submarkets 2 and 3, structural attributes have the highest variation with 86.7 percent and 83 percent, followed by neighbourhood attributes (67.9% and 58.5%) and locational attributes (66.9%nt and 63.4%) respectively. These results show that the households in the submarkets already know that the areas (locations) are not spectacular in quality but relied on the good nature of the structures and the neighbourhoods they are situated. The last consideration will be how far is the place (house) to place of work and other activities. This, however, determines the house prices. The results are comparable with the overall observations and the F-ratios also confirm the significance of the regression equations.

The submarket 4 also has different results where structural attributes accounted for 77.4 percent as the most

important attributes. Followed by locational attributes with 59.3 percent and neighbourhood attributes (40.6%). Here, the low income households consider first the kind of structures they want to live in, followed by the location of the houses to their activity areas (work, children school, shopping, recreation and worship) and then the kind of neighbourhood it is placed. A neighbourhood might not be important to a low income household who has no option on where he lives and can survive in any neighbourhoods. He can never be selective on where to live like the high income household who has a specific neigbourhood where he wants to live. The R^2 shows that structural attributes (59.3%) accounted for more than twice the values of neighbourhood attributes (21.1%). The F-ratios confirmed the significance of the equations.

We can also see from table 6.2 the relative effects of submarkets and the importance of housing attributes on house prices. The effects of neighbourhood attributes in submarket 1 is more than submarkets 2 and 3, and subsequently higher than submarket 4. This is evidenced by the decrease in the relative importance in the four submarkets from submarket 1 (0.865) to submarket 2 (0.679), submarket 3 (0.585) and submarket 4 (0.460). Also, the locational attributes has the same effects as the neighbourhood attributes in the 4 submarkets, decreasing from submarket 1 (0.905) to submarket

2 (0.666), submarket 3 (0.634) and then submarket 4 (0.593). This shows the importance of these variables (neighbourhood and locational) in the different income submarkets and their importance in the explanation of the spatial variations. However, the structural attributes has highest R^2 in submarket 2 with 86.7 percent, submarket 3 (80.5%) followed by submarket 1 (82.1%), and then submarket 4 with 77.4 percent. This means the effects of structural attributes is highest in submarket 2 than in 3,1 and 4. All these findings are as a result of the changing spatial scale of the zones which show that distinct spatial pattern exist within the Lagos Metropolitan Area. The interpretation is that the significant importance of the variables vary by submarkets. To the low income areas, all the three sets of attributes are unimportant. The importance grows from the characteristics of the submarkets in the middle to the high income areas. This variation can definitely be experienced in other cities where comprehensive perspective of using larger geographic scales are not adopted.

6.2a Locational/Neighbourhood Attributes and Housing Submarkets

In an effort to show the importance of neighbourhood and locational attributes to the explanation of housing values, two housing attributes (locational and neighbourhood) were

combined and analysed. There were 13 significant variables (see Table 6.4). The hedonic analysis showed that the 13 variables gave R = 0.837 and R^2 = 0.700 for all the households. This is an indication that there is a high significant relationship between the spatial attributes and house values, for the variables explained 70 percent of the spatial variation in housing values. Also, the combined variables were analysed on submarket basis. All the submarkets analyses show high explanatory power of the variables. Submarket 1 has R = 0.920 and R^2 = 0.847, submarket 2 has R = 0.743, R^2 = 0.552, submarket 3 has R = 0.800, R^2 = o.640 and submarket 4 with R = 842 and R^2 = 0.709. There is therefore greater impact of the locational and neighbourhood attributes on housing values when they are examined on smaller geographic units.

6.2b Submarkets and Housing Attributes

In order to show the order of importance of the housing attributes and to enable the author compare the results among the hedonic housing traits of locational, neighbourhood and structural attributes, the structural attributes were also analysed. There was a total of 23 variables, 13 are spatial (see last section) and 10 are structural. The latter 10 are the area of land occupied by the building (AREA), number of

rooms occupied by the household (NROOM), number of persons in each household NPERS), number of kitchens in the house (KITCHEN), number of toilet facilities (TOILET), number of bathrooms (BATHS), if water supply is pipe borne (WATER), number of private open space provisions (OPENS), if building is occupied by single household (BUILD), and if appearance of the house is good (HAPP). The total sample has $R = 0.852$ and $R^2 = 0.726$. The structural values are the highest when compared with the other two housing attributes -locational and neighbourhood (see Table 6.2). This means that the structural attributes come first, closely followed by neighbourhood and then locational attributes. The submarkets results of all the housing attributes also follow the overall order of importance of structural, neighbourhood and locational attributes.

These results conform with the previous studies by Mark (1978) and Arimah (1990) in their order of importance. Richardson et al. (1974), however, had different results with neighhourhood attributes emerging the most important group of attributes explaining housing values and then followed by locational and structural attributes respectively. Sumka (1979) and Megbolugbe (1983) only compared two housing attributes (structural and neighbourhood) with structural attributes being the more important variables. But as earlier observed, most of the socio-economic characteristics are

examined and regressed under structural attributes and this gives the structural attributes most explanatory power over other attributes. The reasons for the differences in research findings could be linked to the choice of variables or spatial variation in relative importance of variables in the study areas. The prevailing environmental conditions could also influence the choice of variables.

However, there is an improvement in the explanation of the housing submarkets and in the procedure of analysing the results from the previous works. The difference is based on improper definition and delineation of housing submarkets by Arimah (1990). In his work, Arimah (1990) defined urban submarkets in terms of neighbourhoods that radiate from city centre to urban peripheries. He thus combined distinct spatial units to constitute income sub-group. By doing this, variation over space were masked and so the influence of urban housing submarkets could not be identified. This work has resolved the identified gaps by the use of spatial scale for delineation of submarkets. It also used the smaller scale to bring out distincts homogeneous areas that account for spatial variation in the demand for neighbourhood attributes.

6.3 DETERMINANTS OF HOUSING VALUES IN SUBMARKETS OF LAGOS

In this section, we will only be concerned with all

housing attributes in each of the different submarkets as they affect housing values. Separate hedonic regressions were estimated for each submarket using all the significant variables. The procedure here uses the stepwise approach to enter variables in order of significance. Six predictor variables were entered. Table 6.5 shows the order of importance and proportion of the variance explained by each of the predictor variables on submarket basis. Table 6.6 presents the overall interpretation of the regression model on submarket basis.

In table 6.5, the first submarket has only four variables entered as significant variables. They are, in order, income, length of stay in the house, number of persons in the household and number of rooms occupied by household. Education and age are not entered and therefore not significant. Income is again the most significant independent variable explaining house values and has multiple regression coefficient of 0.770, and coefficient of determination R^2 of 0.593. This implies that income variable explains 59.3 percent of the total variation. The four variables entered have R = 0.882 and R^2 = 0.780, which means that as far as the submarket 1 is concerned, the four variables determine to a large extent the housing values of the area.

Submarkets 2 and 3 also have only three variables entered

on stepwise regression method in the order of income, number of persons in the household and the number of rooms occupied by household. Income is the most significant variable with R = 0.634 and R^2 = 0.402. Although income and the two other variables contributed less than the values in submarket 1 (R = 0.703, R^2 = 0.494), it is an indication that there are spatial variations in different parts of the city. When smaller scale is used, as considered in chapter five, many neighbourhood variations are identified. The submarket 4 also has three variables entered in the order of income, number of rooms occupied and the length of stay in the house. Income in this submarket has R = 0.732 and R^2 = 0.536. The three variables have R = 0.809 and R^2 = 0.655. This implies that the total contribution of the variables in explaining housing values is 65.5 percent.

In all the submarkets, only income and number of rooms occupied by households appeared as the most important variables. These two variables are invariably the most important predictor and significant variables in the overall sample (see Table 6.5). The analysis of variance values of submarket 1 (F = 90.513), submarket 2 (F = 129.055), submarket 3 (F = 132.149) and submarket 4 (F = 140.012) in table 6.6 confirm the significance of the regression equations as an explanatory model.

6.4 CONCLUSION

In conclusion, this chapter has shown the contributions of the housing variables that explains the spatial variation of the housing submarkets. And how each submarket has different price structure of housing attributes in it. The 4 identified submarkets have different house values with different socio-economic background. The variation of the housing attributes over the submarkets confirms the hypothesis that different attributes of housing values exist within a city when the city is disaggregated into approximations of housing submarkets. Also, while housing attibutes are of significant importance to the middle and high income people, emphasis are not on the attributes for the low income people. Furthermore, there is an improvement in the explanation of the housing submarkets and in the procedure of analysing the results from the previous works. Arimah's (1990) improper definition and delineation of housing submarkets was corrected and urban suburbs was not defined in terms of neighbourhoods that radiate from the city centre to urban peripheries. Thus, distinct spatial units to constitute income sub-groups were not combined together and variation over space were identified in the various submarkets. House values determinants in each of the different submarkets revealed that income and number of

rooms occupied by households are the most important variables.

These results are also expected to help valuers, renters, landlords and other professionals to determine what variables they should look for or take note of when obtaining reliable and accurate information on housing units. And more importantly, the findings have given a better understanding of the housing submarkets in various neighbourhoods of the metropolitan Lagos. This no doubt can be applied to other urban centres in Nigeria and other nations that have the same socio-economic and cultural background.

CHAPTER SEVEN

THE EFFECTS OF RELATIVE UNITS OF HOUSING ATTRIBUTES ON HOUSE PRICES

7.1 INTRODUCTION

We have in the previous chapters examined how house prices vary by area and the role of changing spatial scale in the understanding of housing values. We also examined variations of values over different segmentations of the urban housing market and show how each submarket has different price structure of housing attributes. Nevertheless, we have not adequately evaluated the relative units of contributions of housing attributes on house prices, i.e. examine the changes in house prices brought about by a unit increase in housing variables. This chapter therefore evaluates the effects of relative or specific contributions of housing attributes on house prices through the expansion method. Since the expansion method can be used to quantify the variables that mostly affect and contribute to the housing values, the problem is to show how prices structure can be defined within the already identified variables. The expansion method outlines a routine for creating or modifying models made of a sequence of clearly identified logical steps. It therefore provides an alternative approach to an empirical investigation of the effects of

housing attributes on house prices.

7.2 MEASUREMENT OF THE EXPLANATORY VARIABLES

The expansion method has been used in numerous geographical applications for constructing and manipulating models for the investigation of parameters across relevant contexts (Can et al,1989; Casetti,1986; Krakover,1983; Pandit and Casetti,1983). But it has not been applied to the explanation of urban housing values. That is, it has not been used in the area of housing to investigate and measure the effects of housing attributes on housing values.

In the selection of variables for the expansion method, the variables that were considered to be very important predictors of the variation of house prices were selected. The selections were based on the stepwise regression model applied in the previous chapters on the housing attributes. In the practical application of the expansion method, researchers have the responsibility of choosing the most appropriate variables that would help in achieving their set goals.

According to Casetti (1986, 1990, 1991), there are two sets of variables which are denoted by X and Z. The dependent variable is the house rental values which is denoted by Y. The first six variables which represents X_1 - X_6 are: the monthly income of the head of household (INCOME), number of rooms occupied by house hold (NROOMS), area of land occupied by the

building (AREA), type of people living in the neighbourhood (PEOPLE), monthly transport cost of household (TCOST), and the type of building occupied by the household (BUILD).

The income variable was selected as it was shown to contribute significantly to the explanation of housing values in the various socio-economic groups. Housing rental values is a function of the income level of household. Also the number of rooms occupied by household is an important variable in the neighbourhood population density. While high income group occupy more rooms than households in the low income group, the geographical implication is that the low income neighbourhoods are always overcrowded and results to neighbourhood externalities like high level of noise generated by the residents from the various small shops and petty traders. Their effects on housing values are of paramount importance.

The area of land occupied by a building determines the floor size of the building and the income level of home owners. While most buildings in the high income group occupied larger areas, the low income areas are of smaller size but with more concentration of buildings. Therefore in other to determine the effects of housing attributes on housing values, various buiding areas occupied are of significant importance. Also, the type of people living in an area is a function of

the socio-economic status of the people. While distinct neighbourhoods have different categories of residents, it is important to note that the type of people living in the different neighbourhoods will determine the prevailing condition of the houses (whether badly or well maintained, overcrowded and densily populated) and the level of the infractructural facilities. There is a strong relationship between the type of people in a neighbourhood and the house rental value.

Monthly transport cost of the households is another important housing variable which has to do with the amount spent on transportation especially to the place of work. While the high income group tends to live in any part of the city where their comfort is guaranteed, the low income group always likes to live very close to their working place. The yearly or monthly transport cost therefore has effects on the income groups/ classes of the households and eventually on the amount they could afford as rent on houses. The last variable selected for the X variables is the type of building occupied by the household. While flats, bungalows and duplexes are normally occupied by high income households, tenement buildings and rooming houses are mostly afforded by the low income group. It is therefore necessary to investigate the effects of the type of building on housing values.

The second set of variables denoted by Z are only used to define the parameters of the initial model into linear functions of the Z variables in the expansion equation. The Z variables are also variables that should be of importance and could contribute significantly to the explanation of the variation in housing values. The selected six Z variables are total number of persons in the household (NPERS), the room size (ROOMS), area of place of work (PWORK), if the house is well maintained (MAINT), education of the head of household (EDUCQ), and if the water supply is pipe borne (WATER).

The number of persons in the household is an important variable in determining the density of neighbourhoods when divided by the number of rooms occupied by the households. The housing values in various neighbourhoods are functions of the population density of the households. The number of persons in the household variable has been selected to enhance the investigation of the effects of housing attributes on housing values. Another Z variable is the room size. The large room sizes are peculiar to the high income areas which have gigantic buildings in duplexes and bungalows. The rooming houses are always built to minimum standards, so the rooms are of average sizes. The location of workplace is selected because households tend to live very close to where they work. The belief by some researchers (Megbolugbe, 1983; Arimah,

1990) that annual housing values increase away from the 'physical' centre of the city could not be substantiated in the metropolitan Lagos. The average rental values in some zones in Ikeja (zones 36,39,43,44) are known to be more than the average rental values in Lagos Island (zones 1,2 & 3) and Lagos Mainland (zones 10-31) as shown in table 5.4. Also, the low housing value areas are not basically confined to the central sectors of the metropolitan Lagos as experienced in the city of Ibadan by Arimah (1990). Even though households still work or transact business with the CBD of Lagos (Lagos Island), the percentages as presented in tables 4.7a & b could not show too much importance of the CBD. Therefore in order to investigate the effects of location of workplace, the variable is included.

The level of house maintenance is another Z variable. If the house is well maintained, it is measured as one otherwise it is zero. The maintenance of the houses in the different neighbourhoods varies. While the well planned neighbourhoods have their houses well maintained, the clustered and the low income areas are always badly maintained. The amount of money a household is ready to pay for a house is always affected by the prevailing condition of the house itself. Therefore, the value a house would command will be determined by the physical condition of the building and the neighbourhood it is located.

The education of the head of household is selected as there is the tendency for highly educated households to be more concentrated in the high income neighbourhoods. This makes the neighbourhood to be well maintained. The last Z variable is the provision of pipe borne water. The variable is included as many houses in Lagos especially in the suburbs are known not to have access to it. And houses with basic facilities including water are known to command high values. The analysis of the variables and their results are explained in the next section.

7.3 INTERPRETATION OF RESULTS

This section presents an empirical test of the hypothesis that the effect of housing attributes on house values is a function of spatial variation in housing characteristics. In operationalising the expansion method, six variables that contribute very significantly to the explanation of the spatial variation in housing values were selected from the correlation matrix as the first sets of variables X_1 - X_6. Another six important variables were chosen as the second sets of variables Z_1 - Z_6 to show their effects. The initial model $Y = f(X)$ represented by a linear relation between a dependent variable Y and X variables is shown as:

$$Y = f(X) = a_0 + a_1X_1 + a_2X_2 + a_3X_3 + a_4X_4 + a_5X_5 + a_6X_6 \quad (1)$$

and expansion equations defining the parameters of this initial model into linear functions of the Z variables are shown as:

$$a_0 = c_{00} + c_{01}Z_1 + c_{02}Z_2 + c_{03}Z_3 + c_{04}Z_4 + c_{05}Z_5 + c_{06}Z_6 \quad (2)$$

$$a_1 = c_{10} + c_{11}Z_1 + c_{12}Z_2 + c_{13}Z_3 + c_{14}Z_4 + c_{15}Z_5 + c_{16}Z_6 \quad (3)$$

$$a_2 = c_{20} + c_{21}Z_1 + c_{22}Z_2 + c_{23}Z_3 + c_{24}Z_4 + c_{25}Z_5 + c_{26}Z_6 \quad (4)$$

$$a_3 = c_{30} + c_{31}Z_1 + c_{32}Z_2 + c_{33}Z_3 + c_{34}Z_4 + c_{35}Z_5 + c_{36}Z_6 \quad (5)$$

$$a_4 = c_{40} + c_{41}Z_1 + c_{42}Z_2 + c_{43}Z_3 + c_{44}Z_4 + c_{45}Z_5 + c_{46}Z_6. \quad (6)$$

$$a_5 = c_{50} + c_{51}Z_1 + c_{52}Z_2 + c_{53}Z_3 + c_{54}Z_4 + c_{55}Z_5 + c_{56}Z_6 \quad (7)$$

$$a_6 = c_{60} + c_{61}Z_1 + c_{62}Z_2 + c_{63}Z_3 + c_{64}Z_4 + c_{65}Z_5 + c_{66}Z_6 \quad (8)$$

By substituting the right-hand side of the (2), (3), (4), (5), (6), (7), and (8) for the corresponding coefficients in (1) the following terminal model is obtained

$$\begin{aligned} Y = {} & c_{00} + c_{01}Z_1 + c_{02}Z_2 + c_{03}Z_3 + \ldots\ldots\ldots\ldots + c_{06}Z_6 \\ & + c_{10}X_1 + c_{11}Z_1X_1 + c_{12}Z_2X_1 + c_{13}Z_3X_1 + \ldots\ldots + c_{16}Z_6X_1 \\ & + c_{20}X_2 + c_{21}Z_1X_2 + c_{22}Z_2X_2 + c_{23}Z_3X_2 + \ldots\ldots + c_{26}Z_6X_2 \\ & + c_{30}X_3 + c_{31}Z_1X_3 + c_{32}Z_2X_3 + c_{33}Z_3X_3 + \ldots\ldots + c_{36}Z_6X_3 \\ & + c_{40}X_4 + c_{41}Z_1X_4 + c_{42}Z_2X_4 + c_{43}Z_3X_4 + \ldots\ldots + c_{46}Z_6X_4 \\ & + c_{50}X_5 + c_{51}Z_1X_5 + c_{52}Z_2X_5 + c_{53}Z_3X_5 + \ldots\ldots + c_{56}Z_6X_5 \\ & + c_{60}X_6 + c_{61}Z_1X_6 + c_{62}Z_2X_6 + c_{63}Z_3X_6 + \ldots\ldots + c_{66}Z_6X_6 \end{aligned}$$

The regressions of all the variables were computed. At each step procedure, the variable with the lowest t value was removed until all the coefficients of the variables still in the equation were significant at the five percent level or

better. The procedure produced the following linear regression equation:

$$Y = 1.628+0.540X_1+0.259X_2+0.736X_3-0.833X_4-0.202X_5+0.055X_6$$
$$(7.163)\ (4.365)\ (1.801)\ (8.411)\ (-8.188)\ (-2.047)\ (0.633)$$

$$R = 0.873, \qquad R^2 = 0.763$$

where the t values are in parentheses under their respective coefficients. The coefficients of the estimated terminal model were placed in the appropriate locations in the following expansion tableau.

Y	bo	b1	b2	b3	b4	b5	b6
ao	1.628	0.000	0.000	0.000	0.000	0.000	0.00
a1	0.259	0.540	0.259	0.736	-0.833	-0.202	0.055

The results indicate that the parameter a_1 of the initial model specifies the change in house prices associated with a unit increase in the income. Consequently, a_1 represents the 'effect' of income on the house prices. Or that the effect of X_1 on Y is measured by a_1. The house values in the absence of any attributes a_0 is 1.628 percent. The a_5 (Y) function indicates by how much this house values is reduced for each one percent of housing attributes as specified by negative values.

A unit increase in the level of income of the household will bring about 0.540 percent increase in the house rental values. This is an indication that an increment in income does necessarily bring about an upward increase in house values. And this always leads to households changing for either better or worse accommodation depending on the amount they could afford to pay as rent. This invariably may change the location and neighbourhood preference of the household.

The house value per unit of rooms occupied by households is 0.259 percent. This shows that a unit increase in the number of rooms occupied by households will lead to 0.259 percent increase in house values. The higher percentage shown by income over the number of rooms is an indication that the higher the income the more likely the number of rooms the households may want to occupy (if the number of rooms they are occupying is not enough), and the higher the rental values.

The effect of area of land on housing rental values is high. The area of land has been of significant importance in this study. Apart from its significant individual contribution of 50.4 percent to the explanation of house values (see Table 7.1), it shows the effect of increasing the house values by 0.736 percent due to a unit increase in the area occupied by the building. The area of land occupied by the buildings no doubt determines a lot of things like adequate open space,

parking facilities, private recreational area, good ventilation, standard rooms and beautiful environment (when landscapped).

The type of people living in the area is another attribute of housing that enhances the values of houses in specific neighbourhoods. The concentration of well built houses, adequately managed and occupied by high income people in an area tends to give the area a high value. Even low cost housing schemes that have been hijacked by high income people have had their design completely modified and then turned to an expensive area.

Table 7.1 Explanatory Equations for the Effects of Housing Attributes on House Prices

	R	R^2	Beta	t-value	F-value
AREA	0.710	0.504	0.710	37.858	1433.234
INCOME	0.831	0.546	0.288	14.342	1048.730
PEOPLE	0.837	0.700	-0.115	-6.355	818.679
NPERS	0.854	0.730	-0.107	-3.035	472.399
WATER	0.863	0.744	-0.225	-3.623	289.386
BUILD	0.870	0.755	0.389	9.614	123.012
TCOST	0.871	0.761	0.153	6.121	100.073
NROOM	0.873	0.763	0.129	0.805	91.109
N	1410				

* Coefficient not significant at 95 percent confidence level

A variable that earlier showed a significant contribution to the explanation of housing prices is the monthly transport allowance received. In the calculation of its effect on the housing values, it shows a positive effect of 0.202 percent. That is, an increase in the monthly transport allowance received will cause 0.202 percent increase in the distance (location) from the homes to the business centres (especially the city centres). This is true in the sense that increment in transport allowances which affect the gross pay always make people to move to better houses away from the central business district where commercial activities have caused the house rental values to go up. Residents tend to commune from better, cheaper and farther areas to their places of work.

The type of building is another variable that shows its effect on house values. Normally, a duplex or self contained bungalow is expected to rate higher than multi-family houses or storey buildings. This effect on Y is measured by a_6. The low value of 0.055 percent of a_6 is an indication that an increase in number of houses will not actually bring a negative decrease in housing values or reduce the house rental values. New additional buildings will increase the supply of houses but may not necessarily meet the always increasing demand and desire of rentals.

7.4 CONCLUSION

The results have shown the proportion of a unit increase in the variables over house prices. A unit increase in the level of income of the households brought about 0.540% which is an indication that an increment in income does necessarily bring about an upward increase in house values. Also, the higher the income the more the number of rooms the households may likely want to occupy (if the number of rooms they are presently occupying is not enough). Furthermore, the relative unit of contributions of area of land on house values is high. While the variables used have shown their relative effects on housing values, it should be noted that any of the other variables could be selected to examine their significant effects. The expansion method has demonstrated its superior usefulness by showing the relative effects of the variables in addition to their specific contributions to the explanation of housing values. The expansion method can be used to quantify the variables that mostly affect and contribute to the housing values as it has been done above.

CHAPTER EIGHT

SUMMARY AND CONCLUSION

8.1 SUMMARY OF FINDINGS

This study has examined and analysed the relative roles of location, spatial scale and the physical characteristics of houses in the determination of housing values. In achieving this, attempts were made to study how house prices vary by area and the role of changing spatial scale in the understanding of housing values. Thus, the study evaluated the effects of physical properties and the role of neighbourhood attributes in the determination of house prices in different areas of the city; and showed how changing spatial scale of housing attributes leads to identification of housing submarkets in metropolitan Lagos. The study also determined the extent to which these findings help in the understanding of the structure of housing markets in Nigerian cities.

The results of the examination of spatial variations of neighbourhood and locational attributes on house prices showed that there are significant variations in all the explanatory variables. For instance, the yearly income of the household head is noted to be the most significant predictor of the house values and there is a strong association between income and house values. Other important variables are type of people living in the area, area of land occupied, number of rooms

occupied, number of persons in the households, type of buiding occupied, location of workplace and transportation cost. The analysis proved the important role of neighbourhoods in house rental charges. The spatial variations of neighbourhood and locational explanatory attributes confirm the first hypothesis that there are variations in the prices of houses by locations and neighbourhoods. The significant variations in almost all the variables in the different neighbourhoods were attributed to the various locational differences which exist in the housing structures.

The study showed that the use of small geographical areas helped to identify similar zones and neighbourhoods that have the same housing values and similar socio-economic characteristics. This is unlike some of the previous studies that combined wider areas together and so failed to identify spatial submarkets. In order to achieve this, the study utilized four different geographical scales to evaluate and identify the level at which studies of variations of house values become meaningful. It showed that the highest level of disaggregative data occur where cities are divided into small, near homogeneous areas or zones. These variations in house values by zones become more distinct than house values for communities and local governments that bear the same name. The results validate the hypothesis that the spatial scale of

areas of investigation within the cities affects the measurement of housing values.

The grouping of the zones with similar house values also help to identify housing submarkets that exist in the study area. The submarkets have variations in housing values that conform with the socio-economic characteristics of the households. Some areas have very high values while others have very low values. This confirms the hypothesis that households having high socio-economic characteristics occupy highly valued housing units while those with low characteristics occupy housing units with low values. The analysis revealed that spatial variation of metropolitan Lagos could be described in terms of 3 major dimensions of neighbourhood/ structural attributes, socio-economic variables and the infrastructural facilities.

Furthermore, there is an improvement in the explanation of the existence and measurement of housing submarkets. Arimah's (1990) definition and delineation of housing submarkets in terms of neighbourhoods that radiate from the city centre to urban peripheries was corrected. Thus, the study groups distinct spatial units to constitute income sub-groups. Variation over space were then identified in the various submarkets. The determinant of house values in each of the different submarkets revealed that income and number of

rooms occupied by households are the most important variables. The variations of values over different segmentations of the urban housing market showed the contributions of housing attributes. The values showed that each submarket has different price structure of housing attributes in it. The four identified submarkets have different house values with different socio-economic backgrounds. The variation of the importance of housing attributes over the submarkets confirms the fourth hypothesis that different attributes of housing values are required in different housing submarkets to explain the pattern of housing.

The results of our analysis and evaluation of relative contributions of housing attributes to house prices through the expansion method showed the proportion of a unit increase in the variables over house prices. A unit increase in the level of income of the households brought an upward increase in house values. Also, the higher the income the more the number of rooms the households may likely want to occupy (if the number of rooms they are presently occupying is not enough). Furthermore, the relative contributions of area of land on house values is high. Thus, while the variables used showed their relative effects on housing values, the expansion method demonstrated its superior usefulness by showing the relative effects of the variables in addition to their

specific contributions to the explanation of housing values.

8.2 THEORETICAL IMPLICATIONS OF RESEARCH FINDINGS

Different models of residential location expain the spatial pattern of residents according to the housing market structure in metropolitan Lagos. While no one showed any discernible spatial variation in terms of being either concentric, sectoral or found in nucleations, they undoubtedly provide explanations based on the historic development of the city. Athough, the macro-economic theories which involves the urban spatial structure and the ecological approach to urban land values provided a number of elements explaining the location behaviour of households and groups, this study applied the models to housing to explain urban growth according to the choice of residential locations.

Most of the people living in Lagos Island work on the Island, other neighbourhood residents recorded low percentages as those commuting daily with the Island. Most residents work within their areas thereby invalidating the importance of the CBD and emphasising the multi-nuclei nature of the study area.

Existing studies are inconclusive on the extent of externality and there has been little effort to integrate neighbourhood externality into models of urban spatial

structure. The study improved over previous works through a more careful measurement of neighbourhood attributes. The idea that neighbourhood variables are problematic, intangible and difficult to measure objectively could not be sustained. The neighbourhood attributes like pollution, crime, flood, level of security, refuse collection and waste disposal were measured and used to explain the location preferences and behaviours of the households. The results helped the grouping of the zones with similar house values and also to identify spatial submarkets that exists in the study area. This study had successfully examined and incorporated these considerations into models of urban spatial structure to provide an explicit geographical perspective and at the same time made comparisons with other residential location models. The findings should help in a better understanding of the spatial structure of cities in Nigeria.

The range of applications of hedonic calculus in Third World housing market extends only to housing traits pricing, housing quality and housing demand (Arimah, 1990). This study has effectively used the hedonic model to explain the locational and neighbourhood effects on urban housing prices and house values. The issue of spatial scale for proper delineation of sub-groups and proper consideration of neighbourhood variables were adequately treated, especially as

it relates to the measurement and contributions of neighbourhood attributes. The benefits of hedonic model are that they helped to observe changes in market valuations of housing consumption. This means that government policy makers, renters, landlords and other professionals should be able to identify relevant and important housing attributes for neccessary decisions.

This research by successfully using the expansion model therefore advances an alternative approach to the specification and quantification of neighbourhood externalities in the hedonic housing price. The use of the expansion method allows for the quantification of neighbourhood effects, which is important for realtors and planners in their understanding of neighbourhood dynamics.

Urban micro-economic theories (trade-off models) and other alternative operational models offered valuable insight into city structure and the explanation of household location behaviour. The results showed the preferences of individual consumers of housing units that have different impacts on the housing values in different locations and neighbourhoods (housing submarkets). The findings were easily compared with the common assumptions of the western market models. Also, the findings were compared with previous works in other developing countries for their similarities and differences.

In conclusion, we have shown in this research study how the contribution of each structural attribute varied across the urban landscape. Planners, estate valuers and other professionals can make use of special ranking of housing attributes to predict the effects of changing neighbourhood quality on housing prices. In relation to rating and tenement systems, the government could capitalize on the variables contributions for better scientific pricing of houses.

8.3 AREAS OF FURTHER RESEARCH

While the literature measuring externality from occupants on publicly and privately produced environmental good has been burgeoning, little has been said about the extent of neighbourhood effect, measured in price or distance, of non-conforming structures uses, such as commercial or industrial building, on housing. The paucity of evidence on this is surprisingly because the presumed presence of this externality has often been used as the one of the pretexts for zoning regulations (Segal,1979). This area could still be examined for total understanding of the effect of neighbourhood externality on housing.

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Appendix 1

VALUATION SHEET (HOUSES)

LSVO/03

Rating Area: ..... Owner ..... Area of Land .....

Address of Property: ..... Occupier ..... Date of Inspection .....

Main Building

Construction

- Brick
- Conc. Block
- Rein Conc.
- Stone

- Rendered
- Rough Cast
- Face Brick
- Stone

- Age (Year)
- No. of Floors
- Block of Flats
- No. of Flats
- Bungalow
- S/D Houses
- Detac. Houses

Interior

Floors

- Parquet
- Strip
- Grano
- Terrazzo
- Boarded
- Mastic Tiles

Ceiling

- Plaster
- Compo
- Steel
- Boarded

Tiles

- Bathroom
- Kitchen
- W.C.

Roof

- Flat
- Hipped
- Gable
- Mono-Pitched

- Tiles
- C. Asbestos
- C. Iron Sheets
- Concrete
- Slates
- Alum. Sheets

Accommodation/Flat House or Bungalow

- Hall
- Lounge
- Dining Room
- Break Room
- Bedroom
- Study/Dr. Room
- Kitchen
- Pantry
- Bathroom
- Shower
- W.C.'s

Tenement Building

- Bedroom
- Sr./Parlour
- Kitchen

Toilet

- Septic Tank
- Pit Latrine
- Bucket

Services

Water Supply

- Borehole
- Well
- Hand Pump
- Elec. Pump
- Pressure Pump
- Storage Tank
- Rain Water Tank
- Public Supply

- Electricity

Sewerage

- Main Sewer
- Septic Tank
- Bucket
- Pit

Road

- Tar
- Gravel
- Dirt

Design

- V. Good
- Good
- Medium
- Poor

Finish

- V. Good
- Good
- Medium
- Poor

Repair

- Good
- Medium
- Poor

Grounds

- Fences
- Hedges
- Drive

Out buildings

Construction

	Servant's Quarters	Garage	Stores
Brick			
Conc. Blocks			
Re Conc.			
C. I. Sheets			
C. Asbestos			
Tiles			
Alum Sheets			
Trafford Tiles			
Rendered			
Rough Cast			
Conc. Floor			
Pitched Roof			
Mono-P. Roof			

Accommodation Out Buildings

- Rooms
- Kitchen
- Garage
- Store
- W.C.
- Shower
- Pit Latrine
- Septic Tank
- Main Sewer
- Electricity
- Age (Year)

Rental Information .....

Name of Officer making Survey *Signature*

Remarks

VALUATION AT BACK

Appendix 2

UNIVERSITY OF IBADAN
DEPARTMENT OF GEOGRAPHY
Questionnaire on the Location and Neighbourhood Effects on Urban Housing Values: Case Study of Metropolitan Lagos

Houses and Households Survey

1st Part

1. Area in the City.....
2. Zone.....
3. Address of Property.....
4. Age of Head of Household.....
5. Sex of Head of Household.....
6. Marital Status .....
7. Occupation of Head of Household.....
8. Monthly Average Income.....
9. Educational Qualification .....

9b Number of years spent in school.....

10. Total Number of Persons in the Household .....
11. Number of Rooms your Household Occupy .....
12. Year Head of Household got to Lagos.....

2nd Part

13. Length of Stay of Head of Household in the House .....
14. Length of stay of Head of Household in the Area.....
15. Areas lived before in Lagos.....
16. Area of place of work .....
17. Do you prefer your present house? .....

18. Reasons why you choose to live in your present house ..
    (a) The place is close to my place of work
    (b) The rent is affordable
    (c) The environment is good
    (d) It is the place available to me
    (e) Others

19. Indicate the distance of your house to each of the following actually areas. State actual distance in Kilometres

    (a) Place of work .....
    (b) Your children's school.....
    (c) Place of Shopping.....
    (d) Place of Recreation.....
    (e) Place of Worship.....

20. Amount paid on transport from your house to :

    (a) Place of Work .....
    (b) Your children's school .....
    (c) Place of Shopping.....
    (d) Place of recreation .....
    (e) Place of Worship.....

21. Time spent from your house to:

    (a) Place of work .....
    (b) Your children's school .....
    (c) Place of Shopping.....
    (d) Place of recreation.....
    (e) Place of Worship.....

22. Total Monthly Transport cost of your Household.....

23. Monthly transport Allowance receive.....

24. Mode of Transportation to place of work .....

25. Place of Origin (State) .....

26. Areas of prefered to live in Lagos (within your income)
    .....

27. Type of house you prefer to live in .

(a) Rooming house (b) Flat (c) Bungalow
(d) Duplex (e) Other

28. You live with the Landlord/Landlady? .....

29. Type of people living in your area

(a) Diplomats (b) Business Executives
(c) Senior Civil Servants (d) Middle level officers
(e) Low Income Earners

30. Where were you living before you moved into this house?

(a) Another house in the same neighbourhood
(b) A house in another neighbourhood
(c) Another town/village

31. When you look at the condition of your house and your environment, how would you evaluate them using the following variables? Please circle the appropriate indicator when rating and indicate the number of facilities provided where applicable.

Indicators

1. Very Good 2. Good 3. Poor 4. Very Poor

1	Appearance of the house	1	2	3	4
2	Maintenance of the house	1	2	3	4
3	Condition and Appearance of the area	1	2	3	4
4	Comfort and Convenience of the house	1	2	3	4
5	Frequency of water supply	1	2	3	4
6	Provision of parking facilities	1	2	3	4
7	Regularity of electricity	1	2	3	4
8	Flooding in your neighbourhood	1	2	3	4
9	Condition and quality of Kitchen facilities	1	2	3	4
10	Condition and quality of toilet facilities	1	2	3	4

11	Condition and quality of bathroom facilities	1	2	3	4
12	Frequency of refuse/garbage collection	1	2	3	4
13	Cost paid on refuse collection	1	2	3	4
14	Accessibililty to the house	1	2	3	4
15	The general appearance of the neighbourhood (the neighbourhood scape)	1	2	3	4
16	The cleaning of the surrounding	1	2	3	4
17	The feeling of security	1	2	3	4
18	Incidence of crime	1	2	3	4
19	The noise level	1	2	3	4
20	Attitude of people to you	1	2	3	4
21	Drainage condition	1	2	3	4
22	Accessibility to neighbourhood facilities (e.g. schools, markets, etc)	1	2	3	4
23	Provision of waste disposal system	1	2	3	4
24	Source of water supply	1	2	3	4
25	Condition of the road	1	2	3	4
26	Provision of playground for the children	1	2	3	4
27	Location and access to market	1	2	3	4
28	Interpersonal relations	1	2	3	4
29	Reputation of the area	1	2	3	4
30	The beauty of the area	1	2	3	4
31	The general condition of the atmosphere/air pollution	1	2	3	4
32	Availability of public transport	1	2	3	4
33	Comfort and convenience of public transport	1	2	3	4

34	Employment opportunity	1	2	3	4
35	Police Protection	1	2	3	4
36	Personal security and safety	1	2	3	4
37	Size of Rooms	1	2	3	4
38	Number of Bedrooms	1	2	3	4
39	Rent charged	1	2	3	4
40	Provision of private open space	1	2	3	4
41	Provision of recreational facilities	1	2	3	4
42	Availability of Nursery/Pry School	1	2	3	4
43	Condition of Nursery/Pry School	1	2	3	4
44	Availability of Secondary School	1	2	3	4
45	Condition of Secondary School	1	2	3	4
56	Accessibility to public hospitals	1	2	3	4
47	Provision of private clinics	1	2	3	4
48	Access to shopping centres/local shops	1	2	3	4

Appendix 3

Table 5.1 HOUSE RENTAL VALUES

ANALYSIS OF VARIANCE BY

	LAGOS ISLAND	IKOYI	VICTORIA ISLAND	LAGOS MAINLAND	SOMOLU	MUSHIN	IKEJA	AGEGE	OVERALL
Occupation	57.8357 (0.000)	15.0699 (0.015)	6.6406 (0.0145)	44.9147 (0.000)	112.8589 (0.000)	23.7892 (0.000)	3.1403 (0.0159)	13.0833 (0.000)	52.0749 (0.000)
Monthly Income	11.3056 (0.000)	20.444 (0.000)	-	18.7880 (0.000)	91.7272 (0.000)	75.3250 (0.000)	25.5815 (0.000)	38.2809 (0.000)	485.3221 (0.000)
Educational Qualification	42.3214 (0.000)	11.4139 (0.000)	0.5543 (0.462)	18.3698 (0.000)	46.8616 (0.000)	91.1801 (0.000)	17.6060 (0.000)	33.4352 (0.000)	217.2319 (0.000)
Total No. of Persons in the Households	7.2269 (0.002)	3.0200 (0.060)	5.4141 (0.093)	102.2822 (0.000)	143.0250 (0.000)	81.0161 (0.000)	15.0108 (0.000)	66.3540 (0.000)	31.0576 (0.000)
No. of Rooms Occupied by Households	21.3267 (0.000)	10.6289 (0.000)	*.6037 (0.553)	50.4456 (0.000)	169.0972 (0.000)	65.0282 (0.000)	44.4844 (0.000)	46.8954 (0.000)	237.2871 (0.000)
Area of Place of work	4.3641 (0.003)	2.8884 (0.354)	12.000 (0.000)	17.6088 (0.000)	65.4688 (0.000)	37.9428 (0.000)	6.2011 (0.000)	7.2668 (0.000)	17.4730 (0.000)
Households Monthly Transport Cost	175.7143 (0.000)	9.4286 (0.000)	4.4444 (0.010)	56.6953 (0.000)	77.9297 (0.000)	126.9598 (0.000)	32.2238 (0.000)	141.3333 (0.000)	44.6330 (0.000)
Monthly Transport Allowance Received	150.4286 (0.000)	*0.5235 (0.669)	7.2281 (0.001)	54.2947 (0.000)	66.7885 (0.000)	62.6187 (0.000)	36.2135 (0.000)	53.000 (0.000)	152.0598 (0.000)
Area of Land	23.2652 (0.000)	13.4105 (0.000)	8.2222 (0.000)	93.9956 (0.000)	76.1080 (0.000)	287.8022 (0.000)	42.4415 (0.000)	73.6703 (0..000)	483.0016 (0.000)
Types of Building	1.6190 (0.154)	1.5382 (0.211)	0.7911 (0.462)	14.0336 (0.000)	4.7744 (0.001)	22.8081 (0.000)	2.0139 (0.095)	6.1782 (0.000)	33.5057 (0.000)
House Appearance	1.9167 (0.155)	4.3306 (0.044)	.5543 (0.462)	7.9486 (0.000)	6.1702 (0.004)	70.3053 (0.000)	*0.5722 (0.634)	2.8699 (0.060)	121.3287 (0.000)

	LAGOS ISLAND	IKOYI	VICTORIA ISLAND	LAGOS MAINLAND	SOMOLU	MUSHIN	IKEJA	AGEGE	TOTAL
House Maintenance	1.0405 (0.3798)	*0.2064 (0.9365)	3.2903 (0.0785)	9.3521 (0.0000)	2.2193 (0.861)	100.1729 (0.0000)	7.8700 (0.0001)	1.5978 (0.2058)	171.3750 (0.0000)
House Comfortability & Convenience	1.3955 (0.2509)	-	3.2903 (0.0785)	1.7760 (0.1709)	7.1112 (0.0001)	91.9929 (0 .0000)	3.1299 (0.0271)	2.1012 (0.1257)	72.3868 (0.0000)
Parking Facilities	4.3125 (0.0172)	5.4957 (0.0250)	0.5543 (0.4617)	2.0916 (0.1251)	*0.2344 (0.7912)	17.0862 (0.0000)	9.7858 (0.0000)	2.1330 (0.1222)	93.0045 (0.0000)
Electricity	3.2545 (0.0437)	5.8980 (0.0197)	-	4.5275 (0.0341)	20.3927 (0.0000)	26.2802 (0.0000)	8.4784 (0.0000)	3.6093 (0.0293)	25.3461 (0.0000)
Flooding	1.0171 (0.3663)	12.0569 (0.0000)	*0.3300 (0.7213)	3.53000 (0.0304)	19.9006 (0.0000)	36.9853 (0.0000)	1.1968 (0.2755)	4.2644 (0.0157)	3.3401 (0.0187)
Kitchen Facilities	2.6090 (0.0594)	15.1795 (0.0004)	5.4141 (0.0093)	1.7322 (0.1785)	6.1530 (0.0005)	35.4108 (0.0000)	1.3561 (0.2579)	4.2850 (0.0154)	64.8715 (0.0000)
Toilet Facilities	1.8233 (0.1499)	12.6175 (0.0010)	*0.1723 (0.6807)	2.8868 (0.0572)	4.6272 (0.0035)	41.8659 (0.0000)	(0.8164) (0.1460)	3.3125 (0.0390)	67.9129 (0.0000)
Bathroom Facilities	5.2436 (0.0024)	12.6175 (0.0010)	3.2903 (0.0785)	3.1537 (0.0440)	6.1530 (0.0005)	41.8659 (0.0000)	1.4549 (0.2286)	7.4949 (0.0008)	60.1277 (0.0000)
Refuse Collection	*0.8812 (0.4558)	2.6082 (0.0875)	9.5114 (0.0043)	2.9727 (0.0525)	10.0582 (0.0001)	8.8461 (0.0002)	1.5338 (0.2186)	2.0143 (0.1368)	9.6702 (0.0000)
Incidence of Crime	3.2545 (0.0437)	20.6363 (0.0000	-	5.4110 (0.0049)	2.7257 (0.0672)	47.2234 (0.0000)	2.7025 (0.0698)	3.7842 (0.0248)	7.8176 (0.0000)
Noise Level	14.2500 (0.0742)	1.3262 (0.2583)	-	3.3195 (0.0374	4.0400 (0.0186)	6.3870 (0.0019)	23.4952 (0.0000)	1.8513 (0.1604)	93.0702 (0.0000)
Drainage Condition	2.7109 (0.0742)	49.8701 (0.0000)	1.2439 (0.2925)	1.0926 (0.3366)	2.6033 (0.0760)	4.3587 (0.0051)	9.6258 (0.0001)	*0.6768 (0.5097)	78.2980 (0.0000)

	LAGOS ISLAND	IKOYI	VICTORIA ISLAND	LAGOS MAINLAND	SOMOLU	MUSHIN	IKEJA	AGEGE	TOTAL
Source of Water Supply	2.5525 (0.0841)	15.4339 (0.0003)	0.5543 (0.4617)	2.4542 (0.0875)	12.2341 (0.0000)	10.2328 (0.0001)	6.8277 (0.0014)	3.0361 (0.0510)	33.9371 (0.0000)
Road Condition	2.6667 (0.0533)	49.8701 (0.0000)	3.2903 (0.0785)	10.2694 (0.0000)	1.6079 (0.2024)	40.9596 (0.0000)	6.8161 (0.0014)	5.3729 (0.0056)	33.3768 (0.0000)
Atmospheric Protection	*0.2118 (0.8097)	-	-	5.6986 (0.0037)	22.0666 (0.0000)	12.1489 (0.0000)	21.5765 (0.0000)	2.4478 (0.0897)	74.8565 (0.0000)
Police Protection	*0.2721 (0.8453)	29.8447 (0.0000)	1.2439 (0.2725)	1.5350 (0.2170)	6.9339 (0.0012)	4.5340 (0.0115)	7.3596 (0.0009)	1.2997 (0.2755)	73.1676 (0.0000)
Recreational Facilities Provision	1.7531 (0.1812)	-	*.0000 1.0000	3.0032 (0.0510)	16.9412 (0.0000)	22.8036 (0.0000)	6.0124 (0.0007)	1.2427 (0.2774)	116.0529 (0.0000)
Nursery/Primary School	3.2545 (0.0437)	20.4441 (0.0000)	1.5968 (0.2178)	2.1046 (0.1235)	-	-	9.8467 (0.0001)	1.0306 (0.3116)	6.2258 (0.0003)
Secondary School	*0.7925 (0.4562)	15.3382 (0.0000)	3.5357 (0.0406)	2.2281 (0.1093)	4.6525 (0.0103)	.7149 (0.3985)	13.9920 (0.0000)	0.9277 (0.3369)	20.8621 (0.0000)
Access to Public Hospitals	0.8679 (0.4237)	6.8176 (0.0009)	5.6447 (0.0078)	2.5118 (0.0585)	3.5972 (0.0289)	12.6823 (0.0000)	2.9693 (0.0333)	0.9390 (0.3934)	20.7092 (0.0000)
Provision of Private Clinic	1.5422 (0.2201)	1.6241 (0.2099)	11.1562 (0.0020)	2.2446 (0.1350)	9.0261 (0.0029)	-	4.7808 (0.0095)	10.9103 (0.0000)	43.7784 (0.0000)
Access to Shopping Centres	0.8367 (0.3630)	*0.1607 (0.6906)	-	-	5.1071 (0.0246)	-	4.8184 (0.0092)	2.6016 (0.1087)	.6517 (0.5172)

* F- ratio Coefficients not significant of 95 percent confidence Level
F Probability in Parentheses