

**AN ANALYSIS OF SPATIAL PATTERN OF URBAN ACTIVITIES IN A TRADITIONAL
AFRICAN CITY: A CASE STUDY OF ILORIN, NIGERIA**

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ABSTRACT

This paper analyses the spatial pattern of activities of people in Ilorin especially the types, location, spatial pattern, spatial fixity and activity. Data were collected from 500 residents of Ilorin, each of whom completed a time budget diary over one week. Descriptive statistics was used to summarize the data while probability transition analysis was used to analyse the linkages between the activities. The result shows that the activities were fixed in space and that there is no significant linkage between the activities. The study also shows clearly that spatial structure of activity in Ilorin is different from what obtains in Western cities where there is strict zonation in the usage of space

Keywords: spatial pattern, urban activities, traditional African city

INTRODUCTION

One of the factors that distinguish an urban area from a rural area is economic differentiation. Whereas rural areas are dominated by primary economic activities, urban areas are predominantly engaged in secondary and tertiary functions that account for the concentration of people in them. Such secondary and tertiary activities include manufacturing, trading, transportation and other services. All these activities combine to generate the spatial configuration of the city, because their requirements are sometimes functionally differentiated and spatially segregated (Ayeni, 1979). Although urban activities and land use are sometimes spatially segregated, they are functionally linked together through human patronage, human activities, interaction and time.

Studies of urban activities are many in Nigeria (Mabogunje, 1968; Ayeni 1974; 1975, 1979, 1982; Onokerhoraye 1984, 1994, Chokor 1986, Sada, 1986, etc). Most of these studies deal with the prediction of future urban growth based on aggregate data collected on factors such as employment and population growth. They have also attempted (with varying degree of success) to forecast small-scale outcomes based on broad projections using locational models and multivariate methods to derive generalized activity patterns from a large number of variables. Little or no attempt has been made in these studies to examine how the location of these activities can enhance optimality in infrastructure planning in cities.

THE RESEARCH PROBLEM

Series of studies on urban activities and land use in Nigeria in the past few decades, especially concerning predicting urban growth (Mabogunje, 1968; Ayeni 1974, 1975, 1979, 1992; Onokerhoraye 1984, 1994; Chokor, 1986; Ajayi, 1995; Agbola, 1986; etc) are based on the ecological theories of urban land use pioneered by Burgess (1925); Hoyt (1934); and Harries and Ullman (1957). Others have proceeded along the lines of micro-economic theory of urban land value as pioneered by Wingo, (1961) and Alonso, (1964). These studies are of the view that urban land use pattern and the emerging activities are determined by the urban land rent mechanism, which predicts the theoretically perfect site in terms of the trade-off between site rentals and the cost of overcoming the friction of distance (Carter, 1975).

Some of these studies focus on the factors of location taking particular consideration of the effects of large-scale agglomeration of people in cities (Pred, 1967; Logan, 1966; Ayeni, 1979). Other studies took the location of activities as given, and thus dwelt on the inter-relationships among these activities on the one hand; and between them and the areas, which the urban centers, serve on the other. Yet other studies focused on the pattern of spatial interaction pioneered by Ullman (1956) to explain the house-hold propensity to interact in an urban system (Marble;1957,Ayeni,1972).

More recent works on urban activities have been concerned with the distribution of the activities of urban households and how such distributions affect their residential location decisions (Olatubara, 1994^a 1994^b 1996). These studies were based on commuting models (Okpala, 1994; Pacione, 1982). Few studies that have focused on the nature of interaction or inter-relationships between various urban activities focused on locational separation of producers and consumers, the reciprocal relationship between places as explained by the principle of complementarity, intervening opportunity and transferability (Abler, *et al* 1972).

It should be noted that most of these models were derived from North American experiences, thus lacking a deep appreciation of the situation in the developing world. Moreover, the studies on urban growth and its attendant quantification have been of the deductive type involving the collection of voluminous database for every locale that was subjected to statistical manipulations. They have largely failed to account for a variety of forces that shape urban areas. There was therefore the need for other approaches to bridge the gap.

The approach that has emerged has been tagged the Activity Systems Approach (Kwan,2005) which aims to account for behavioral pattern of individuals, institutions and firms that occur in a spatial context. The behavioural approach is a conceptual framework to describe some of the major elements and dynamics of human behaviour as they relate to activities and land use. This is an inductive approach, where the predictions about the whole will be derived from individual instances of behaviour and obtained in the form of disaggregated data. . Against this background, this research intends to examine the spatial pattern of urban activities in a traditional African city in transition.

STUDY AIM AND OBJECTIVES

The aim of this study is to analyse the spatial pattern of urban activity in a traditional African city using Ilorin as a case study with a view to evolving land-use policies that will be effective and sensitive to the needs of the people. This will be achieved through the following specific objectives:

- 1) To identify the activities of the people in the study area.
- 2) To identify the locations of these activities.
- 3) To determine the probability of occurrence of a sequence of activities.
- 4) To draw inference from the study for land use policies for Ilorin and Nigerian urban centers at a similar stage of development.

METHODOLOGY

Types and sources of data

Two main types of data are used in this research. These are the **primary** and **secondary** data. The primary data was obtained from the survey of the full activity spectrum based on Time Budget Diary (TBD) approach. The TBD is the record of the socio-economic attributes and the activities of respondents over a specified time (usually a day or 24hours). A diary questionnaire was prepared that focused on the start and end times, nature and location of each activity and the number and type of participants present (Adedokun, 2009) The secondary data source, especially on the population size of the study area, was obtained from the National Population Commission documents while data on land use and the observed activity was obtained from the Municipal Planning Authorities.

SAMPLING PROCEDURE

This study uses one major type of sampling technique, which is simple random sampling. However, the sampled respondents were chosen because they fulfill the criterion of being literate. The reason for this is that they would not only be able to complete the questionnaire, but they will be able to keep records of their daily activities as required for this study. A sample of 500 (0.06%) was decided upon based on worldwide sample used in Time Budget Diary research. For instance the sample used for a similar study in Halifax in 1980 was 0.06 percent sample, Los Angeles, 2000, 0.06 percent sample while the sample size for Portland Oregon 2003/2004 was 0.03 percent. (Timmermanns, 2000; Kwan, 2005) This sample is considered adequate for the study of this nature because researches involving Time Budget Diary do not accommodate large samples due to complexity of completing the questionnaire, the time and cost involved in administering the questionnaire and monitoring the respondents.

The Neighbourhoods were the existing census and electoral wards in the study area. The use of these wards was based on the fact that it makes it easier to obtain data on population. The 20 electoral wards provide the spatial framework. The 500 questionnaire was distributed proportionally among the wards based on 1991 population census figure and an estimated annual growth rate of 3.5 percent.. This is done by dividing the population of each ward by the total population and multiplies the results by 500. The respondents were picked systematically from 5th house of every 3rd street in each ward.

QUESTIONNAIRE ADMINISTRATION

All the five hundred respondents were issued with seven questionnaire each to cover a whole week; that is from Sunday to Saturday making a total of 3,500questionnaires. The questionnaires were administered such that with the help of field workers, each of the respondents was monitored at home and in the office/work place in order to ensure compliance. The completed questionnaires were retrieved after seven days.

THE STUDY AREA

When the present city of Ilorin was founded is not very clear. Indeed, little is known about its pre-jihad political development. Ilorin is today the capital of Kwara State. It is located on latitude 80.30N and Longitude 40.35'E. It lies on the southern fringes of the savanna region and north of the forest zone. Ilorin is located in the Guinea savanna grassland belt of middle belt region of Nigeria. The main river in Ilorin is the Asa which flows in the south-north direction. It divides Ilorin into two parts: a western part representing the core or indigenous area and the eastern part where the Government Reservation Area (GRA) is located. Ilorin has experienced a rapid growth in its population over the years. The first population census in 1911 put the population of Ilorin at 36,343 while the 1953 population census put the town’s population at 40,994. The 1963 and 1991 censuses recorded the population of the town as 208,546 and 532,088 respectively. The projected population of Ilorin in 2005 when this research was carried out was 748,150 based on an assumed annual growth of 3.5 percent.

MAJOR FINDINGS

Activities of the Respondents

More than 1,000 different types of activities were listed by the respondents, but these activities could be classified into six major types, namely, educational, artisan/technician, commercial, civil service/administration, financial and other services as shown in Table1.

Table1 Occupation of respondents

OCCUPATION	No of respondents			
	Male	%	Female	%
Civil Service	50	15.4	76	23.40
Trading/Business	30	9.20	43	13.20
Artisan/Technician	27	8.30	5	1.50
Professionals	15	4.60	7	2.20
Students	44	13.50	24	7.40
Others	4	1.20	0	0
Total	170	52.30	155	47.70

Source: Field work, 2015.

Of the six activities, those connected with education have the highest number of respondents (56.0%). This comprises both teachers and students in secondary and tertiary institutions. This is followed

by commercial (22.0 percent), artisans/technicians (9.8 percent, civil service/administration (7.38 percent), and other services (3.0 percent) while financial activities recorded the lowest (1.3 percent).

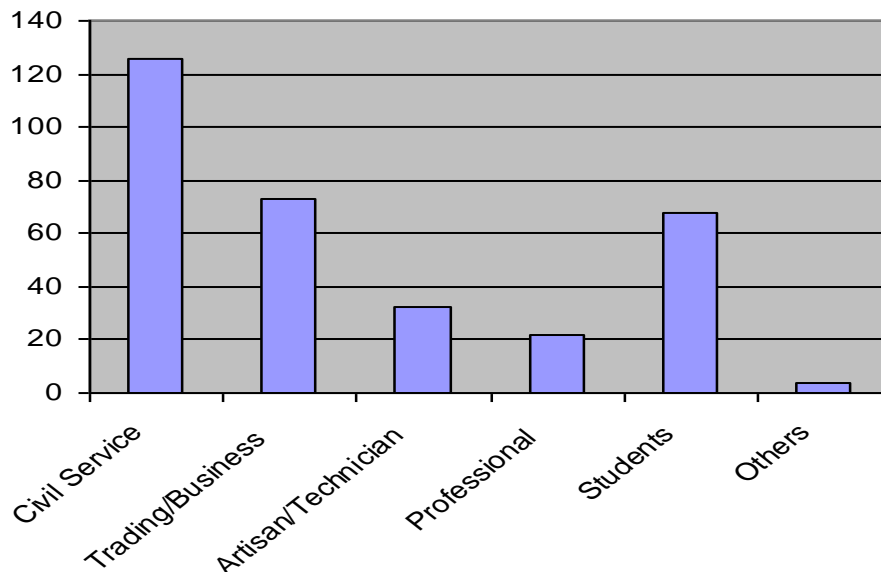


Fig. 1: Occupation of Respondents

Location of Respondents' Activities

The different types of activities that were listed by the respondents were re-classified under three major sub-headings that focused on where the activities took place or where the activities were located or based (Cullen and Godson, 1972; Proccoss and Harvey, 1977; Kwan, 2006). Home based activities in this respect refer to those activities that took place not only inside the houses of the respondents but also within the neighbourhood of the respondents, that do not involve long distance movement. Office/workplace basactivities are those that took the respondents out of their neighbourhood. It involves commuting to and from, using various modes of urban transport while outdoor activities on the other hand, are mainly recreational activities which may or may not take people out of their neighbourhoods. The location of the respondents' activities is almost shared equally between home based and office/work place based activities as shown in Table 2

Table2: Location of Activities

Activity Location	No of respondents	%
Home Based	149	47.5
Office/work place	162	51.1
Outdoor	2	1.4
Total	313	100.0

Source: Fieldwork, 2015.

Table2 shows that the location of the respondents' activities is almost shared equally between home based (47.5%) and office/work place based activities (51.1%) while only 2 respondents (1.4%) engaged in outdoor activities. The reason for this is that outdoor activities is a reflection of affluence, since most of the respondents are low income earners, engaged in informal sector or personal businesses from morning till evening, they rarely have time for leisure activities.

Spatial pattern of Respondents' Activities

Almost all the activities were present in all the wards except financial activity. In terms of spatial distribution of the activities, wards 4, 8, and 14 has the highest concentration of five activities. This is followed by wards 5 and 10 with four activities each while ward 20 had only two activities, that is, educational and commercial as shown in Figure 2

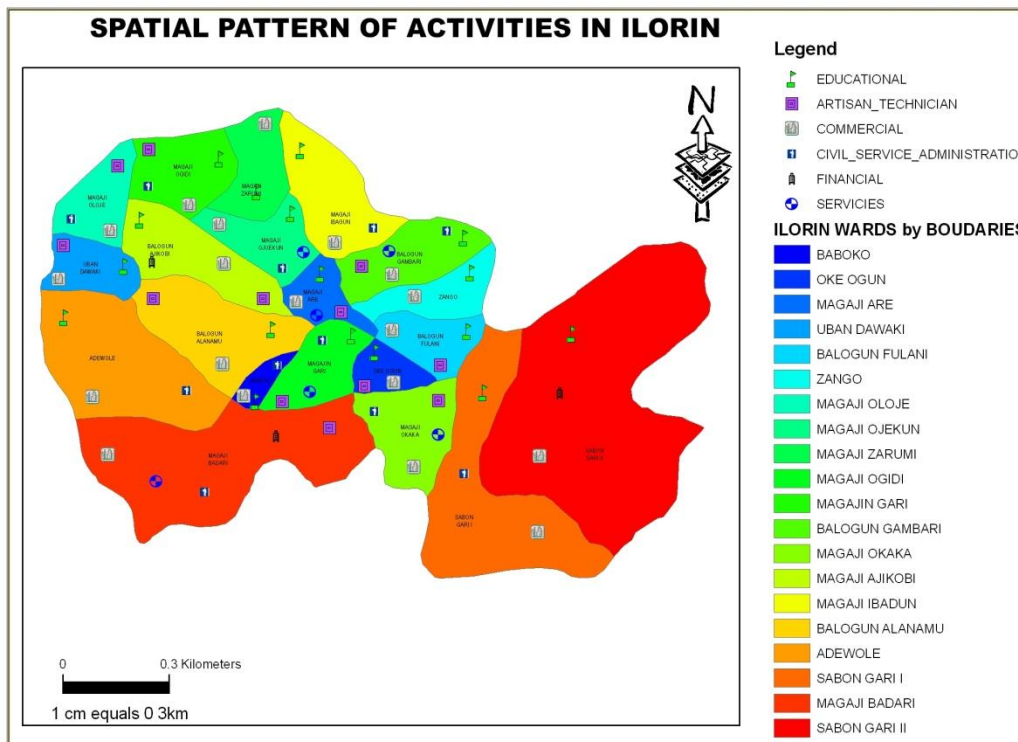


Fig.1: Spatial Pattern of activity in Ilorin

Spatial Fixity of Respondents' Activities

Spatial fixity seeks to establish whether activities were arranged with other people or planned independently, whether they are routine activities or is unplanned or unexpected, that is, the degree of spatial commitment of respondents to activities. In establishing the spatial fixity of respondents' activities, they were asked if they could have done their activities elsewhere or they could have been elsewhere at the time of carrying out a particular activity. The number of respondents that answered this question was 296 (86.80 percent), 28 (9.5 percent) had their activities arranged with others, 4 (1.4 percent) had their activities planned and 264 (89.2 percent) engaged in normal routine activities. The results are presented in Tables 3 and 4

Table 3: Spatial fixity and activity location (a)

Activity type	Could you have done this elsewhere?					
	Yes	%	No	%	Total	%
Home based	20	6.8	112	37.8	132	44.6
Office/work place	2	0.69	160	54.1	162	54.7
Outdoor	—	—	2	0.69	2	0.69
Total	22	7.43	274	91.9	296	100

Source: Field work, 2015.

Table 3 shows that out of 296 valid respondents, 272 (91.9%) had their activities fixed in space i.e. they couldn't have done their activities elsewhere. Out of these, (44.6%) were engaged in home based activities, (54.7%) in office/work place and 2 (0.69%) in outdoor activities. On the other hand, only 22 (7.43%) respondents could have done their activities elsewhere. They were (6.8%) for home activities and 2 (0.69%) for work/office based activities. To further establish spatial fixity of activities, respondents were equally asked if they could have been elsewhere at the time they were to perform their activities. The result is presented in the Table 4.

Table 4: Activity location and spatial fixity (b)

Activity Location	Could you have been elsewhere at that time?					
	Yes	%	No	%	Total	%
Home based	20	6.8	112	37.8	132	44.6
Office/work place	2	1.4	160	54.1	162	54.7
Outdoor	-	-	02	0.70	2	.70
Total	22	7.43	272	91.9	296	100

Source: Field work, 2015.

From the analysis only 22 respondents (7.43%) could have been elsewhere doing their activities. While 272 (91.90%) could not be elsewhere at the time of performing their activities. The breakdown is as follows, 132 (44.60%) who were engaged in home based activities, 162 (54.70%) in office/work place and 2 (0.70%) who were engaged in outdoor activities.

A MODEL OF URBAN NEIGHBOURHOOD ACTIVITY CENTRES

Based on the above findings in the study area, we would like to construct a generalized model of land use planning and facility location in a traditional medium size urban center using Ilorin as a case study. (Fig. 3)

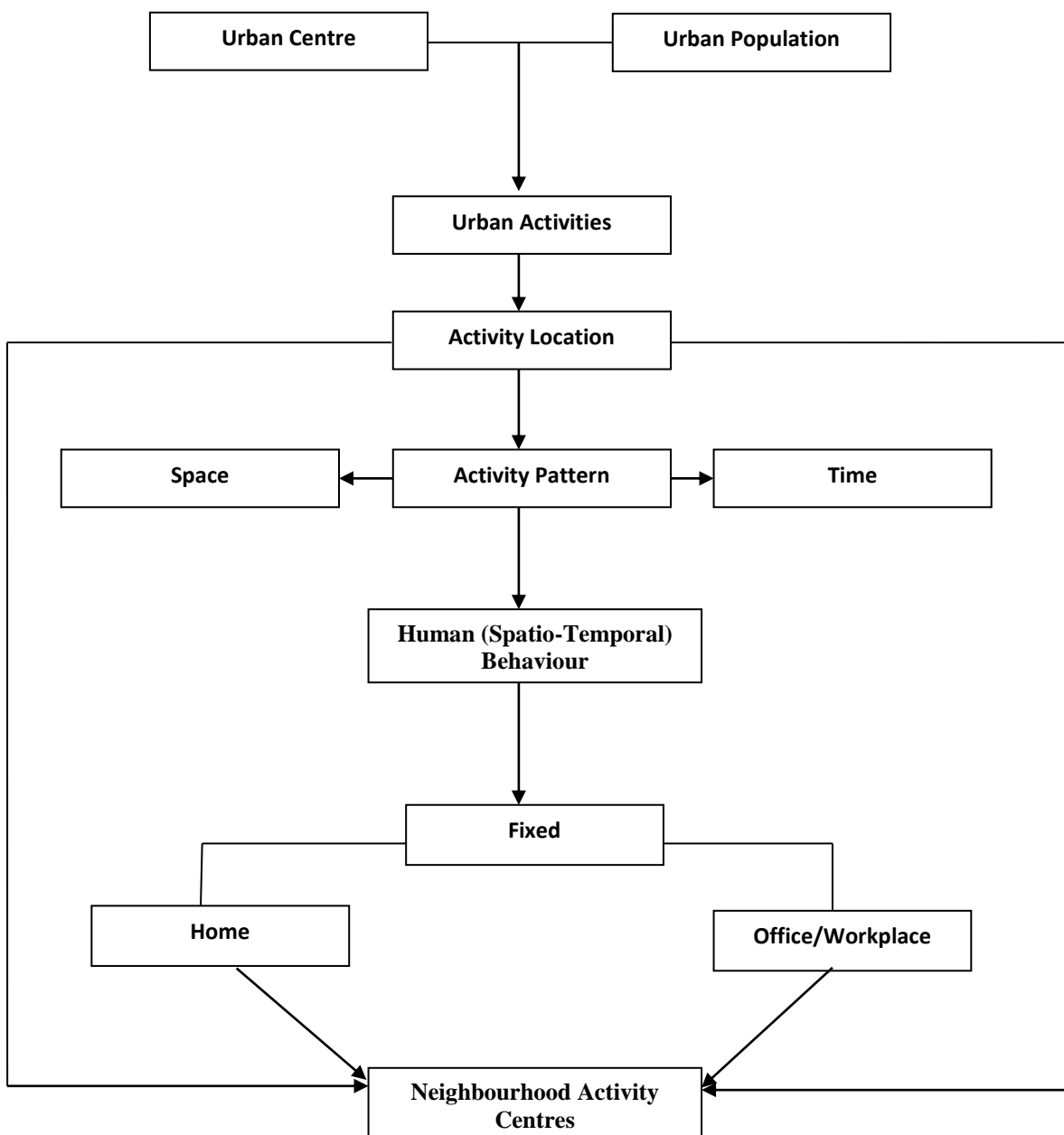


Figure 3: A Model of Urban Neighbourhood Activity Centers

Source: author's analysis

Given a medium size urban centre with its population, there would emerge various types of urban activity located in different parts of the city. The location of these activities would in turn generate activity pattern in space. The activity pattern itself would generate human spatial behavior. In the study area, the human behaviour in space was fixed. The fixity in human spatial behaviour is shared between home and office/work place. The urban neighbourhood activity centre model is of the view, therefore, that in planning for a medium size urban centre in developing world; there may be the need to adopt a strategy that would incorporate the behaviour of the people. Instead of strict land use zonation approach, facilities may be located closely to or around neighborhoods where people are fixed to. In this case and as demonstrated, facilities and infrastructures should be located between homes and work places. Obviously, if there is a demonstrable linkage between two activities in space, it makes sense to locate the facilities housing them in the same space so as to eliminate time and energy consuming travel.(Adedokun, 2009)

DISCUSSION

From the analysis of data in this study, about 90 percent of the respondents had their activities fixed in space. The implication of this is that certain spaces would be in greater (or lesser) demand at a particular time. In Western cities where specialized activities, high income and high automobile and mature transportation development are common, intensive and extensive population movement are a common feature. But Ilorin is a traditional town in a slow transition to a modern industrial – commercial town.

RECOMMENDATIONS

The implications of the findings of this study for urban centers that are at this stage of development are as follows:

- Planning for urban land use and activities should be approached from multidimensional dimension involving the population (people), their activities and locations (of the activities).
- Allocation of land use and public infrastructures should be on the basis of opportunity maximization or constraint minimization to ensure optimality in land use. In other words, instead of strict land use zonation into industrial, residential etc. This should be relaxed to give way to establishment of cottage industries and commercial centers within neighbourhoods.
- In planning for new facility location and to ensure maximum use by the population, it is suggested that activities are located nearer to the people especially between home and work place since the major activity linkages is between home and office/work place. This would eliminate time consuming travels and would encourage people to participate in outdoor activities.
- Also in planning land use and activity/facility location, the issue of accessibility and convenience should be taken into consideration. Since not all activity centers could be equally accessible, a trade off is often necessary. The ideal approach to land use planning and activities/facility location is to locate them at focal points to make them accessible to households. The household or respondent characteristics in this research would appear to favour neighbourhood location of activities, This will ensure optimality in land use and activity location.

CONCLUSION

The conclusion to be drawn is that over the year, studies on urban land use have been dominated by increasing mechanistic (mathematization) approach; better results have not been achieved. There is, therefore, the need for an active involvement of people who are directly concerned in issues relating to land use planning and activity location. Here lies the importance of urban neighbourhood activity centers model proposed in this study (Figure 2) This model if implemented, especially in medium size traditional cities where modern day town planning theory is alien and unenforceable, will help to achieve efficiency and optimality in land use planning and activity location.

REFERENCES

- Abler, R; Adams, J Gould, P.R. (1972) *Spatial Organisation: The Geographers' View of the World*. New York: Prentice Hall.
- Adedokun, O. M. (2008) A Spatio-Temporal Analysis of Activity Linkages in Ilorin, Kwara-State. *Savannah, Volume 21, Number 2*
- Agbola, T. (1986) 'City Profile: Kaduna', *Cities* 3,2, pp 282-289.
- Ajayi, J.O. (1995) 'Landuse competition in the Rural-Urban Fringes of Kano' *Unpublished Ph.D Thesis* Ahmadu Bello University.
- Carter, H. (1975) *The Study of Urban Geography* London, Edward Arnolds
- Chokor, B.A (1986^a) 'Developments in environment-behaviour-design research: a critical assessment in the context of geography and planning' *Environment and Planning A, Vol.18*
- Harris, C. D. and Ullman, E. (1945) The Nature of Cities. *Annals of the American Academy of Political and Social Sciences*. 42, .
- Hoyt, H. (1939) *The Structure and the Growth of Residential Neighbourhood in American Cities* . Chicago, Chicago University Press
- Kwan, Mei – Po (2005) Measuring Activity and Action Space/time in Martins E.H., Lee-Gosselin and T. D. Seen (eds) *Integrated Land-Use and Transportation Models: Behavioural Foundations*. Oxford: Pergamon-Elsevier pp 101-132
- Kwan, Mei-Po (2000^b) Analysis of Human Spatial – Behaviour in a GIS Environment: Recent Developments and Future Prospect. *Journal of Geographical Systems* 2(1) Pp 85 – 90.
- Okpala, E.E. (1994) 'The Geography of Urban Retail and Wholesale Behaviour in Nigeria : An Illustration From Imo-State' *Nigeria Geographical Journal (New Series)* 1, 91-116.
- Olatubara, C.O. (1994) 'Activity Patterns and Urban residential location decisions in Ibadan,' Nigeria. *Unpublished Ph.D. thesis, Obafemi Awolowo University, Ile-Ife, Nigeria*.
- Olatubara, C.O. (1996) 'Urban activity distribution – induced residential satisfaction model' *Ife Psychology* 1^A .
- Onokerhoraye, A.G. (1984) *The study of Urban systems*. Benin city, Ideh Education Publications.
- Onokerhoraye, A.G. (1994) *Urban System and Planning for Africa*. Benin city, Benin Social Sciences Series for Africa.
- Pacione, M. (1982) Space Preference, location decision and dispersal of civil servants from London. *Environment and Planning_A*, 14,3.
- Pred, A. (1967) *Behaviour and Location*. Lund Series in Geography, Part 1, series B, No 27.
- Sada, P.O. (1979) 'Aspects of Spatial Dynamic: The case of Benin' in P.O. Sada and G.E.D. Omota (eds) *Spatial Perspectives in National Development*. Dept. of Geography. University of Benin.