SPATIAL ORGANIZATION AND VARIATIONS IN SOCIO-ECONOMIC CHARACTERISTICS IN DHAKA CITY: AN ECOLOGICAL STUDY (1981)

Ph. D. DISSERTATION

BY

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DEPARTMENT OF GEOGRAPHY

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by

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This is to certify that Magfera Begum completed Ph.D. under my supervision for the degree of Doctor of Philosophy of the University of Dhaka.

This thesis has not been published before and has not been submitted for any degree of any other University or institution.

This is an original research work and has been completed by the researcher herself.

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ABSTRACT

SPATIAL ORGANIZATION AND VARIATION IN SOCIO-ECONOMIC CHARACTERISTICS IN DHAKA CITY: AN ECOLOGICAL STUDY (1981).

The present study is an ecological study and a partial inquiry of social environment of Dhaka city in 1981. The study proposes to identify, analyse and describe the different land use patterns of Dhaka City and investigate how different activities and groups of people are organized or concentrated in different areas of Dhaka city leading to different spatial organizations in the city. The present endeavour inquires into the different socio-economic factors which play vital role in forming different land use patterns of Dhaka city.

Urban ecological technique is useful to understand socio-spatial structure of Dhaka city. As such 'Factorial Ecology' method is used to identify and explain the existing spatial structure of Dhaka city. Different patterns existing in different areas of Dhaka city were sought out by 'Factor Analysis' method with 'Varimax' rotation of 33 socio-economic and demographic variables of 56 wards of Dhaka Municipal Corporation of 1981 census. The spatial distribution of different factors or patterns that resulted from 'Factor analysis' solution were socio-economic status, family life cycle or family status, religious status and other areal differentiating factors which created a complex mosaic of overlapping subareas within the city of Dhaka.

In Dhaka City spatial patterns are mainly differentiated by education level, occupation level number of family members and house type categories.

As a whole, the ecological model of Dhaka city was found to be a mixed land use pattern of Concentric, Sector and Multiple nuclei model of western and non-western cities. This study may be claimed to be exceptional in the sense that very few ecological study has so far been conducted on third world cities.

It is hoped that the present study will help the planners in better understanding the complex nature of the ecology of Dhaka city and aid them in their decision-making process.

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CHAPTER 1

INTRODUCTION

1.1. INTRODUCTION

All human activities, whether interrelated or not, occur in space in certain concentration, which has led to the concept of spatial structure (Garrison and Marble, 1967). 'People generate spatial processes in order to satisfy their needs and desire and these processes create spatial structures which in turn influence and modify spatial processes (Abler *et al.*, 1971, p.13). Spatial structures and processes, in combination with spatial organization, is an increasingly accepted concept (Abler *et al.*, 1971; Labasse, 1966; Soja, 1971, etc.) and it helps to explain past and present spatial structures and processes of different life styles and activities of different social groups of a city.

Different activities do not take full fledged form right at the beginning but originate and evolve in particular places, then spread and change as a result of interaction and it is argued that human interaction in space are formed when physical, socio-cultural and functional needs are intermixed and interrelated.

The underlying set of interrelationships, linkage and flow of various socio-economic factors act to integrate different patterns in different areas of the city. As a result different kinds of social groups are seen in different parts of the urban areas. These

different social groups have different social behaviours and are involved in different economic activities. When a marked or similar socio-economic behaviour is developed by different groups of people in different areas of the city, patterns of different spatial organization are created, for example, high class residential areas, middle class and low class residential areas.

Definite behavioural patterns of individuals and groups are seen in different levels of spatial organization. The style of living, patterns of interaction, attitudes towards life and areas in which families choose to live result from an individual's interaction with his family and friends. Such kinds of differential behaviour is reflected in the areal differences of family size and composition, different socio-economic characteristics and different commercial and social activities that respond to the desire and needs of separate social neighbourhood. These characteristics are thus very closely related in the system of social, economic and spatial organization (Ornati, 1966).

The value of each culture confers prestige on some occupations and style of living, whereas others are regarded as being of low status. Some activities are regarded as important in society in terms of income, power, prestige and honour. Education and professional career are usually required for high status occupation.

Income is also important, sometimes religious affiliation, political power or ancestry are necessary for high social status. So, it is apparent that different socio-economic factor play a vital role in creating inequalities which exist in different social status groups within the city area. Different behavioural consequences of different social status groups create spatial tension in urban areas of a developing city. It is important to remember that social structure is an important concept essential to the understanding of human behaviour in any ecological study.

Urban ecological study is an useful technique which gives us various information about the socio-spatial structure of the city. The concentration, aggregation or segregation of particular type of population or their activities are mainly dependent upon the existing nature of economic condition of the city. Logan (1978; p. 404), saw the ecological theories of spatial differentiation as based on micro-economic competition of individuals, basically complementing the functionalist theory of class stratification[1]. He

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[1] Functionalist theory disagreed with the Marxist theory of social stratification. According to Marx, stratification represented injustice and exploitation, nothing more. On the other hand, prominent functionalist, Kingsley Davis and Wilbert Moor, argue that there are limits to the possibility of creating social equality, the social stratification is not only universal but functionally necessary for any society. By stratification, they particularly refer to the unequal distribution of prestige and material reward.

suggested that spatial differentiation tends to be transformed over time into a rigid stratification of places. He recommended that the political, social and economic inequality among places be understood not only as the result of differentiation but also as a cause of socio-economic system existing in a particular areal unit.

The unique characteristics of a place and its inhabitants are the consequences of its economic and political relations with other places within an urban area, which in turn determine the quality of life of the residents. Place, is therefore, partly an autonomous dimension of stratification in the same sense as the more familiar dimension of class and status (Logan, 1978). Friedman (1978) observed that the city as a form of spatial social organization..... may be regarded as structuring of different access to the bases of social power.

It is essential to know that any social change is occurring within the context of widespread structural change and vice-versa. Timms (1971) described the city as both the 'creator or creature' of urban society and he contends that societal changes produce structural changes in the city. He concludes that with modernization new bases of differentiation are formed with an increasing structural independence among them. The resulting spatial order will vary in complexity as each

differentiating property follows its own distinct pattern. Modernization, industrialization and urbanization have greatly modified the social and spatial structure of the city from the beginning of the 20th century in all developed countries of the world.

This study is the study of areal distribution of socio-economic characteristics of different status groups of the Dhaka city. Dhaka is the capital of Bangladesh, a less developed country where any annual increase in the G.N.P. is practically neutralized by the rapid increase in population. This trend is the result of government policy which accentuated the miseries of vast majority of the people by benefiting a few in the country. The number of landless people increases every year. Income of wage earners in real term is dropping due to inflation. High prices of essential goods including foodstuff have reduced the real income of the majority of people. Due to poverty a vast majority of the people fail to meet their household expenses. As a result most of the people suffer from poor health and they persistently become poorer and poorer. The number of millionaires as well as luxurious residential houses are increasing every year. On the otherhand, a mushroom growth of slums is visible in different parts of the city. The constitutional rights have been violated by different regimes at different times. The arbitary use of power, along with abetting crimes for political gains by the governments in power,

the big gap between promises and performance of political parties and perceptible differences between written law and practices are some of the reasons for causing frustration among the have-nots.

This research work is the ecological study of Dhaka city which enquires into the existing socio-spatial structure of the city and also identifies the different socio-economic characteristics of population grouping in upper and lower strata and how these relationships are manifested in the socio-spatial structure of the city. In other words, the research has inquired as to what extent economic, social and political factors may lead to spatial variation in development of a city. This suggests the need for studying the differences in spatial socio-economic characteristics of Dhaka city within a comprehensive urban ecological framework with the hope that the underlying causes of spatial differences in socio-economic characteristics could be understood based on scientific findings.

1.2. PURPOSE OF THE STUDY

The main purpose of this ecological study is to identify, analyze and describe the different land use pattern of Dhaka city and investigate how different activities and different groups of people are organized or concentrated in different areas of Dhaka city leading to different spatial organizations in the city.

This is the first ecological study of Dhaka city. It is based on census data of municipal wards of 1981. It identifies and explains the spatial functional pattern within the city.

The study may be specified as follows;

(1) Firstly, a set of socio-economic and demographic variables will identify wards by socio-economic and demographic characteristics.

(2) Secondly, the study will investigate the existing pattern of differentiation among the municipal wards which constitute one of the hierarchy of spatial organization of the city. To this end, it is essential to find out whether the municipal wards are meaningfully grouped. Are the patterns of differentiation primarily associated with socio-economic or demographic variables? What other variables contribute significantly to these differentiation.

(3) And lastly, the study will examine the extent of growth and development of various spatial organization of Dhaka city and will test these against the Concentric Zonal, Sector and Multiple nuclei patterns postulated by human ecology and geography. The unequal distribution of goods and services, facilities and infrastructure is clearly reflected in spatial structure of the city. As a result social change leads to spatial changes and spatial changes arise from social change (Milner and Teune: 1978). This research thus used 'Factorial Ecology' method to identify and explain the existing spatial structure of Dhaka city as a case study of a developing city.

The present research is constrained by the limitation of both spatial and non-spatial types of data of 1981 census. The 1981 census data, the author feels, portrays a valuable social, spatial and demographic picture of Dhaka city.

This research would be valuable in the sense that an uptodate picture of Dhaka's ecology would emerge,

based on which physical and social town planners may take steps to rectify the present anomalous situation of Dhaka city. Obviously, this would also contribute to the literature of urban studies in general and urban ecological study in particular.

1.3. THEORIES OF ECOLOGICAL STUDY

The present study is an ecological study of Dhaka city as such it is important to know about some theoretical constructs of ecological study. From the mid-20th century, different social scientists introduced different theories to explain different patterns of land use for ecological study. Senior (1973) suggests, that urban ecological study comprises of three theories. These are as follows;

(a) Urban Ecology Model or Classical Theory,

(b) Social Area Analysis Model,

(c) Factorial Ecology Model of the spatial structure of urban housing and society.

Such a division expresses, chronologically, the lines of development of human ecology.

1.3.1. The 'Urban Ecology Model' or 'Classical Theory' of ecological study was developed by Park, Burgess and Mckenzie (1925). Park in his book 'Human Ecology' explained the interaction and competition that existed in human society. The competition, mainly the economic competition in human society formed different land use

pattern or spatial organization in a city. He recognized different land use pattern created by the processes of dominance and succession and economic competition. As such the Central Business District (CBD) or other highest land value areas dominated over other areas of the city. Succession, indicated orderly sequence of change through which a community passed in the course of time, out of the CBD (dominant land use) into residential areas and take over of a specific neighbourhood by new migrant groups.

Burgess (1927), Hoyt (1939) and Harries and Ullman (1945), developed the Concentric, Sector and Multiple Nuclei model of urban land use patterns of the city (Fig. 1). These theories explained (Concentric zone model, Sector model and Multiple Nuclei model) the ecological pattern of different landuse organization. These models probably generated the most inspired empirical studies. Urban ecologist of this group hypothesized that established land use usually resisted change and a single spatial area typically consisted of predominantly one kind of land use (for example, commercial area or high or low class residential area). This model investigated intergroup and intragroup relationships within urban system.

In human ecology, the spatial component was particularly important in the analysis of spatial stratification (Nizamuddin, 1981). Population succession

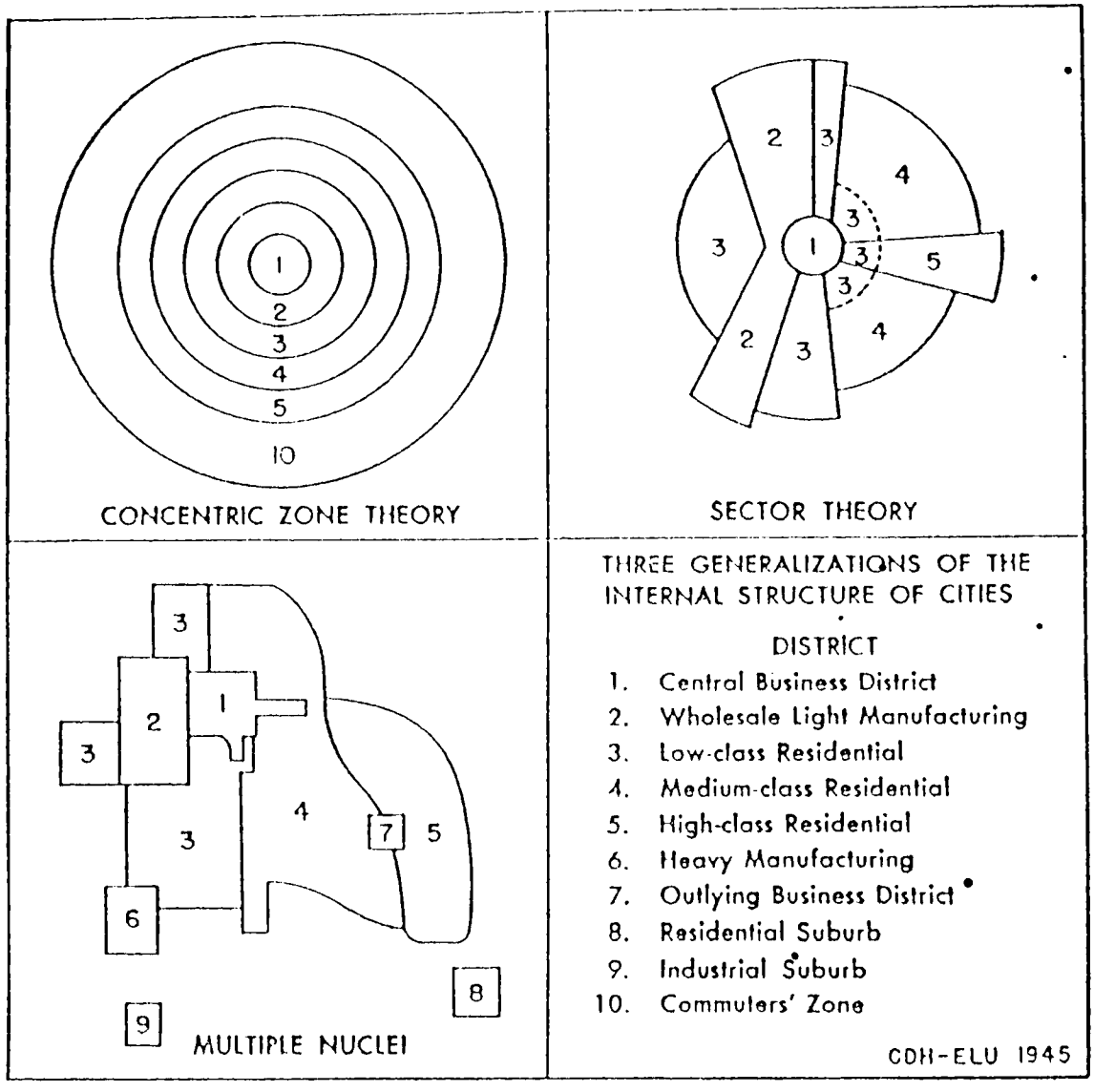

FIG. 1.—Generalizations of internal structure of cities. The concentric-zone theory is a generalization for all cities. The arrangement of the sectors in the sector theory varies from city to city. The diagram for multiple nuclei represents one possible pattern among innumerable variations.

SOURCE: HAGGETT, 1965, P.178

was one of the most important concept of this model. The process of succession began with invasion by new immigrant groups in a given city area. Successful succession occurred if and when new groups gradually came to invade an area occupied by some other older groups. With the passage of time, they improved their socio-economic conditions and were thus able to move from the dismal conditions of the slum areas. Subsequently these slum areas were reoccupied by a new wave of immigrants (Berry and Kasarda, 1977).

1.3.2. **The Social Area Analysis** is another important model of analysing, ecological, socio-economic and spatial characteristics of urban areas. This model was originally outlined by Shevky, William and Bell (1949, 1953, 1955) in their studies of Los Angeles and San Francisco.

Their main aim was to set up categories of variables useful in analysing intra-urban variation and landuse pattern in industrial societies or to describe the ways in which urban population were differentiated in industrial societies.

To understand variations among population groups residing in different census tracts, three dimensions might be needed, according to this school. These were called social rank (Economic status), Urbanization (or Family life cycle indicating family size and age composition) and Segregation (Ethnic status).

Social rank or Economic status measured the position of population of sub-areas or census tracts, combining measures of income, occupation and education. Other measures such as rent, housing quality and density of dwelling units and occupancy also related to this dimension.

The second factor was Family life cycle or Urbanization. Here family life cycle indicating family size and age composition was measured. This could be interpreted as indicating the selective attractiveness of various parts of the urban community as residential environments for different stages of life cycles.

The third dimension was 'Ethnic status' or Segregation or the concentration of particular minority groups in limited neighbourhood of the city or the group phenomenon of isolation. This was also concerned with the degree to which distinctive cultural and racial groups became separated in the city.

This Social area analysis could classify the census tracts into social areas based upon their scores from the above three traditional indices (Shevky and Bell, 1955; Murdie, 1969; Nizamuddin, 1981, etc.). This type of analysis is important for the development of multivariate indices of residential differentiation to classify census tracts. It also attempts to relate these indices to a more general theory of urban development.

Thus Social Area Analysis describes variations in

intra -urban space and provides an important stage in the evolution of residential differentiation studies.

1.3.3. **Factorial Ecology:** The term 'Factorial Ecology' has been used to describe those studies of urban residential areas which employ 'Factor Analysis' as a technique. 'Social Area Analysis' as used originally by Shevky and Bell has now been virtually replaced by this approach which allows more flexibility, without necessary adherence to a preframed theory and potentially at least a high level of objectivity. Factor analysis is not one technique but a collective term which covers a set of alternatives (Herbert and Thomes, 1982, pp. 290-291). Factor analysis is used primarily as an inductive device with which to analyse the relationships between a wide range of social, economic, demographic and housing characteristics (Knox, 1987, p. 126).

The term 'Factorial Ecology' was first coined by Sweetser (1960. pp. 372-386). Rees (1971, p. 20) said that 'Factorial Ecology' sought to explain inter-related characteristics among human populations and their socio-economic environments by first characterising areal differences, then explaining why such differences occurred.

The output of 'Factorial Ecology' had a greater number of dimensions than 'Social Area Analysis' for its vast number of inputs. Within a short time the

techniques were adopted by geographers and planners, helped by an increasing general interest in quantitative techniques. In addition, innovations in computer technology and programming encouraged the use of a large selection of input variables which led to a more explicit inductive approach.

Lastly, the 'Factorial Ecology' was a generally preferred approach for dealing with the complex question of measuring urban socio-spatial differentiation of large number of cities and thus formed the basis for reliable high level generalizations about urban socio-spatial structure (Knox, 1987, p. 126).

All these three models (Urban ecology model or Classical theory, Social area analysis and Factorial ecology) are basically ecological model which among other aspects of urbanization, attempt to depict and analyze the extent to which socio-economic status and inequality are associated with certain characteristics of population grouping in the upper strata and how these relationships are manifested in the socio spatial structure of the city. Most of the empirical findings do not correspond to the theoretical models of urban ecology. Thus distortion is caused by the fast growth of cities and the emergence of satellite towns and big industrial and commercial estates (Nizamuddin, 1981). Most oriental cities are culturally and structurally different. As such, it is expected that the census department in different

countries would lay emphasis on enumerating different socio-economic characteristics. Obviously, the factor analitycal results were also expected to be different.

Factorial ecology is of basic importance having a superior integrating role relative to Classical urban ecology and Social area analysis; this expressed itself in its broader scope for identifying and varifying classical statements and theories by manipulating a large number of variables. This dependence is well illustrated by Senior. The 'Factorial Ecology' approach has been applied internationally to various cities in developed and developing cities and gives some levels of creditability (Herbert and Thomas, 1982, p. 292). Lastly, the author concludes that because of data constraint, that is as census tract data is not available for the ecological study of Dhaka city, the author has been compelled to accept municipal ward data and accept 'Factorial Ecology' model as a research technique for analysing the socio-economic and spatial configuration of Dhaka city.

1.4. METHODOLOGICAL PROBLEMS ASSOCIATED WITH ECOLOGICAL STUDY

The term 'Ecology' was originally developed by zoologist and botanists to describe the relationships between organisms and their environments. Later this concept was applied to the study of the spacing of individuals and their institutions. Dogan and Rokkan

(1969, p.4) contended that

> In a narrower sense ecology has tended to be used in a wide variety of approaches to the study of spatial and territorial environments of human activity; whether defined in smaller surface units such as tracts of agricultural land, villages, neighborhoods, blocks or precincts or in large administrative units, such as communes, counties, constituencies or even entire natural politics.

As a rule, ecological studies concentrate attention on variations among spatial aggregation units at some level above that of the individual. Ecological studies differ in their choice of variables, in the planning of data collection and the mode of data analysis (Nizamuddin: 1981, p. 27).

Volkoner (1969; p.53) argued that the best approach for dealing with methodological problems associated with ecological research is to ask;

> what kind of inferences are permissible when using aggregated data or specifically how can inferences be made on the basis of such data ?

Usually in ecological studies the areal units used for analysis are so large that they contain heterogeneous elements and areal units of small size tend to be more homogeneous.As such there are a number of theoretical and methodological problems associated with the level of analysis in ecology.

Most of the ecological research is often constrained by the lack of data covering a fullrange of socio-economic characteristics because many census

authorities have been unwilling to expand and collect information on complex phenomena such as people's life style and activity patterns.

Urban sub-areas are most commonly examined by census tract data in ecological studies, as census tracts are homogeneous areal units and other data such as municipal ward data are mainly heterogeneous.

Rees (1970) experimented with differing study areas by comparing census tract analysis with community and municipal analysis in a study of "Chicago Standard Metropolitan Statistical Area". He found considerable agreement among the results of the two analysis, although census tracts were more sensitive in distinguishing internal differentiation within suburbs and patterns of racial differentiation within many communities.

Most of the cities in developing countries experience rapid growth in population over time. Thus it is not possible to establish boundaries of city limits of Metropolitan areas in developing countries which often encompass rural population. As such ecological structure of central city and suburban area become more differentiated and they become separate phenomena. Perle (1981) has suggested that suburban area develope a more general ecology that is dominated by status dimension.

Research by Newton and Johnstone (1976) in their analysis of Christ Church, New Zealand, found that areas which ranked highest on the socio-economic status

dimension were also the least homogeneous in their population characteristics, while the suburban areas which ranked highest on a life-style dimension (associated with family status and housing quality variables) exhibited a fairly high level of homogeneity in their population characteristics (Knox, 1987, p. 138).

Another problem arising in the interpretation of the results of Factorial ecologies is 'Ecological Fallacy' which is well known to geographers. For example, if an area is found to be inhabited by both high and low status people where the area occupied by high status people is larger although population wise the number of low status people in the area is found to be more, a spatial aggregate of the area would show it to be a high status area. If this is the case, then such a conclusion would be an ecological fallacy as actually, considering the total economic status of the population of the area, the area should not be classified as high status area. Ecological fallacy mainly occur in analysing aggregate data.

Palm and Caruso (1972) have identified another problem of over interpretation. They suggest that the tendency to interpret factors using only a few major loadings leads to a coarse labelling of factors which obscures important variations in variables with lower loadings.

To side step some of these problems, analysts have

sometimes used grouping procedures such as cluster analysis and multiple discriminant analysis in order to achieve a multivariate classification of census subareas if their main interest were in the overall spatial pattern defined by the input variables rather than in the underlying dimension and their associated spatial expression. These techniques generally group subareas and there is a clear relationship between the number of groups and the sensitivity of the classification .the fewer the groups the greater the loss of detail. In detail, however, the methodology involved is not without pitfalls. Indeed, some cluster analysis procedures are based on an initial factoring of the data; and all multivariate grouping procedures, like factorial ecologies are subject to the constraints imposed by the shortcomings of census data. Moreover, in relation to the search for high level generalizations about urban ecological structure, Factor analysis is likely to remain the preferred technique (Knox, 1987, p. 139).

1.5. LITERATURE REVIEW

Ecological study is very important for analyzing urban social stratification for showing differences in residential segregation and for analyzing the variations of socio-economic condition of different population groups of a city.

Several theoretical and empirical studies have

been conducted using different methods of ecological research. Some ecological analysis are better suited to the method of 'Social Area Analysis' and some by the method of 'Factorial Ecology' model.

1.5.1. Literature Review of Urban Ecology Model.

With the help of 'Urban Ecology Model' or 'Natural Area' concept many sociologist and geographers explain the different nature of landuse pattern of city. The Concentric zone model of Burgess (1927), the Sector model of Hoyt (1939) and the Multiple nuclei model of Harris and Ullman (1949) are important models of this group. This school of model is famous for its empirical studies. 'The Gold Coast and Slum' of Zorbaugh (1929) and 'Ghetto' of Wirth (1928) are two important work of this group of model. Zorbaugh argued that the natural area or geographical unit territorially shifts with the process of invasion and succession. Wirth (1928) in his work of 'The Ghetto' explained the evolution of Jewish ghetto in many European cities and described them as community of interest,motivated by the need to preserve a religion and based upon the inner solidarity of strong family ties.

An explicit reformulation was offered by Hatt (1946) in his study of Seattle. He suggested that natural area concept as developed by ecologists had two interpretations. On the one hand the natural area could be regarded as spatial unit bounded by natural boundaries

with homogeneous population groups. On the other hand, it was regarded as spatially united on the basis of set of relationships analogous to the biological world. He concluded that natural areas could be accepted as logical statistical constructs offering an excellent framework for further analysis. He explicitly used rental values as the delimiting criteria for the first time suggesting that one variable could be used to characterize different part of the city. In a general context there are studies using land values, notably by Hard (1930) and Hoyt (1939) which predict Hatt's study of Seattle. The work by Shaw *et al.*, on Delinquency areas (1929) and Faris and Dunham's work on Mental Disorders in Urban Areas (1939), gave rise to considerable literature dealing with problems of 'ecological correlation'. Much of this work had a clear geographical flavour since it often involved mapping exercises.

Further important contributions to the refinement of the ecological approach were made by Hawley (1950) and Schnore (1965). Hawly presented the ecological approach as the study of the form and development of community structure, emphasizing the functional inter-dependence within communities that results from the collective adoptation competition. Schnore, building on Quinn's work (1939), was able to place human ecology in perspective by elaborating in detail the preconditions and assumptions, implicit in the work of Burgess and others. Schnore's own

preference, like Hawley and Duncan (Duncan and Schnore, 1959) is for an approach in which the notion of ecology is used as a conceptual or statistical framework within which to analyse the internal structure of the city. Theodorson (1961) classified these writers as 'neo-orthodox' ecologist and their work, modified sufficiently to avoid the worst shortcomings of traditional human ecology, has been an important link with much of the more recent work on social patterns in cities.

The re-emergence of ecological approaches during the 1960's is exemplified by Suttles' work (1968) on the Addams area of Chicago. More recently Kearsley (1983) has attempted to modify Burgess's model of urban structure in such a way as to incorporate contemporary aspects of urbanization such as inner city decline, gentrification and decentralization (Knox, 1987, p. 63).

1.5.2. Review of Literature on Social Area Analysis

The methodology of 'Social Area Analysis' was important in its attempt to develop multivariate indices of residential differentiation to classify census tracts and also, in its attempt to relate these indices to a more general theory of urban development.

The first application of 'Social Area Analysis' in Los Angeles and San Francisco by Shevky and William, 1949) provided some confirmation of the utility of the approach. Later, Shevky and Bell in 1955, examined

census tract urbanization and segregation. Six of which confirmed the validity. Other western cities outside the United States which have been studied by this method are New Castle, England (Herbert, 1967); Quebec, Canada (Gagnon, 1960).

Outside North America this methodology have been less successful in establishing the validity of approach either as a theory or as a classificatory procedure. Mc-Elrath's (1962) study of Rome, identified the hypothesized relationships of variables within construct but found that the construct themselves were not independent. He (1968) had also applied this approach to Accra, Ghana and found it necessary to add a forth construct, migration status, a suggestion which has found support elsewhere (Davis, 1978a).

Anderson and Egeland (1961) used analysis of variance techniques to test the existence of zonal patterns of family status scores and of sectors for economic status scores. Their studies in four American cities were able to confirm these spatial models and a similar confirmation was obtained for Winnipeg.

The 'Social Area Analysis' has been questioned on several grounds. In a well known review, Hawley and Duncan (1957) suggested that the theory was a rationalization for the choice of indices. F.L.Jones (1969) saw the use of societal scale as derivative and largely descriptive; Udry (1964) made empirical tests and

found that trends suggested were not consistent over time. Bell (Bell and Moskos, 1964) has suggested that Shevky's original concept of 'Urbanization' was not adequately measured by the ratio's employed. He always preferred family status as description, also accepted the interpretation of Anderson and Bean (1961) that there were two distinct elements known as familism and urbanism.

Basher (1962) admitting no theoretical bases for urbanization, regard social rank and segregation as well established indices of social stratification. This assessment, which finds some support (Morris, 1968; Reissman, 1964), suggests that the constructs are significant as measures of social change though they are not fully adequate in themselves (Herbert and Thomas, 1982).

It should be acknowledged as a classifying procedure with intrinsic empirical value. Furthermore, not withstanding the details of the argument relating to the underlying theory of social change, the conceptual basis of the schema is useful in emphasizing the link between urban structure and the macro processes of social change. This theory has become somewhat obscured by the statistical sophistry associated with studies of 'Factorial Ecology' and it is only recently that urban geographers have redirected their attention towards them (Knox: 1987, p. 126).

1.5.3. Review of Literature on Factorial Ecology

This method is one of the most widely used technique in social research of all kinds. It is now generally the preferred approach for identifying the major dimensions of social differentiation in cities and for portraying their spatial expression. The Factorial ecology method is used in the majority of North American cities, European cities, Australian and other developing cities of the world to analyse the relationships between a wide-range of social, economic, demographic and housing characteristics.

The three leading factors usually bear a close resemblance to the 'Social Area Analysis' constructs of social rank, urbanization and segregation. They also raise the possibility of building a more sensitive model of urban residential differentiation from comparative analysis of 'Factorial Ecologies'. Several attempts have been made to review the relevant literature in search of generalizations about urban structure (Rees: 1971, 1972, 1979; Timms: 1971).

The major finding is that residential differentiation in the great majority of cities is dominated by a socio-economic status dimension with a second dimension characterized by family status/life cycle characteristics and a third dimension relating to segregation along ethnic dimensions. Moreover, these dimensions appear to be consistent even in the face of

variations in input variables and in the statistical solution employed. Evidence from the limited number of studies undertaken of factorial ecology change, show that these major dimensions tend to persist over periods of at least two or three decades (Greer Wootten, 1972; Hunter, 1974; Johnstone, 1973a; Murdie, 1969). There also appears to be a consistent pattern in the spatial expression of these dimensions, both from city to city and from one census year to the next Salin (1971) has shown how the socio-economic status, family status and ethnic status dimension were reflected in sectorial, zonal and clustered patterns from the findings of four U.S. cities Buffalo, Indianapolis, Kansas city and Spokane in the year 1940, 1950 and 1960. Cross reference with other studies and the analysis of variance tests conducted on the relevant sets of factor scores confirm the generality of these findings (Murdie, 1969, 1976; Rees, 1970). According to Murdie, these classical patterns are not simply superimposed on the morphology of the cities. They result from detailed interactions with it and the socio-economic status, family status and ethnic status should be regarded as representing the major dimension of social space which, when superimposed on the physical space of the city, serve to isolate social areas of social homogeneity. In the Chicago study, Berry and Rees (1969) found the major dimensions of residential differentiation were socio-economic status,

family status and ethnicity and these were superimposed on each other to form a series of relatively homogeneous communities. These factors were then integrated with a number of other factors which tend to modify or distort the basic sector and zonal patterns of a city. First, it was suggested that the segregated ethnic areas would contain the entire range of life-cycle characteristics, but in a compressed form, so that zonal variation in family status would differ by direction about the city centre. Another distortion resulted from variations in the growth of the city, the effect of which was to create a star-shaped city with 'tear faults' developing as zones across sectorial boundaries, displacing zones outward in the early growth sectors. Thirdly, the decentralization of industry was introduced, resulting in the formation of areas of relatively low socio-economic status around some of the peripheral industrial centres (Knox: 1987, p.131). It is important to emphasize that these observations represent a high level of generalization and that the results of many studies are ambiguous or even contradictory. In the Montreal study, the socio-economic status dimension is not pure, for it contains some ethnic elements (Foggin and Poles, 1977; Greer Wootten, 1972). Nevertheless many geographers have suggested that the idealized three factor model has substantial generality throughout the Western cultural areas. This is certainly borne out by factorial ecologies

of cities in Canada (Davies and Barrow 1973), Australia (Simpson, 1982) and New Zealand (Johnstone, 1973b, 1973c), but evidence from studies of European cities tends to be less conclusive. Overall, residential differentiation in continental European cities does tend to be dominated by a socio-economic status and the localization of self-employed workers. Continental cities also tend to confirm to the 'Classical ecological model' in the second most important dimension generally relating to family status though often in a complex manner. Ethnicity, however, does not generally occur, as an independent dimension, partly because of the absence of substantial ethnic minorities, and partly because those which do exist appear to be more integrated - at census tract level - with the indigenous population (Burtenshaw, Bateman and Ashworth 1981; White, 1984). British cities, however, do not conform so closely to the general western model. Indeed, it has been suggested (Herbert, 1968; D.Evans, 1973) that British cities exhibit a distinctive ecological structure, with the principal dimensions of the classical model being modified by the construction and letting policies associated with the large public housing sector.

There have been very few factorial ecologies of cities in Socialist societies. Weclawowicz (1979) provides a useful study of Warsaw with 1930 and 1970 data. In 1930, Poland was not a socialist society and the

analysis of that period data identified results closely reminiscent of the Western model. Leading factors were labelled social class by housing quality, ethnicity (Jewish) and demographic or life cycle characteristics. For 1970, a different set of results was obtained. Some residential separation by occupational groups remained and could be identified spatially but this was limited to the specialized artist/intellectual groups provided with special quarters in the central city and a small group of managers who appear to have achieved some privilege in housing. The main feature however, is revealed by the composition of Factor 2(housing) which was the lack of residential segregation amongst main occupational groups resulting from the policy of equalizing housing opportunities. Apart from the central location of artists there were clear difficulties in generalizing upon the spatial form of component scores, and Weclawowicz's phrase 'mosaic spatial structure' reflects these form (Herbert and Thomas, 1982, p. 302).

In non western societies with considerable problems of data bases factorial ecologies have been least developed. Two better known early studies of Cairo and Calcutta (Abu-Lughod, 1969; Berry and Rees, 1969) were affected by these problems revealed in the former by paucity of variables, and in the latter case by the large size of areas. In a study of Cairo, Janet Abu-Lughod found that no factorial separation between indicators of

social rank and the indicators of family cycle stage could be obtained. This contrasts with the normal separation of these two sets of indicators in factor analysis of American city data matrixes. As a result, Abu-Lughod was led to outline in an extremely effective way the conditions that were necessary and sufficient to produce the dimensions of socio-economic status and family status that were not fulfilled in the case of Cairo. She suggested that residential differentiation in terms of socio-economic status would only occur;

(1) where there was an effective ranking system in society as a whole which differentiated population groups according to status or prestige; and

(2) where the ranking system was matched by corresponding subdivisions of the housing market.

Similarly, she suggested that a family status dimension would occur where families at different stages of the family life-cycle exhibited different residential needs and where the nature and spatial arrangement of the housing stock was able to fulfil those needs. Implicit in those conditions was the important assumption that the population was sufficiently mobile to match up social status and life-cycle needs to existing housing opportunities, Abu-Lughod pointed out that those conditions were characteristic of contemporary North American Society, a pre-welfare state in which people were geographically very mobile, and where social status

was ascribed principally by occupation and income. And she also explained that the Cairo study was a characteristics of low scale pre-industrial societies. In such a stage, high correlation among social rank, family status and ethnicity existed and this could lead to the formation of only one unidimensional pattern combining these three indicators. As societies become modernized, they become separated. Berry and Rees (1969) did a factorial ecological analysis of Calcutta, taking the 1961 data for further inquiry into the social profile of Calcutta. They used 'Principal Factor Analysis'of data on 37 variables relating to family structure, literacy, type of employment, housing characteristics and land-use for 80 census wards of the city which was used to operationalise the actual sociogeographic organization of the city. The variables employed were taken from census of India reports on population and from municipal land-use surveys. According to the authors, Calcutta's structure was a mixture of pre-industrial and industrial ecologies, and was characterised by ethnic variability in the form of two zones, a concentric pattern of familism, and an axial pattern of areas according to degree of literacy. They also found both substantial and increasing geographic specialization of areas in business and residential land uses. The first part of the paper contains a good discussion on 'pre-industrial' and 'industrial' city structure, as well as a typology of

'Social Area Analysis'.

Berry and Spodek (1971) in their paper on 'Comparative Ecologies of large Indian Cities' accept the fact that the data taken from the census of India were not very appropriate for the study, and therefore, called their study a preliminary one. In this study, a comparative analysis of the ecologies of a number of large Indian cities - Ahmedabad, Bombay, Kanpur, Madras, Poona (1954) and Sholapur (1965) was presented. While for the first four cities data were taken from 1961 census, for Poona and Sholapur survey data were used. Starting with a discussion of traditional residential patterns in Indian settlements, the authors analysed the principal dimensions in the factor structures of cities for pattern recognition and comparison. They concluded that socio-economic status dimension was the most dominant of those accounting for the residential segregation in the cities, and the prevailing spatial pattern remained that of high status neighbourhoods in the core and low-status neighbourhoods at the periphery substantiating Sjoberg's (1960) generalization about the pre-industrial city. The authors observed that "the increasingly diverse bases of social and economic power, which city life in modern India is generating are transforming the structure". Thus, the structure was in a transitory stage, and generalisation of the model on which the emerging form will converge needed further work.

Brush (1975) in his paper on Bombay and Delhi, had analysed changes in geographical patterns of growth in the two cities, based on factor analysis of 1971 census data of both the cities. He demonstrated that there were inner zones of old upper-class concentration and outer sectors of recent upper-class expansion in both the cities. In addition, he found that the urban cores retained features which reflected traditional preference of the elite for central locations, while recent peripheral growth paralleled the pattern of western cities.

In 'Madras: An Analysis of Urban Ecological Structure in India', Weinstein (1974) used social factor analysis to provide detailed evidence for the case of Madras with 1961 and 1971 census data. He supplemented these with information gathered from a large-scale household survey and from personal observation. With qualifications, he concluded that concentric zone, sectoral and multiple nuclie models described the actual structure of Madras no better than chance alone. At the same time, analysis of survey data provided strong support for earlier contentions that social rank mixed, however, with 'discrepent' characteristics such as presence of houseless persons dominated ecological structure in that city.

Weinstein and Vijayan's (1978) paper on Ahmedabad deals in some details with the mixture of modernity and

tradition in the ecological structure of Ahmedabad. Using historical observations, census and survey data of 1961 and 1971, the authors submit the proposition first put forth by Berry and Spodek - that the ecological structure of Indian cities is 'converging on the model industrial metropolis', to a relatively exact test. They find no such tendency in this 'precolonial' walled city, but rather a complex mixture of trends toward both greater degree of modernity and greater degree of tradition.

Prakasa Rao and Tewari's (1979) study on the ecological structure of Bangalore city presents an analysis designed to examine to what extent the pattern of the ecological structure of the city follows the classical models. The study was based on 1974 household survey and 1971 census data. Twenty variables, representing social, economic, family and migrant status tenure density dimensions were selected to analyse the degree of spatial variations and associated ecological patterning. Banglarore's ecological structure was found to be not simple 'rich centre and poor periphery' of the classical model, but a complex one: middle class city core and both high status and low status periphery. The outward moving periphery left behind older peripheries and constituted a distinct intermediate zone in the ecological scale. The polarised socio-economic groups were multi nuclear in distribution; concentric zonation

was not mappable in simple geometric forms, but the dominance of the city core with its bi-focal structure, and distance from the city core were found to be significant in socio-economic zonal patterns. Sectoral patterns with mixed structure, industries and commercial establishments dominating, emerged along the transport arteries. Thus, the overall city structure was tripartite.[2]

Studies in many parts of the world using the approach of factorial ecology have produced interesting results. Most studies in America and Western Europe usually isolate at least these three dimensions or constructs, while many studies from Eastern Europe have failed to identify the ethnic status dimension. The evidence from studies on cities in developing countries is that family and socio-economic status are not only weakly independent variables but also that the socio-economic status is the more important criterion for segregating households. Additional determinants such as migrant status, ethnic status in areas of powerful poly-ethnics hinterland and caste and religion especially in India, have been suggested (Friedman and Wulff, 1972).

Following Timms (1971), Davies (1984) provides a different framework for explaining variations in urban

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[2] Tewari, V.K.,Weinstein, J.A.; Rao V.P.(ed) Indian cities, Ecological perspective, Concept Publishing Co. New Delhi, India, 1986. pp. 8-12.

structure. He suggests, that historically four major dimensions of social differentiation social rank, family status, ethnicity and migration status have dominated cities every where and that these are combined in different ways in different types of society to produce varying urban structure (Fig. 2).

In traditional or feudal societies, family related considerations dominated the social structure, since prestige and status were based primarily on kinship. In the 'feudal' city, therefore, a single axis of differentiation can be expected, combining social rank, and family status as well as limited amount of ethnic and migrant variation. With economic specialization and the development of external economic linkages division of labour intensifies and a merchant class is added to the political elites and selective migration streams add to the social and ethnic complexity of cities. Davies postulates that these changes led to the creation of three very different types of urban structure, each composed of two dominant axes of differentiation that combined the four basic dimensions in different ways. In 'pre-industrial' cities the perpetuation of family kinship patterns and the continued importance of the established elite combined to produce a single axis of differentiation (social rank/family status), while the arrival of migrant groups of different ethnic origins created a second major axis of differentiation. In

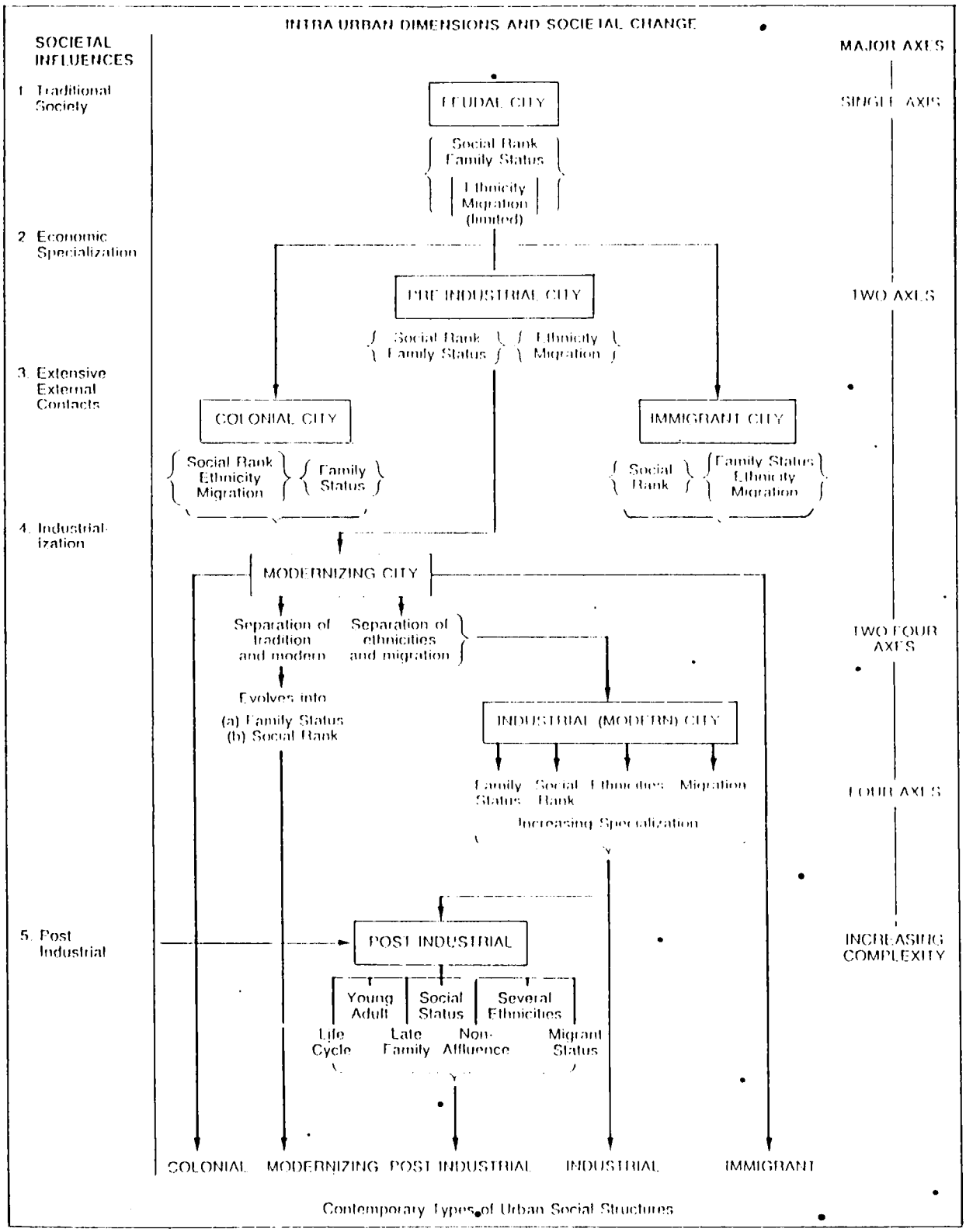


Fig. 2 A developmental sequence of social structures.
Source: Davies (1984) Fig. 9.5, p. 309.

'Colonial' cities that were located in previously settled areas, immigrants would be politically and socially dominant, so that social rank, ethnicity and migration status would be collapsed into a single dimension. Meanwhile family status characteristics would represent an independent dimension of differentiation.

In immigrant cities, the indigeneous political elite remained dominant while the age, ethnic and sex-selective process of immigration tended to overwhelm residential variations in family status. As a result, social rank and migration/ethnicity/family status emerge as the major dimension of residential structure.

The onset of industrialization brought a great increase in specialization, while income and wealth became more important as yardsticks of social prestige. As transport technologies made large scale suburbanization possible, these changes produced a transformation in the characteristics of social prestige and in family organization eventually leading to quite distinct patterns of differentiation in terms of social rank and family status.

Similarly, processes of segregation led to the separation of various ethnic and migrant groups in different parts of cities, thus completing the 'Classic' structure of the modern industrial city (Knox 1984, p. 136).

1.6. RURAL-URBAN AND INTRA-URBAN MOBILITY

Half of the urban population expansion in developing countries is accounted for by migration from rural areas (Santos, 1980; World Bank, 1972).

Generally speaking urbanization in developing societies signifies a rapid transformation of rural labour force to urban areas. Great psychological strain accompany social mobility, though these differ depending on whether mobility is up or down. Most of the migration from rural to urban areas is caused by economic conditions at the place of origin. Other reasons are loss of employment, search for better employment, better housing condition according to their ability to maintain themselves and better social environment.

Most of the migrant groups initially live in low class residential areas. But gradually due to changing level of income, education and occupation, they change their place of residence to better residential areas. Movers select a neighbourhood according to their perception of its characteristics and also their capacity to rent or buy houses in the areas they choose. It seems likely that virtually everyone tries his best to live in a better residential environment. The decision to move depends on economic ability that a family must be able to afford a move. A. Murdie (1975) announced that the nature of intra-urban mobility depend on eligibility, access and competition for better facility. He puts full emphasis

on life cycle on stages of movement in any place and mentions some important reasons of movement. They are (a) change in the family life cycle (b) a change in income (c) a change in employment location, such as the implementation of an improvement scheme on a clearance scheme.

There is a tendency for those who are entirely constrained to find themselves in the inner city, more particularly in the zone of transition whereas the greater amount of movement takes place in the inner and outer suburbs. The final set of factor which induces a change of residence reflects the individual's problems in adjusting to his environment, beyond the effects of physical needs and the constraints of class and culture. People of different areas adjust to local condition of living space through the process of 'Assimilation'.

Joseph Fichter (1957) defines 'Assimilation' as a social process through which two or more persons or groups accept and perform one another's patterns of behaviour. The process of assimilation begins, when the new migrant arrive at a new destination. Many migrants are dissatisfied and return to their original place or move again to a more distant place. The role of friends and relatives is very important in assimilation. If social needs are not fulfilled by mutually rewarding interaction, the immigrants may reject the economic advantages of urban living to return to familiar and

friendly areas (Gordon, 1963, Kantrowitz, 1972, Nizamuddin, 1976, 1981). If assimilation is successful, the migrant begins to assist the relocation of others. Return visit to the old home with economic success often encourage others to join the flow. The mass or population of an area creates opportunities that attract migrants as well as increases the potential number of promoters of virtues of particular areas. Distance will affect the flow of this information. Adjacent areas will be better informed whereas more distant areas will receive competing information from other cities.

1.7. ORGANIZATION OF THE STUDY

The main thrust of this research is to describe, analyze and identify the existing ecological pattern of Dhaka city. This is mainly an ecological study.

This study explores the existing locational pattern of different activities and how different groups of people are organized or concentrated in different areas of Dhaka city. Further this research investigates the variations in land use pattern of the city caused by different socio-economic characteristics.

To accomplice the above objectives the 1981 census data of Dhaka Municipal wards is selected for this research. Municipal wards data is used in this research as basic unit of analysis for undertaking a 'Factorial Ecology' of Dhaka city.

The chapters in this dissertation is organized as follows;

Chapter 1: Discusses the introductory notes and summary of the whole research work. It also points out the methodological problems of ecological study and gives a literature review.

Chapter 2: Briefly discusses old and recent physical, historical and political background of Dhaka city and also analyses the old and new land use zones of Dhaka city.

Chapter 3: Analyses the source of data collection and methodological system of the present research work.

Chapter 4: Discusses elaborately the methodological findings and their results of this study.

Chapter 5: Lastly summarizes and concludes the interpretation of the whole research matter.

CHAPTER 2

GROWTH OF DHAKA CITY

2.1. HISTORICAL BACKGROUND OF DHAKA CITY

Dhaka is an old and historic city which has grown and matured through centuries and has passed through historical phases of intense development and decline. Adoptation of its internal spatial structure formed by long historic evolution to contemporary social and economic conditions especially by development and expansion, has resulted in an increase in their internal differentiation. It is noted that Dhaka has been the capital five times in her recorded history, in 1608, 1660, 1905, 1947 and 1971 respectively for which it has achieved its present form and status.

There are many theories as to the origin of the word 'Dhaka'. According to the most popular version, the name'Dhaka' came from the name of 'Dhaktree'.These trees grew in vast areas of the city. Dr. Tailor suggested that the word 'Dhaka' comes from 'Dhak-Iswari' (the hidden goddess) of Ballal Sen.

Another version is presented by Sayed Aulad Hasan that the word 'Dhaka' was derived from 'Dhak' - a big drum used for amusement. Dr. D.C. Sirkar has declared that the name 'Dhaka' was derived from 'Dhakka'. It was the name of a 'Watch station' which was situated on a

highland from where Vikrampur and Sonargaon could be seen. In this way, the name of Dhaka city was permanently fixed for a long period (Dani, 1956, p. 10).

Atiqullah and Khan (1965) has divided the historic past of Dhaka into five parts; these are -

(1) Dhaka during Pre-Mughal Period (before 1608).
(2) Dhaka under Mughal Period (1608-1764).
(3) Dhaka during East-India Company (1764-1857).
(4) Dhaka under British Rule (1858-1947).
(5) Dhaka during Pakistan Period (1947-1971).

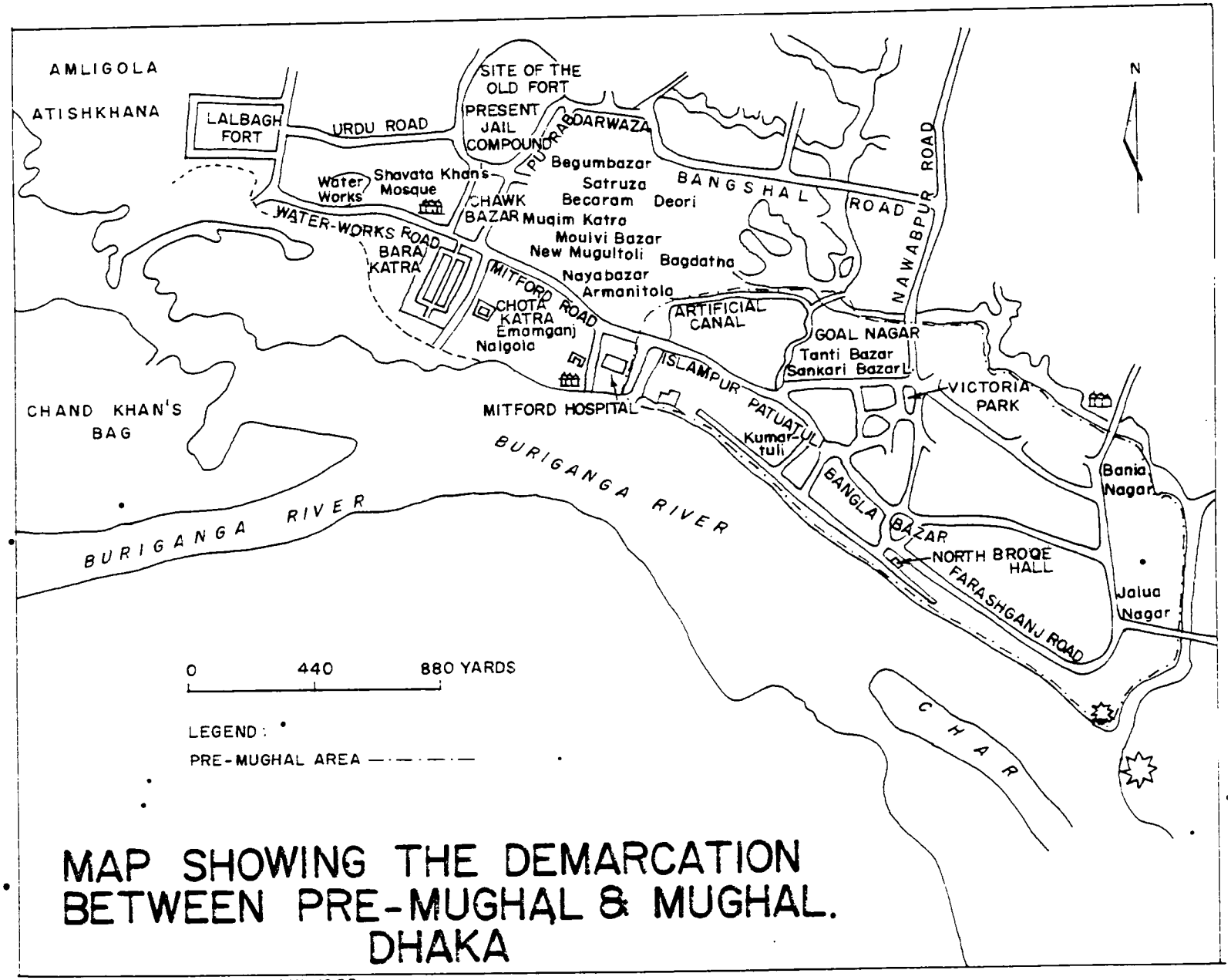
Subsequently, the present author has added the sixth part consisting of post Bangladesh period, that is

(6) Dhaka after Independence of Bangladesh (Since 1971).

A short history of Dhaka under the above guideline is given below:

2.1.1. Dhaka during Pre-Mughal Period (before 1608)

Pre-Mughal Dhaka was under the Buddist Kingdom of Kamrup during the 7th and 8th century. In the 9th century, it was a small market town governed by Sena kings of Vikrampur, situated on the bank of river Buriganga. Some of these markets or bazars are Laxmi bazar, Bangla bazar, Tanti bazar etc. After Hindu rulers, Dhaka was under Muslim rulers from 1299-1608, before the arrival of Mughals. At that time many mosques were constructed all over the city (See Map 1). During the 16th century, Dhaka was ruled by Emperor Sher Shah, the prominent Afgan ruler. The Afgan fort was located at



MAP SHOWING THE DEMARCATION BETWEEN PRE-MUGHAL & MUGHAL. DHAKA

Map-1 , Source: DHAKA , DANI, 1962

the present central Jail. After the Pathans, Dhaka went under the rulers of Sonargaon (Bar Bhuiya) from whom the sovereignty of the area was acquired by the Mughals.

2.1.2 Dhaka under Mughal Period (1608-1764)

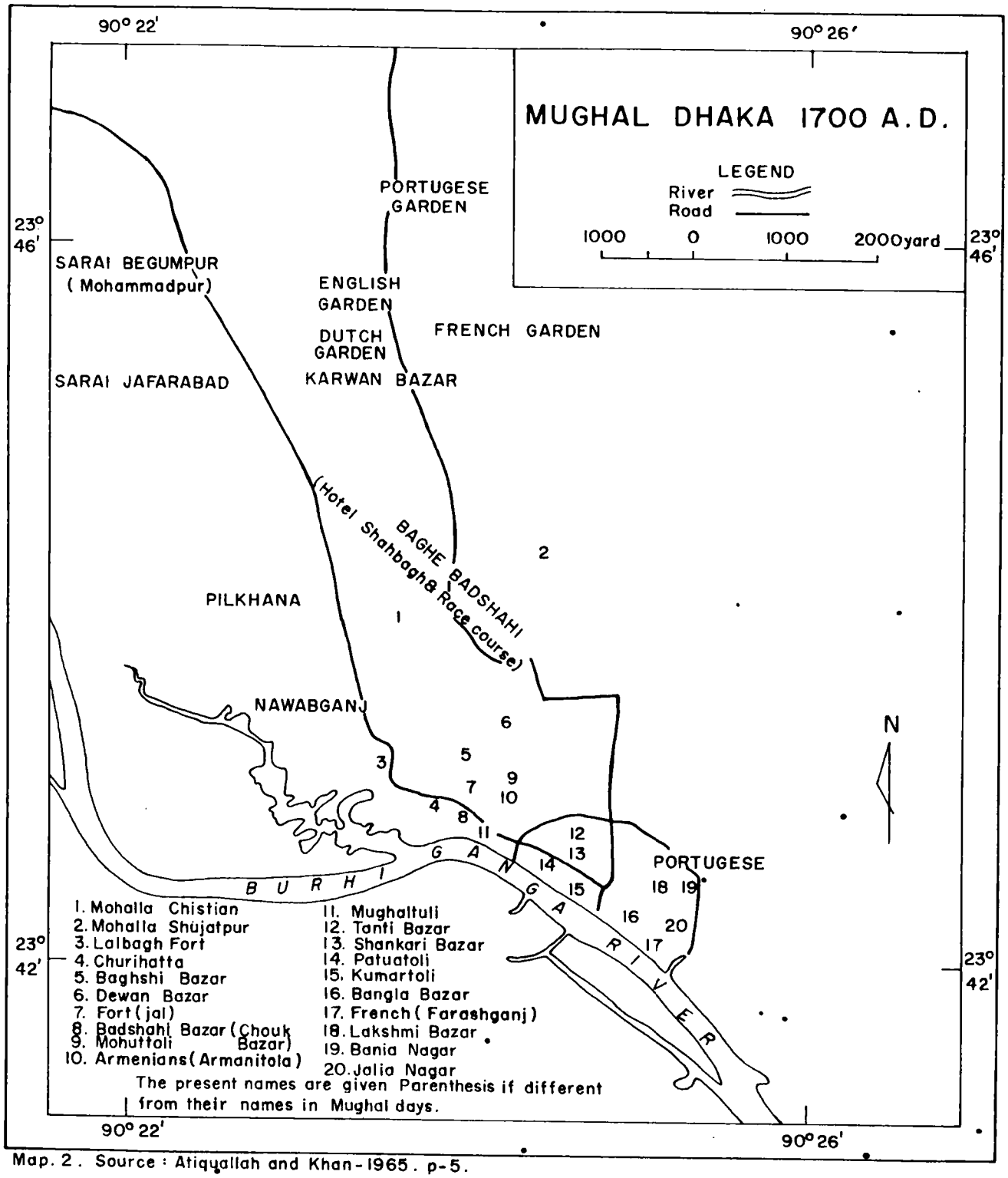
Islam Khan, a renowned Mughal governor of Bengal, made Dhaka the capital of Bengal for the first time in 1608 and renamed the city as Jahangir Nagar after the Mughal Emperor Jahangir. As an administrative headquarter, Dhaka became famous as commercial and trading centre from this period. As a result many European traders came to Dhaka to transact business. They were mostly English, the Portuguese, the French, the Dutch, the Armenians and the Greek traders. At that period, Chawk bazar was the main business centre and Bakshi bazar, Dewan bazar, Urdu bazar were the high class residential areas of the city. In 1640, the capital was shifted to Rajmahal by Shah Shuja and in 1660, the capital was reestablished at Dhaka from Rajmahal by Mirjumla, the then viceroy of Bengal. During the period of Shah Shuja, the extent of Dhaka was about 3 miles in length. Maneshwar was situated on one side of the city and Narinda and Fulbaria situated on the other side respectively. Two types of occupational group of people lived in this areas, one was businessmen and other was service holders. Barakatra, Hosnidalan, Idgah of Rayer bazar were the famous buildings of Shah Shuja's period. In 1650, Churi Hatta mosque was built by Mohammadi Beg.

Shuja's period. In 1650, Churi Hatta mosque was built by Mohammadi Beg. Mirjumla constructed the bridge of Pagla and Tongi and also constructed the Mymensingh road.

During the governorship of Shaista Khan 1662-1677 and 1679-1689, immense development work took place in Dhaka city. At that time, the city stretched 12 miles in length and 8 miles in breadth and the city had a population of over one million. The city developed in all direction around the old fort (the present jail). Shaista Khan built the famous Chotakatra palace, Chawk bazar mosque, Shat Masjid mosque and finished the incomplete portion of Lalbagh fort, which was built by Prince Mohammad Azam in 1678. Many residential cum shopping centres were established in Bakshibazar, Bangla bazar and Dewan bazar. Some specialized area were located between Bangla bazar and Chawk bazar. Shakhari bazar, Kumartali, Patuatali, Sutrapur, Tantibazar, Bania Nagar, Jalua nagar and Churi Hatta (See Map 2, Khan and Islam, 1964, Dani, 1962).

Many fruits and flower garden were seen north of the city. Some of them still retain their names, such as Lalbagh, Hazaribag, Arambag, Rajarbag, Momenbag, Qazirbag, Bag Chandkhan, Bag Hossainuddin, Bag Musa and lastly the big famous bag known as Bag-e-Badshahi or Shahbag (Dani, 1962).

Many foreign traders lived in Dhaka city and had built different factories along the bank of River



Map. 2. Source : Atiquallah and Khan-1965. p-5.

Buriganga. Armenians lived in Armanitola and French and Portuguese lived in Farashganj and Firingi bazar. Their main items of trade were fine costly Muslin cloth, rice, sugar, silk and imported items such as Conch shells, spices and perfumes etc. As a result it was a period of good business and commerce and Dhaka continued to be a peaceful and prosperous city until its sharp decline after the death of Emperor Aurangazeb in 1707 (Atiqullah and Khan, 1965. p. 6).

2.1.3. Dhaka during East India Company (1764-1857)

East India company ruled during the period 1764-1857 and it was a period of unrest, disorder and political instability. The city came into the grips of several major calamities such as famines, floods and fires and suffered heavy casualties of life. In 1800, the population of the Dhaka city was about 200,000 (See Table-1) and it fell to 51636 in 1867 (Khan and Islam. p. 14, 1964). Great famine occurred during 1769 to 1770, in 1784 and in 1787 - 1788 and many people died. Trade of Muslin cloths and other items of export declined sharply. Most areas of Dhaka were covered with bush and jungle during the rule of East India Company.

Although this was a period of miseries, the inception of modern trend in urbanization developed in Dhaka city from this time. In 1820, Mr. Walters, the collector of Dhaka, for the first time established the

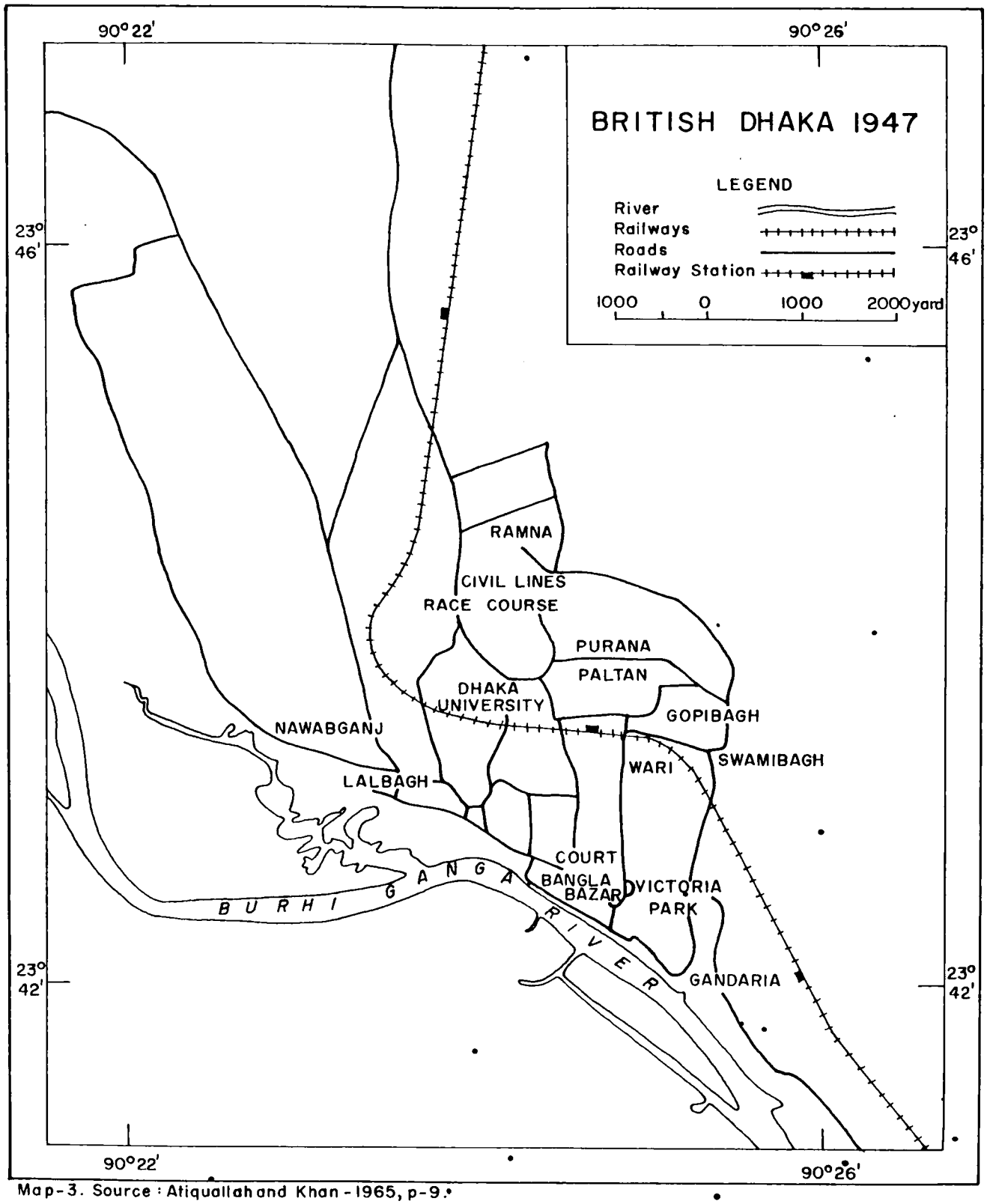
'Dhaka Municipal Committee' for development of Dhaka city. New roads were constructed and the old ones repaired. An English school and a college, later known as Dhaka College was established in 1835 and 1846 near Victoria park. Dhaka District Board was established in 1841. In 1840, Dhaka Cantonment was located at Tejgaon and later shifted to Lalbagh Kella in 1850 (Islam,R. p. 136, 1982).

2.1.4. Dhaka under the British rule (1858-1947)

British crown took over all administrative power of India from East India Company in 1868 after a tremendous revolution against the rule of East India Company in 1857. After this the city started to grow more rapidly.

The city was extended northward by filling up low land and ditches. According to the map of Mr. Rennel, the first Surveyor General of Bengal, Dhaka city extended from Nawabganj to Iron bridge and from the Buriganga river to Nimtali kuthe, the present building of Asiatic Society of Bangladesh (Atiqullah and Khan, 1965. p. 8).

High class residential area were located from North Brook Hall to Ahsan Manzil. Ahsan Manzil was a palace of Dhaka's nawab family and was built by Nawab Sir Abdul Gani in 1872 near the bank of River Buriganga. Mitford Hospital was also established in 1858 near the river bank (See Map 3). The city was, for the first time,



Map-3. Source : Atiquallah and Khan - 1965, p-9.

provided with electricity and water supply after the establishment of the Municipality in 1864.(Dani, 1962. p. 116).

At the time of the partition of Bengal in 1905, Dhaka became the capital of the new province of East Bengal and Assam.But this development was short lived as the partition of Bengal was annulled in 1912. Lord Curzon was then the Governor General of India.

Ramna was the administrative centre of the city, as a result many new modern buildings with avenues were constructed in this area. For the development of Dhaka city, many other important buildings were built. These were Engineering school, Engineering hostel (now Fazlul Haq Hall of Dhaka University), Dhaka Hall, Curzon Hall, Governor house (now Dhaka High Court), Secretariate building (now Dhaka Medical college hospital), Press building (now Engineering University), Bardowan house (now Bangla Academy) etc. Victoria Park was established in the first half of the 19th century.

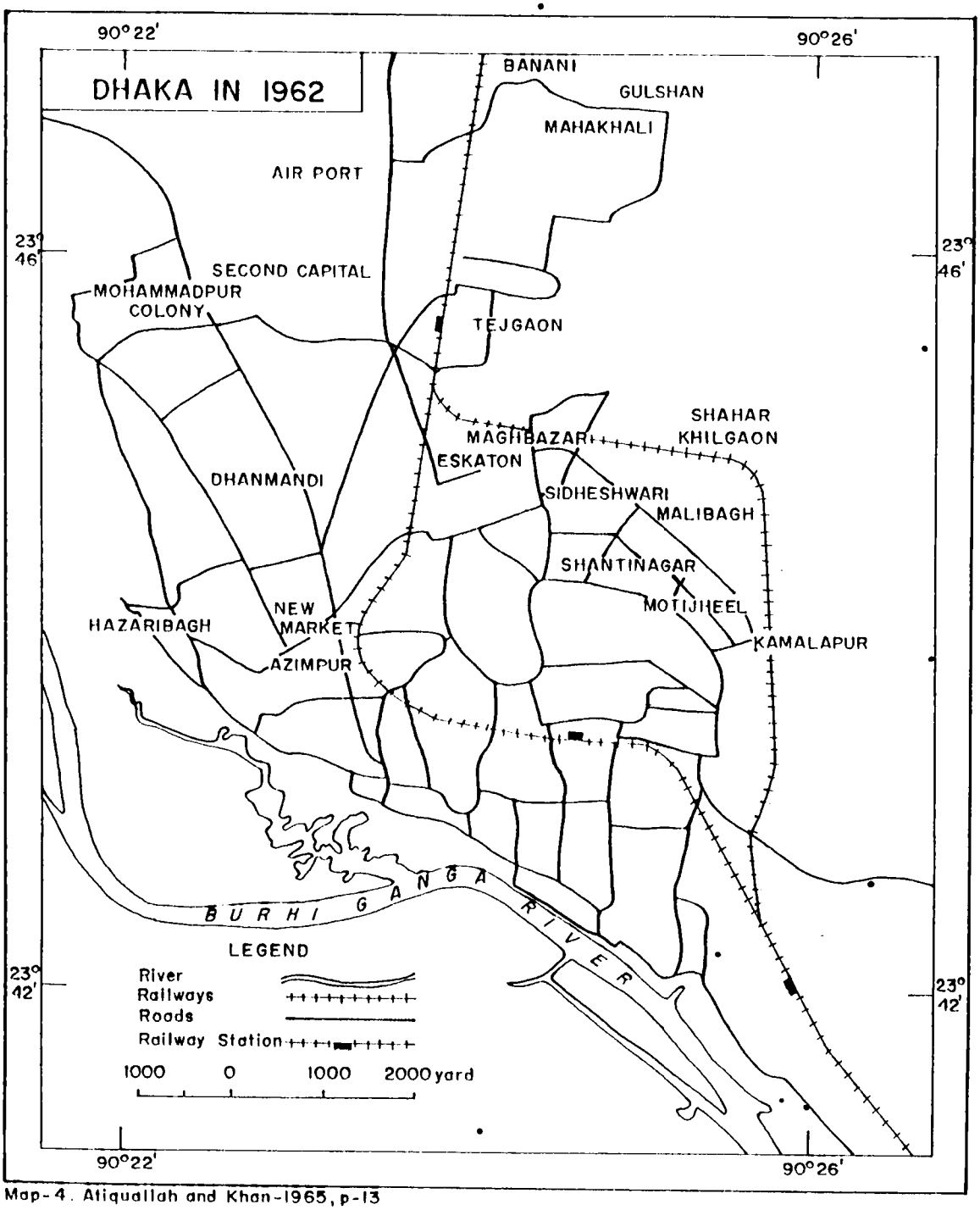
In 1912, due to annulment of partition of Bengal, Dhaka lost its capital status and became a district headquarter till 1947. Dhaka University was established in 1921. Many residential areas were located at Gandaria, Wari, Purana Paltan, Gopibag and Shamibag, Main shopping areas extended from Chawk bazar to Sadarghat and from Buriganga river bank to Nawabpur road. Municipal area extended over an area of 6 sq.miles, though urban

area consisted of about 6.8 sq.miles. Two large scale industries known as Shadhana Aushadhalaya at Gandaria, and Hordeo-glass factory of Hatkhola were established during this period. In 1943 and after the end of the second world war in 1945, severe famines occurred. There were shortages of important goods all over the country and many people died during this period.

2.1.5. Dhaka City during Pakistan Period (1947-1971)

After the partition of India on 14th August, 1947 Dhaka was the provincial capital of East Pakistan, a province of Independent Pakistan (See Map 4). Large number of muslims migrated from India to Dhaka and a large number of Hindus migrated from Dhaka to India. Due to its new status as a provincial capital and to provide accommodation to government staff and refugees, new residential areas were established at Azimpur, Mohammadpur and Motijheel. High class private houses were constructed at Eskaton, Dhanmondi, Moghbazar and Wari. Other residential areas were established at Tejgaon, Mirpur, Mohammadpur, Lalmatia, Rayer bazar, Kamalapur, Khilgaon, Malibag, Shahjahanpur, Arambag, Siddheswari, Gopibag, Shamibag and other areas of the city.

New shopping centre were built at New market, Jinnah Avenue (now Bangabandhu Avenue), Baitul Mokarram , Kawranbazar and Thatari bazar. Later new buildings were constructed for the purpose of administrative and



Map-4. Atiquallah and Khan-1965, p-13

commercial work at Purana Paltan, Shegunbagicha, Motijheel and Dilkusha area. Tejgaon industrial area was established to the west and north of Ramna. The city gradually extended northward and its population increased due to natural increases and migration from rural areas. According to the census of 1961, the population of Dhaka was 556712. New high class residential areas developed at Gulshan and Banani by filling up the low land located in the northern part of the city. As a result, Gandaria, Wari, Purana Paltan, Moghbazar, Shegunbagicha lost their high class status and became the middle class residential areas of the city.

Trend of new urbanization started from this period in Dhaka city. As a result many big buildings and roads were constructed in different parts of Dhaka city. Buildings, such as Dhaka Improvement Trust (now RAJUK), General Post Office(G.P.O.) Secretariate building, Hotel Shahbag (now Post Graduate Hospital) Engineering University, Medical college, Arts faculty of Dhaka University, Science Annex building and other schools, colleges, hospitals, offices, hotels and many buildings for residential purposes were built in different parts of new Dhaka city.

The city can be conveniently divided into two sections by the old railway line. All the areas south of this line are roughly taken as the old Dhaka, which is characterized by narrow roads and is the most densely

populated area of the city. The area lying north of that railway line is called the new Dhaka[3] Roads are wider in new Dhaka than in the old Dhaka area. New railway station was built at Kamalapur and two industrial areas were developed at Hazaribag and Postogola.

Later a new planned area was developed at Shere-e-Bangla Nagar with new architectural design. The construction of present Shangshad Bhaban was started according to a master plan, prepared in 1965 by the famour American architect Louis Kahn.[4]

2.1.6. Dhaka after independence of Bangladesh (since 1971).

Since 16th December 1971, Dhaka became the capital of sovereign Bangladesh. It is the chief administrative, educational, industrial and commercial centre of Bangladesh. According to the census of 1971, total population of Dhaka was about 1679,572. It started to grow and develop rapidly as a metropolitan city (see Map 5 & 6). This rapid expansion of both the urban population and the urban areas generated new social, economic, political, technical and planning problems. The growth of Dhaka city has actually progressed towards north along two highways, one towards Savar and the other

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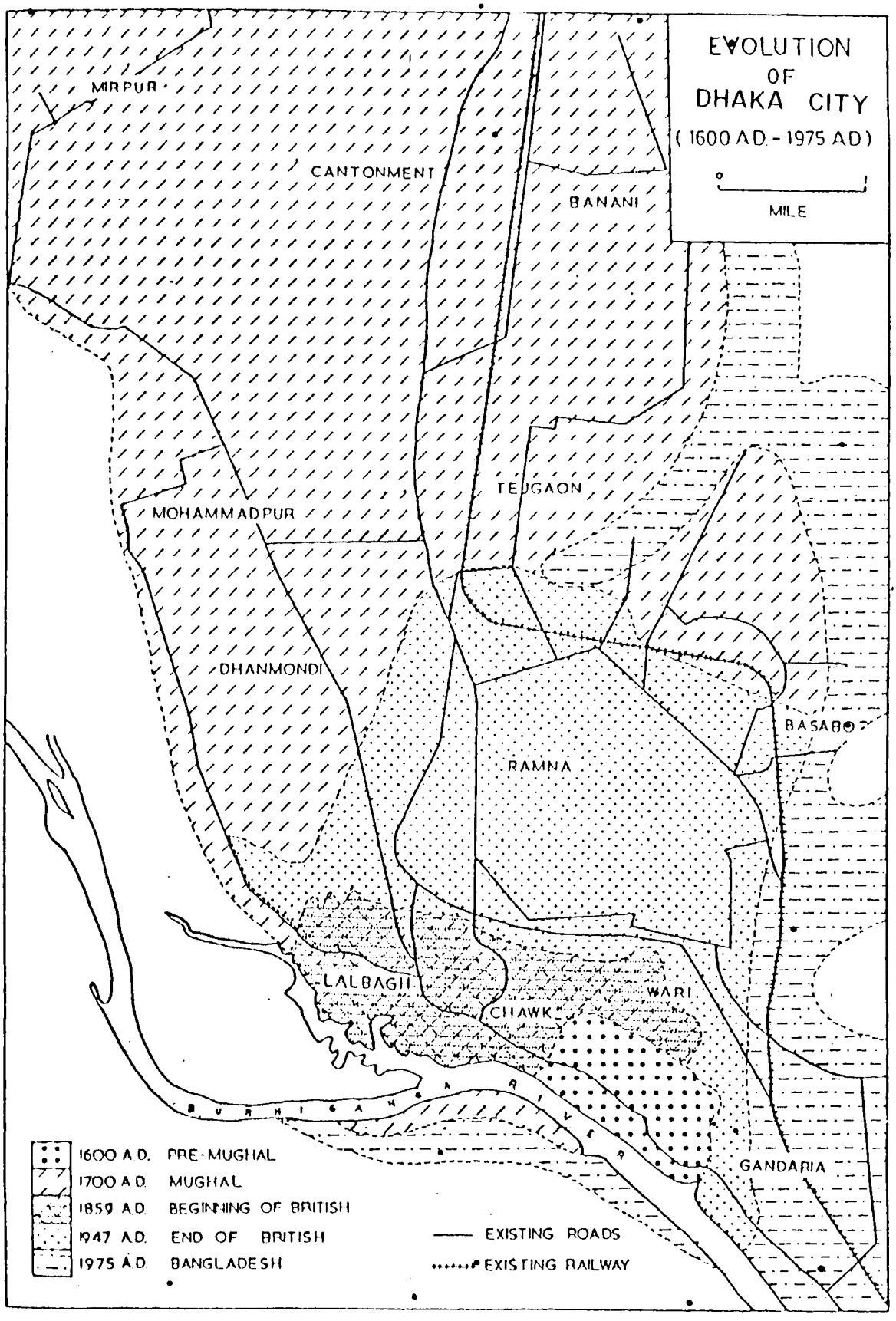
[3]Khan, Amanat Ullah. 'Land Value Pattern in Dhaka City,' Oriental Geographer, Vol. 19 & 20, No. 1 & 2, 1975 & 1976.

[4]Ahmed, Nazimuddin Dr. Architectural Development in Bangladesh: a background, Seminar paper. Dec. 1985, Dhaka. pp. 17-18.



Source: Centre for Urban Studies, Department of Geography, University of Dhaka.

Map-5

Map - 6

Map taken from Shankland Cox, 1980

SOURCES

1600 "DHAKA" BY AHMAD HASAN DANI, 1962
1750 "DHAKA" BY AHMAD HASAN DANI, 1962
1850 BANGLADESH DISTRICT GAZETTERS, DHAKA, GoB.
1950 BANGLADESH DISTRICT GAZETTERS, DHAKA, GoB
1980 STUDY TEAM

THE GROWTH OF DHAKA (1600-1980)

DHAKA METROPOLITAN AREA
INTEGRATED URBAN DEVELOPMENT PROJECT

towards Joydevpur. But this northward expansion of the city is delayed due to stretches of underdeveloped marshy lowlands of the city. The city was then divided into 3 municipals blocks, namely (1) Dhaka Municipality (2) Mirpur Municipality, (3) Gulshan Municipality. Dhaka is now a Metropolitan city and according to the 1981 census, its population is 3.4 million approximately over an area of 160 sq.miles (see Table 1, Fig. 3 and Map 7).

Table 1: Growth of Dhaka City

Year	Area in sq.miles (Approx.)	Total Population
1901	10	104,385
1911	10	125,733
1921	12	137,908
1931	12	161,922
1941	12	239,728
1947	12	250,000
1951	15	335,928
1961	26	550,143
1974	40	1679,572
1981	50	3458,602

Source: (1) CUS, Urban Housing and Shelter process in Bangladesh,Dhaka University, August, 1981, p. 27.
(2) Bangladesh Bureau of Statistics, 1981.

In 1981 Dhaka Municipal Corporation consisted of Dhaka Municipality, Mirpur Municipality and Gulshan Municipality with a total area of 50.5 sq.miles excluding the Cantonment area. According to the census of 1981 Dhaka Municipal Corporation is again divided into 56 wards. Dhaka Municipal corporation and other agencies have done many development work for the progress and

Table - I

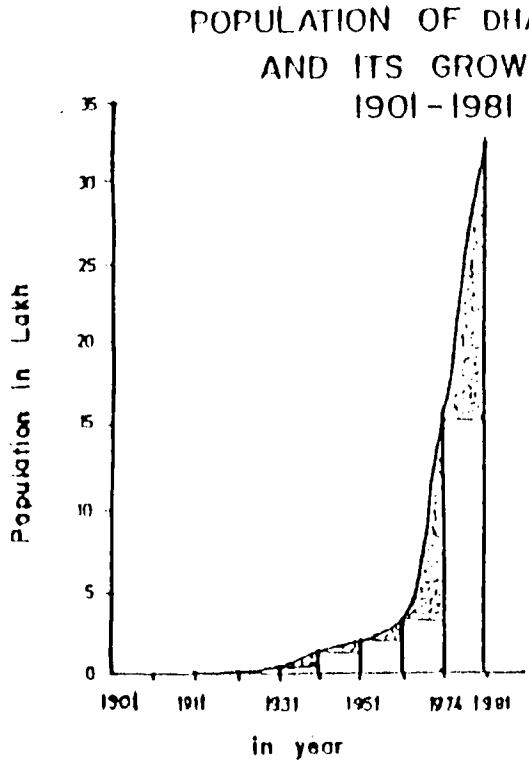
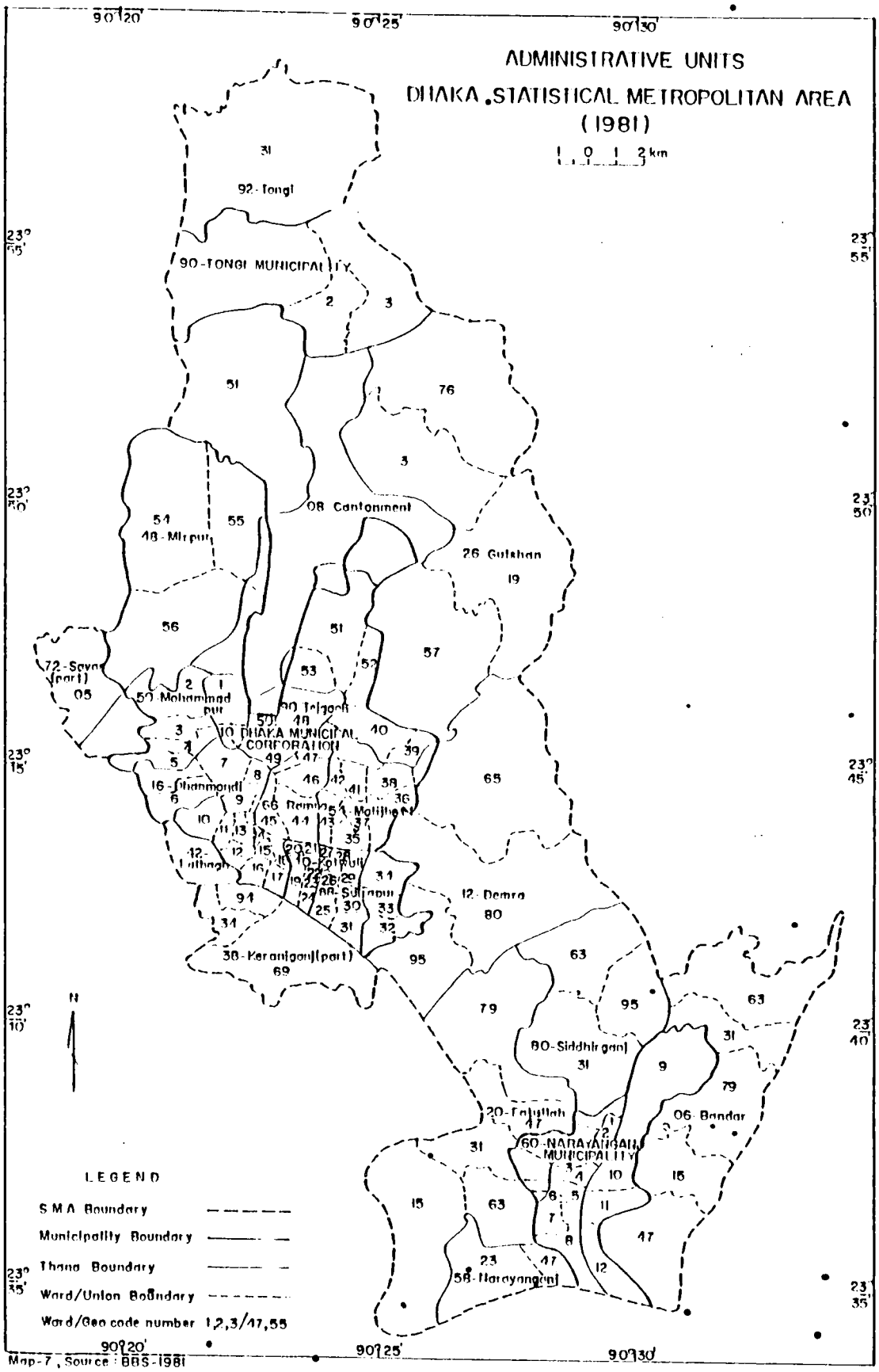


FIGURE . 3 Source Table No.3.3 and Prelimilary Census Report 1981 BANGLADESH



Map-7, Source : BBS-1981

prosperity of Dhaka city. As a result during the last few years Dhaka city flourished as a modern city as compared with other cities of Asia.

The total socio-political environment of the city could not develop as compared with the modern urbanization trend of Dhaka city. This is caused mainly due to the past and present administrative or bureaucratic system which control the administration of the city. Democratic transformation along the capitalist path was likely to generate new inequalities, alienation and exploitation in the socio-political environment of Dhaka city.

Due to the nature of capitalistic productive system of economy of the city, division of labour, wage differences and status differences are common criteria in the city which create different social class in the city. Income of middle and low class people are dropping due to inflation. They are hardy able to maintain their family life.[5]

City populaion has been growing very fast due to rural-urban migration. This inflow was caused by rural poverty and natural disasters and as a result slums are sprouting in different parts of Dhaka city. Most of the immigrants are poor, illiterate and unskilled. As such

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[5]Mohanti, M., "Political Comprehension Of The Post Colonial World" Foreign Affairs, Vol. 36. No. 5, May, 1987.

some of them can only find work as day labourer, rickshaw puller and have to live in squatter and bustee areas of the city.[6]

The slum areas in the city are increasing every year and causing problems for better planning. Such conditions ultimately deteriorate the whole urban environment.[7]

The city experiences heavy rainfall, over 200 inches annually. Almost all of the rainfall is during the Monsoon. The land being flat, it causes extensive water logging in different parts of the city. Planned flood control and drainage system is required for the fast growth of the metropolis.

Dhaka for its size and importance definitely has a very poor transportation system and a very complex one as well. Old Dhaka is very densely populated and experiences very acute traffic problems.

Today's city suffers from wrong locational decisions made in the past and the present planners of Dhaka are faced adversely with the problems of correcting these earlier locational decisions. Different ministries and public utility organizations have control over planning and development of specific services. Often they

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[6]CUS, 1983, Slums in Dhaka city: A socio-economic Survey for Feasibility of slum clearance and Urban Renewal Programme in Dhaka city. Dhaka University.

[7]CUS, 1980. Urban housing and shelter process in Bangladesh, University of Dhaka.

do not coordinate their functions causing inefficient planning of the city as a whole.

Main decisions are taken by the President and his ministers about the shape, the growth, stagnation or alternation of city functions, infrastructure and population dynamics. The development of new areas of the city or redevelopment of old areas require legislative change and executive power that the Municipal Corporation and the Dhaka Improvement Trust or RAJUK do not adequately enjoy. Most of Dhaka's land is in the hand of private ownership and land acquisition is lengthy, cumbersome and expensive process.

Moreover, the city suffers from lack of coordination among the various urban authorities and public utility agencies, such as Dhaka Municipal Corporation, Dhaka Improvement Trust (now RAJUK), U.D.D.(Urban Development Directorate), Power Development, Titas Gas Authority, Flood Control Scheme, Telephone Department etc. Although they undertake development of the above cited public utility services, these organizations are small in comparison to the size of the city. As a result, the city suffers from congestion, unhygeinic condition etc. Private land owners develop their areas for their own purpose and not in the interest of general public of the city.

It should be remembered that man in a capitalist society is considered to be subservient to the power of

money. This society is less motivated by socio-moral standards and hence judges place, space, culture, health, education, sports and shelters by cost or profitability, rather than need or desirability.

All the above conditions (political, economic and administrative) have impact on the social condition, and contribute to the deterioration of the city environment which increase the social stratification of the city itself.

2.2. HISTORICAL PERSPECTIVE OF LAND USE ZONES OF DHAKA CITY

The land use pattern of Dhaka city has changed during the periods of the different rulers due to political, economic and social changes of the city environment. The residential commercial and industrial areas shifted their location over time due to invasion and succession processes of classical theory of ecological study.

The location of these zones on historical perspective are discussed below:

2.2.1. Location of Land use Zones During Pre-Mughal Period

At that time there was mixed land use zones in Dhaka. It was a small market town consisting of fifty two bazars (Dani, 1962). Residential areas were located around the market area.

Main inhabitants of Dhaka were probably the Tantis (weaver) and Shankharis (the conch shell cutter). They

mainly lived in Patuatuli, Kumartali, Bania Nagar, Goal Nagar, Jalua Nagar, Kumar Nagar and Sutar Nagar. These localities were specialized in different items of trade.

2.2.2. Land use Zones of Mughal Period

During this period Dhaka became famous as a commercial and trading centre. Many European traders came to Dhaka to transact business.Chawk bazar was the Central Business District and was called the Badshahi bazar.

During this period separate residential area were developed in Dhaka city. The Princes, Nawabs and Amers of Mughal dynasty built palaces along the two sides of the banks of River Buriganga. The palaces on the southern bank of the river was known as Jinjira palace and those on the northern bank were known as Chotokatra and Barakatra palaces. Around the old fort (the present jail) other high class areas were located at Bakshi bazar, Dewan bazar, Urdu road, Becharam Dewri, Aga Sadeq Dewri, Naqib Dewri and Amanat Khan Dewri. Rich people like ministers, high officials, landlords and wealthy businessmen lived in these areas. Some recreation villas of mughal nobles were also located far from the heavily populatd area of the city. Some of them still retain their names, such as Lalbagh, Hazaribag, Qazirbag, Bag Chand Khan, Bag Hossainuddin, Bag Musa khan, Arambag, Mominbag, Rajarbag, Malibag, and lastly the big famous bagh known as Bag-e-Badshahi or Shahbag (Dani, 1962).

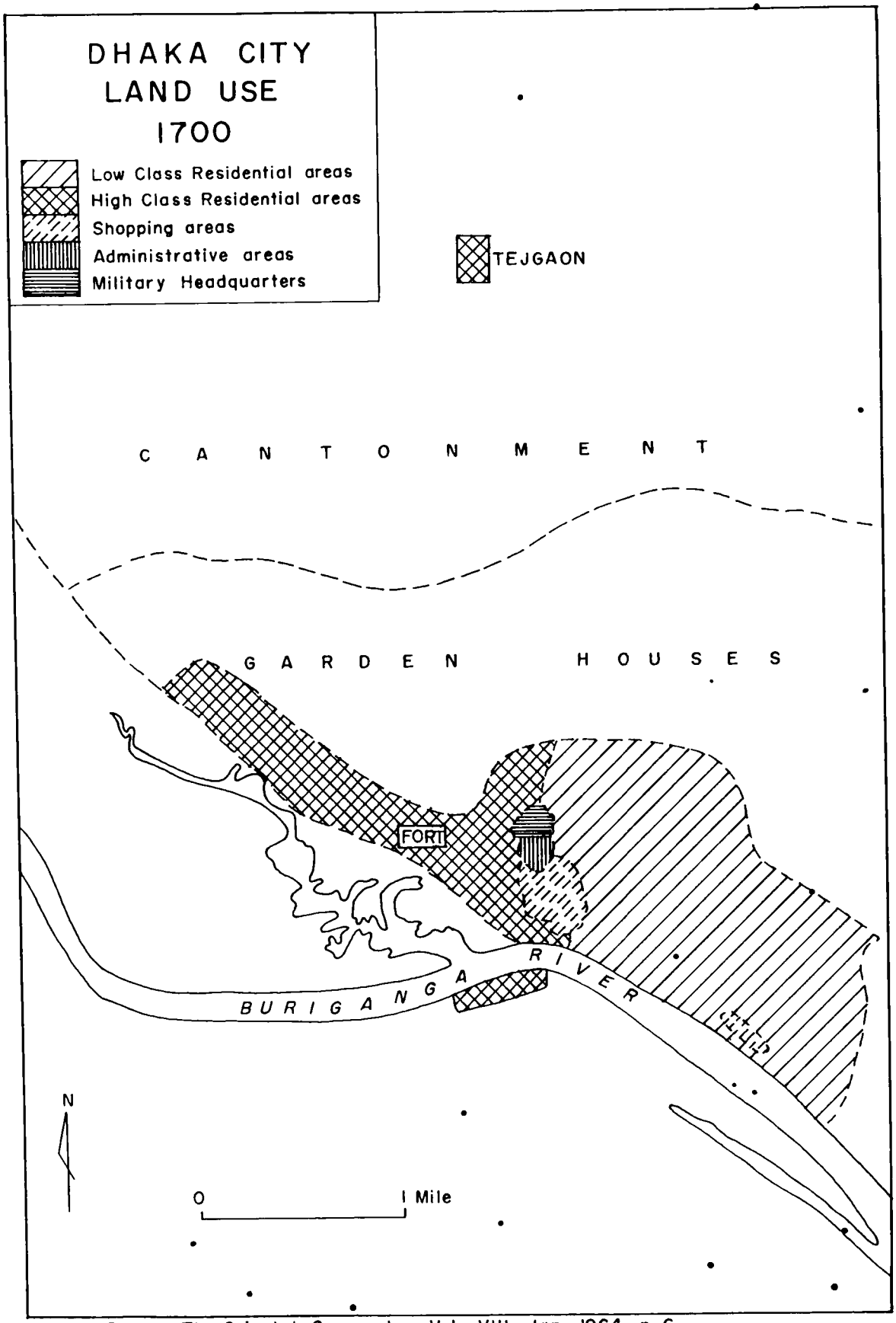
Low class locality mainly surrounded the Dulaikhal and some parts of river bank. Low class people lived in Patuatuli, Kumartuli, Bania Nagar, Goal Nagar, Jalua Nagar, Kamar Nagar and Sutar Nagar (See map 8). These people were petty traders and labourers. Some people mainly engaged in cottage industry. In most cases the same houses were used as the factory and as residence. Other low class area were at Peelkhana and Mahutali.

2.2.3. Land use Zones of British Period

During the early British period, Chawk bazar lost its commercial importance and gradually changed its identity from a retail trade centre to a wholesale one. By 1930, it had completely become a wholesale area and the retail trade area originally developed eastward along the main road of Islampur and then northward along the main road of Nawabpur.

High class residential areas stretched along the bank of the River Buriganga for half a mile from North Brook Hall to the Ahsan Manzil (Nawab palace). British high officials and the Nawab family lived there.

In 1905, when Dhaka became the capital of East Bengal and Assam, the administrative centre shifted from Victoria Park to the Ramna area. Ramna was well planned with many avenues. As a result, high class residential area where European high officials lived, developed at Ramna . Other high class area developed at Wari, Purana



Map-8, Source: The Oriental Geographer, Vol.- VIII, Jan.-1964., p-6.

Paltan and Gandaria where the local Hindu and the Muslim population lived. By 1930, the river front lost its high class residential area character and changed into a low class residential area and main commercial centre of the city. Other low class areas were also found surrounding the areas of Dulai Khal and near the river bank. However, with the gradual expansion of the city towards the north, the existing low class area of Mughal period absorbed more areas.

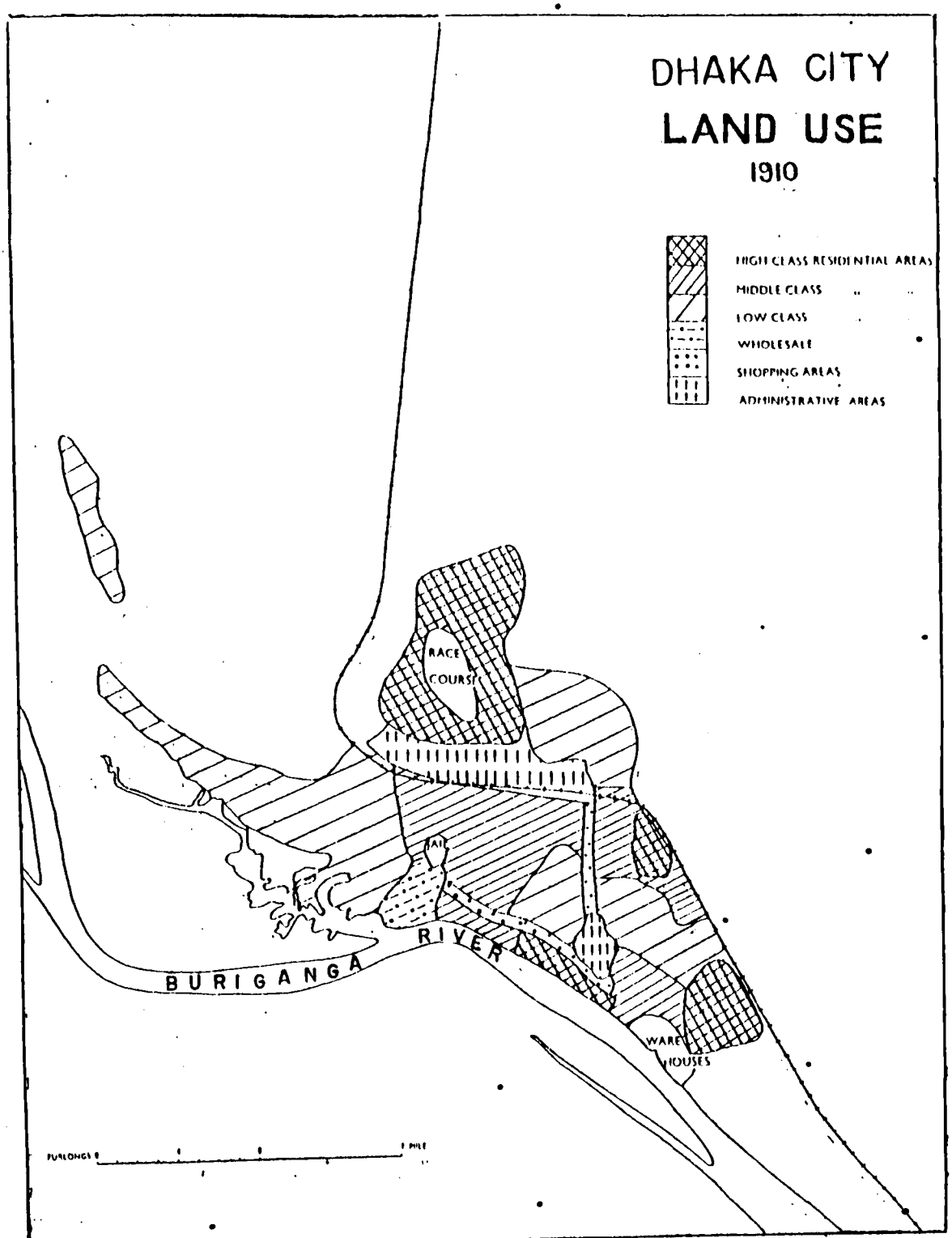
High class areas of Mughal period, such as Bakshi bazar,Dewan bazar, Nawabkatra, Aga Sadeq Road, Begum bazar, Armanitola, Bangla bazar, Laxmi bazar and later Gopibag area changed into middle class areas during this period.

Two large scale industries developed at Hatkhola (glass factory) and at Gandaria (Shadhana Aushadhalaya, a pharmaceutical industry). Other small industrial areas were found at Shakhari bazar (Shell cutting factory), Thatari bazar (Brass metal work factory) and at Tanti bazar (gold and silver and weaving factory).

Many administrative and educational institutions were also established in different parts of British Dhaka (see land-use map 9 and 10).

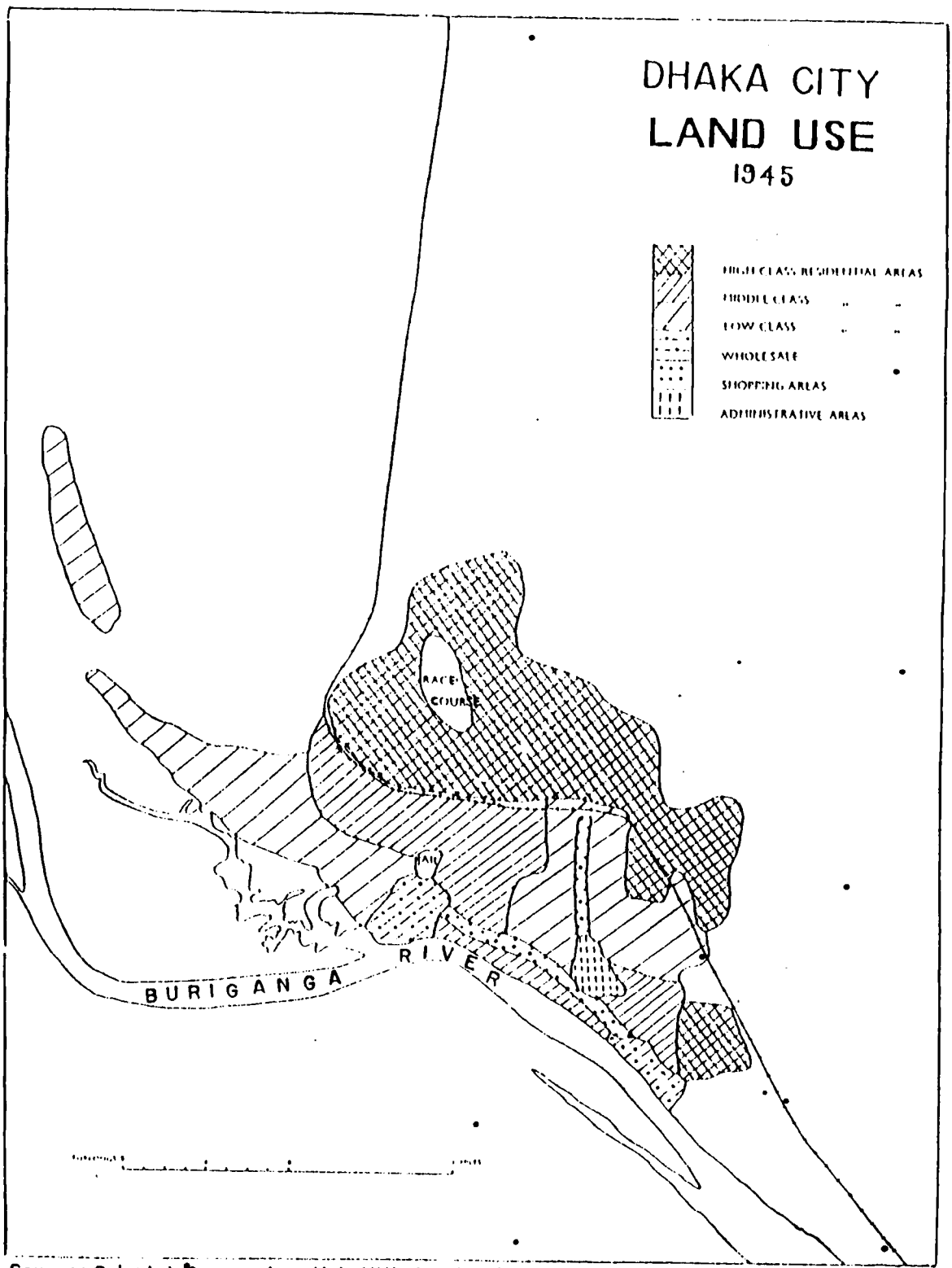
2.2.4. Land use Zones of Pakistan Period

After the creation of Pakistan in 1947, the land use zones of Dhaka city changed rapidly. The city began



Source: Oriental Geographer, Vol.- VIII, Jan. 1964

Map-9



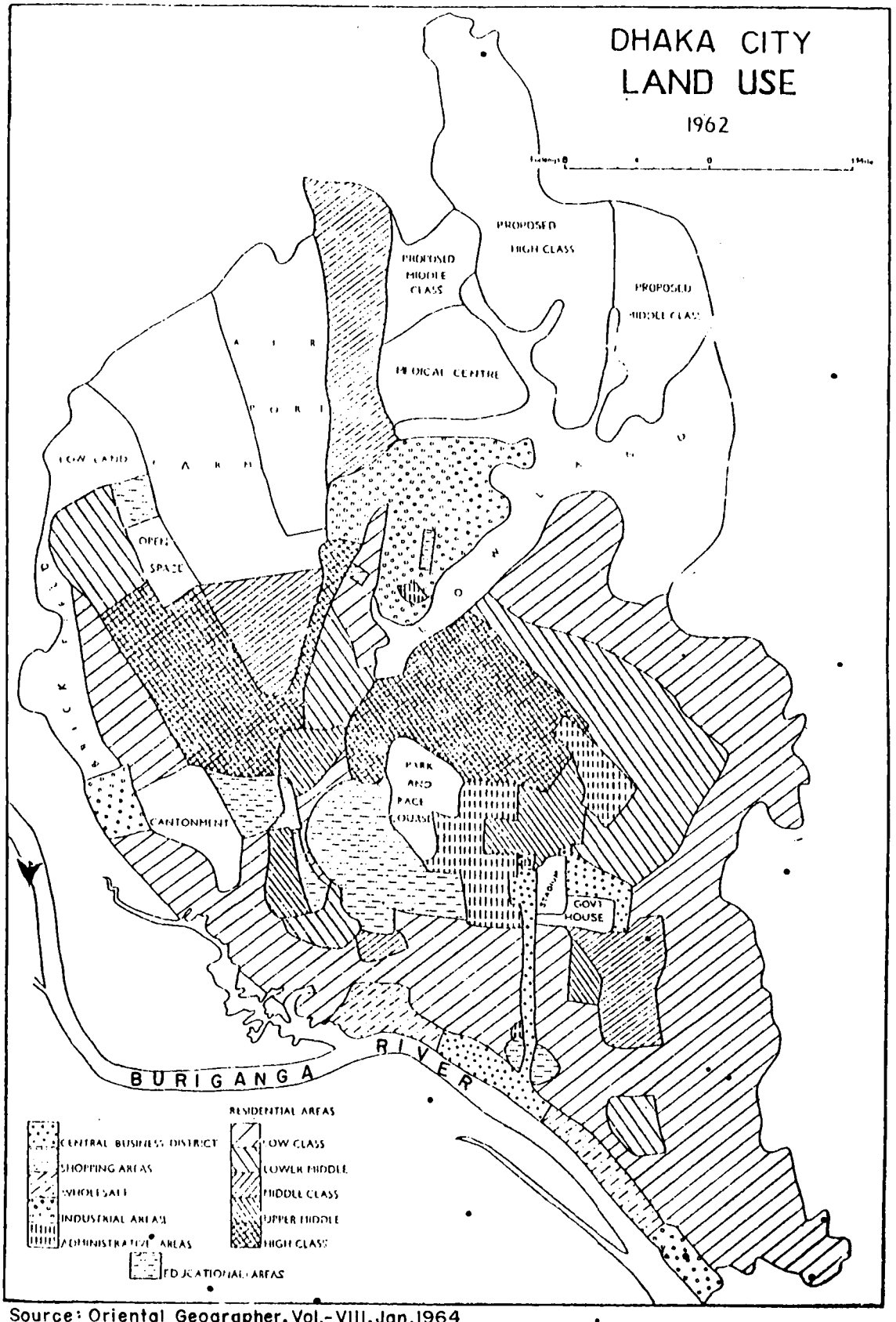
Source: Oriental Geographer, Vol.-VIII, Jan. 1964

Map-10

to expand rapidly towards the north. It became the chief administrative and business centre of East Pakistan. At that time large number of Muslims migrated from India to Dhaka and a large number of residential and commercial areas were established for the accommodation of government staff and refugees in the open space in the northern part of the city. Azimpur, Motijheel and Mohammadpur colony were built for residential purposes. These were middle class areas. Other middle class areas were also located at Rayer bazar, Jigatola, Kamalapur, Lalbagh, Khilgaon, Shahjahanpur, Siddheswari, Arambag, Shamibag and Gopibag.

High class residential areas developed at Dhanmondi and Lalmatia. Dhanmondi and Ramna were two planed high class residential areas of the city at that time. During the later half of Pakistan period Dhaka Improvement Trust (1956) developed two high class areas far from the congested part of the city.These are Gulshan and Banani Model towns, located in the northern part of the Dhaka city.As a result Gandaria,Purana Paltan ,Wari and Shegunbagicha lost their high class status and became middle class areas of the city.Sher-e-Bangla Nagar was developed as residential quarter for staff belonging to the central government of Pakistan (See Map 11).

Areas surrounding the Tejgaon industrial area, Kawran bazar area, Hazaribag tannery area and some parts of old Dhaka, became low class areas of the city. Mirpur



Source: Oriental Geographer, Vol.-VIII, Jan.1964

Map- II

and Mohammadpur refugee quarters also belonged to this group.

Main commercial area or CBD stretched from Chawk bazar to Islampur and from Sadarghat, Patuatuli, Bangla bazar, Nawabpur, Bangabandhu Avenue to Baitul Mukarram and to Motijheel commercial area where large cluster of commercial firm and offices developed with western planning.[8] Purana Paltan, Shegunbagicha, Rajarbag, Tejgaon, Dhaka Improvement Trust (now RAJUK) grew up as administrative centres. Besides Chawk bazar, other commercial area have developed as retail trade centres. Different marketing centre were also established in different parts of Dhaka city. Among them New Market, New Elephant Road market, Airport Road market are important.

Two industrial area were developed during the Pakistan period at Postagola and another at Demra and Narayanganj. Other small scale workshops and factories were intermixed with commercial premises and houses in the old Dhaka city area.

The old Dhaka city could not expand very much in area but it became increasingly congested and the physical growth of the new Dhaka city with unplanned structures grew towards north west, west and towards

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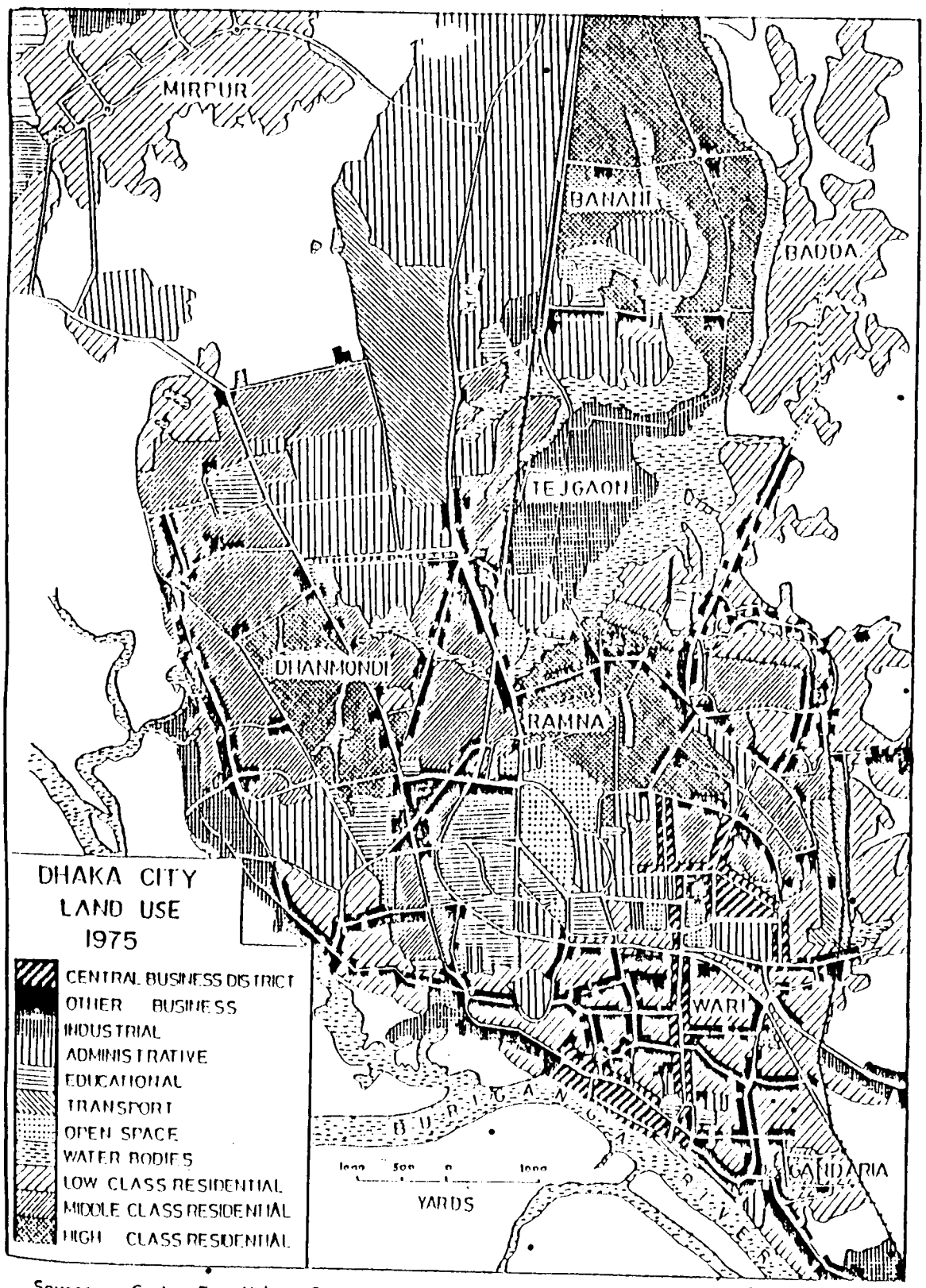
[8]Majid, R., 'The CBD of Dhaka'. The Oriental Geographer, Bangladesh Geographical Society, Vol. XII, No. 1, 1970.

north-east. These characterised the growth pattern as two sectorial patterns with intermixed of high class, low class and middle class areas of the city. One sectorial pattern comprises the areas of Purana Paltan, Shantinagar, Siddheswari, Malibag, Moghbazar, Motijheel, Kamalapur, Arambag, Fakirapul, Shahjahanpur, Khilgaon and Basabo area. Another part of sectorial pattern comprises the areas of Azimpur, Dhanmondi Residential Area, Green Road, Kathalbagan, Kalabagan, Elephant Road Area, Shukrabad, Rayer bazar, Jigatola, Lalmatia, Mohammadpur, Sher-e-Bangla Nagar and lastly Mirpur Area. Cantonment area was located in the northern part of the city.

2.2.5. Land use Zones of Bangladesh Period

During the Bangladesh period the growth of Dhaka city took place in the north and wherever high lands were available. Some earth filling was done for residential purposes, both by the government and by private institutions. Many new residential, commercial and administrative centres were developed in the city by Dhaka Municipal Corporation, the Dhaka Improvement Trust (RAJUK) and other agencies (See Map 12).

Unemployment and housing problem are the main problems in the city life. Due to rapid increase in population, many bustee or squatter shelters developed all over the city creating urban planning problem for the city. Old Dhaka is a densely populated area and has



Source: Centre For Urban Studies, Department Of Geography, Dhaka University

Map - 12

narrow roads and lanes which create acute traffic problem. Though many development work has been undertaken, the remaining unplanned structure of the city still creates a hindrance for its progress and development.

New high class residential area is being developed at Uttara in the north near Zia International Airport. Gulshan, Banani and Baridhara high class residential areas were developed and extended. Dhanmondi Residential Area, Ramna area, one block of Sher-e-Bangla Nagar and Eskaton are other high class areas. In Dhanmondi Residential Area many offices, business centres, clinics and nursing homes are also located. As a result Dhanmondi has became a residential cum business centre of the city.

Within the city, Shamoli, Lalmatia, Kalabagan, Elephant road area and Siddheswari fall under the category of middle class areas. Ramna area, Baily road-quarter, Azimpur, Motijheel, Dhaka University area, Bangladesh University of Engineering and Technology (BUET) campus residential area, Shahjahanpur, Basabo, Khilgaon, Wari, Hatkhola, Gopibag may also be classified as middle class areas of the city.

Low class areas are found mainly along the rail line between Gandaria and Mahakhali, Kamalapur bustee area, University bustee area, Mirpur and Mohammadpur, Basabo resettlement camp of refugees, fringe areas of the city area near the Tejgaon industrial area and also the

inner part of old Dhaka city. Bustees accommodate nearly 40% of the population of Dhaka while covering only about 11% of the city's residential land.[9]

During Bangladesh period Central Business District of Motijheel commercial area became a planned area and developed both vertically and horizontally. Dilkusha was also included as a commercial area. Many offices, firms and banks clustered at these areas.

Besides these retail type of commercial activities are found almost in all the major streets of the city. Most of the shopping centres are well planned. Some of them are New Elephant road market, Airport road market, Mymensingh road market, Mauchak market, Malibag market, Kawran bazar merket, Yusuf market, Naya bazar market, Gulsan D.I.T. market, Green Road market, Mirpur road market and Mirpur market are important.

In Old Dhaka city area, due to non-availability of open space, ground floor and upper floor of many multistoried residential houses are used for business and commercial purposes. Chawk bazar is treated as a wholesale trading centre.

Tejgaon industrial area developed as a planned modern industrial area. Hazaribag and Old Dhaka city area developed as small industrial zones of the city. Many Garment industries were established in different

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[9]Islam, N., "The Poor's Access to Residential Space in unfairly structured city, Dhaka", Oriental Geographer Vol. 29-30, 1985-86.

parts of Dhaka city. Heavy industries are located in Tongi.

Lastly it is important to note that Dhaka city is gradually extending in all directions with the increase in population and in the near future it will be a modern industrially developed city obviously with many unplanned structures in the city.

CHAPTER 3

METHODOLOGY

3.1. METHODOLOGY AND DATA COLLECTION

In this chapter, source of data and the general procedures followed in the selection of variables which are used in this study are discussed. The author here has discussed in detail the source of data, data transformation, and methodology of 'Factorial ecology' procedures for analysing the data of this research work.

In all thirty three socio-economic and demographic variables are selected to analyse the socio-economic and spatial pattern of Dhaka city. The spatial aggregation of data is based on wards and belong to the census of 1981.

The 1981 census is published by the Bangladesh Bureau of Statistics (B.B.S.). This is the second population census of Bangladesh after its liberation. Bureau of Statistics has prepared a separate volume of Dhaka Statistical Metropolitan Area (S.M.A). The bureau collected data of the Dhaka Municipal Corporation on the basis of municipal wards of Dhaka city of 1981. The author has selected this particular year as data belonging to other censuses are not compiled on ward basis for Dhaka city. An inter-temporal comparison showing change in the structural configuration of the city would also have been an interesting extension of the present

study. However, due to non-availability of census data of Dhaka Municipal Corporation on ward basis for 1974, this was not possible and the author had to restrict her study to 1981 census data alone.

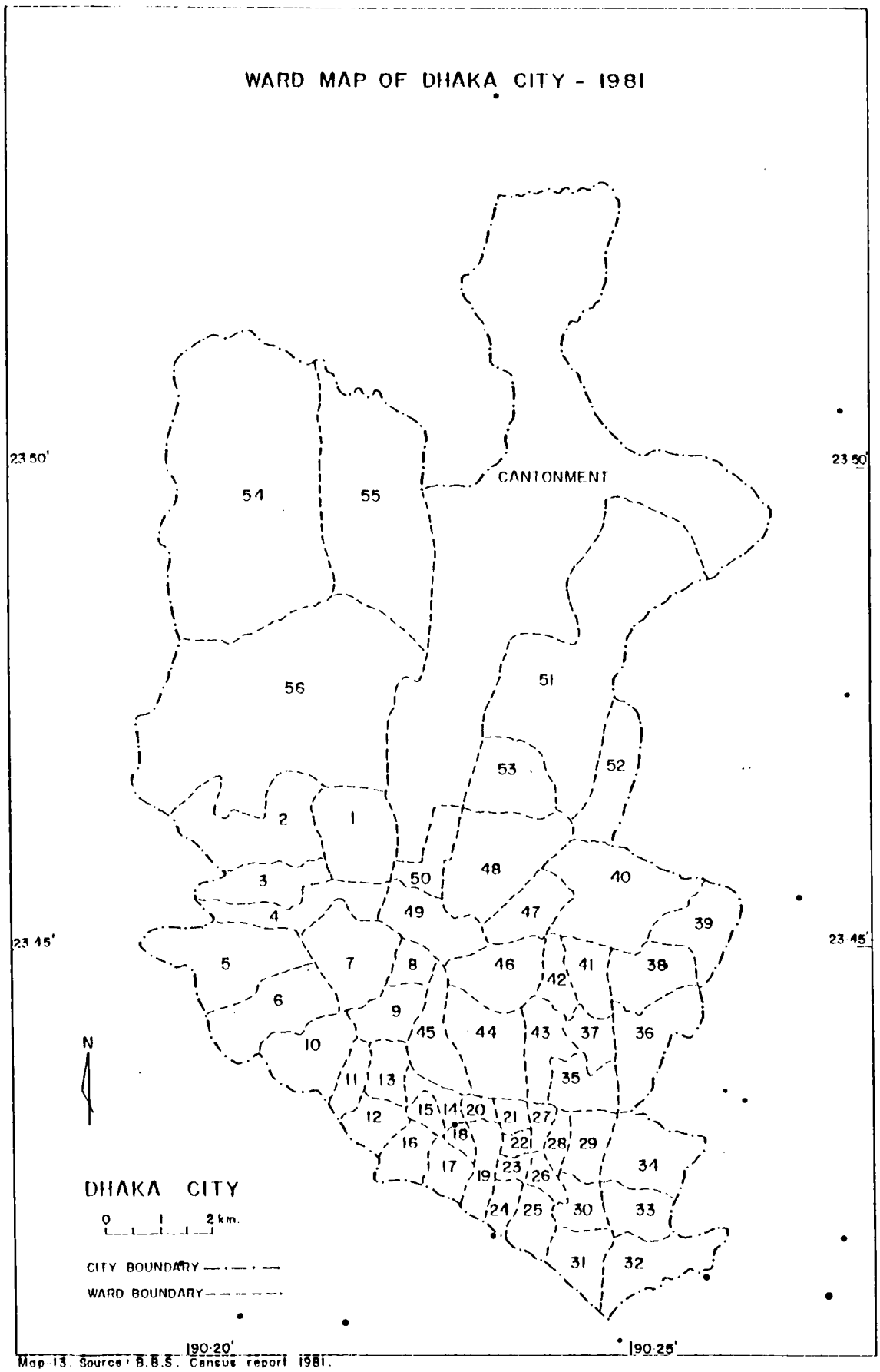
Here it should be mentioned that scholars have investigated ecological patterns based on data for a single year through "Factorial Ecology" method. For example, Doxsey (1982) has analyzed the pattern of residential differentiation and inequality within urban population of Grandi Victoria, Espirito Santo, Brazil, with the data of Brazilian demographics census of 1970. A factor analysis of 40 socio-economic and demographic variables were performed for 232 census selectors selected for that study. Nathan Kantrowitz (1972) in his study of the (using the census tract data of ethnicity of the 1960 only) residential location of racial and ethnic groups in the New York metropolitan area, challenges a number of beliefs that segregation between European ethnicity as a minor and declining phenomenon. On the contrary, the findings of this study lead to the conclusion that ethnic separatism in New York city is still a strong force, that racial segretgation is an extreme extension of the existing ethnic separatism and that all ethnic and racial groups will use the economic leverage of higher income to maintain separatism, these findings imply, pesimistically, that residential desegregation is not readily attainable as a

deliberate public policy. Another important study was done by Berry and Rees (1969). They did a factorial ecological analysis of Calcutta, taking the 1961 census data for further inquiry into the social profile of Calcutta (see literature review of chapter 1).

In this research, the area included in the Dhaka Municipal Corporation is the study area which comprised of 56 wards according to 1981 census. This Municipal Corporation consists of Dhaka Municipality, Mirpur Municipality and Gulshan Municipality; Dhaka Municipality has 50 wards, Mirpur Municipality has 3 wards (ward nos. 54, 55 and 56) and Gulshan Municipality has 3 wards (ward nos. 51, 52 and 53).

The size of the wards varies greatly. Some of them are very small, e.g. wards no. 22 and some other wards are very large, for example, ward nos. 51, 54, 55 and 56. For the purpose of the present research work, the author has used the ward map of Dhaka Municipal Corporation which is published by B.B.S. in 1981, as part of the census report (see Map 13).

The author has collected data on ward basis on the following categories of variables to findout the major patterns of social interaction, such as population, occupation, education, and other households data. For the purpose of analysis, some data are used only after they are converted to percentages. Data concerning slums have been collected from unpublished CUS (Centre for Urban



Map-13. Source: B.B.S. Census report 1981.

Studies) data bank. A few data are also contrived by the author from computer tape of B.B.S. (Bangladesh Bureau of Statistics). Reliable income data on ward basis could not be collected from any source as such this very important variable could not be included in the analysis. In all 33 varaibles are selected for analysing the ecological pattern of Dhaka city.

Most of the ecological studies conducted in western countries are based on census tract data and there is a qualitative difference between census tract data and ward data.

A census tract is a small, socio-economically homogeneous spatial unit. They are exceedingly appropriate for delimiting and analysing intra-urban land-use pattern. Unlike census tracts wards are not homogeneous areas. Areal unit aggregations having similar socio-economic characteristics are not available for Dhaka city.

In Dhaka city, high class residential areas intertwine with residential areas belonging to other categories even with slum areas. This is particularly so because people residing in high class areas need services including domestic help which is rendered by people living in the slum areas. During daytime they work in the surrounding houses and at night reside in dwellings located in the slum areas.

Many rich people also live in the old part of

Dhaka city, this is because of their familiarity with the areas and presence of family relatives. Rich people like to live in their own locality as they often have identity with localities. This creates a major ecological difference from the western cities.

In 1981, slum population and total urban population of Dhaka city were one million,[10] and 3.5 millions[11] respectively. Presence of slums are one common criteria of every ward of Dhaka city. The slum population in the city along with other immigrants increases every year. Different types of natural calamities like flood, cyclone and rural poverty are pushing the landless poor towards Dhaka city for better shelter, better job and other facilities.

In 1974, the population of immigrants among the population of Dhaka was estimated to be 61.26%.[12] Another study published in 1983, reveals that 83% of the migrants to city have come from rural areas, 7.38% from small towns and the rest from other cities and abroad.[13] But by year 2000, the population of Dhaka is expected to be more

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[10] Improvement of slum and squatter settlements, Infrastructure and services, Bangkok, UNESCO, 1984, p. 66, St/ESCAP/302.

[11] Census report of Dhaka S.M.A. 1981.

[12] CUS: 'Squatters in Bangladesh cities', Urban Development Directorate (U.D.D.) Government of Bangladesh, 1976. p. 32.

[13] CUS: 'The people of Dhaka', Urban Development Directorate (U.D.D.) Government of Bangladesh, 1983, p. 51.

than double the figure of 1981, growing to over 7 million.[14] Thus Dhaka has experienced a rapid growth and it will continue to grow more in the future which will create a severe problem for the urban dwellers of Dhaka city.

3.1.1. Factorial Ecology Procedure

Combination of complex statistical methods of analysis and the extension of the 'Social Area Analysis' led to the recent approach in ecological studies known as 'Factorial Ecology' which moves from the treatment of single attributes towards more sophisticated theory and approaches to assess developmental change. 'Factorial Ecology' using the'Factor Analysis' techniques, resolves major patterns of differentiation (interaction pattern, indicator, dimension, factor component etc.) based on the interaction that exist among the urban population.

Herbert (1976a) has conceived of the difference between the 'Factorial Ecology Model' and 'Social Area Analysis' as one of objectivity. He suggests that factor analysis derive constructs by an objective statistical procedure, while Social area analysis through deductive reasoning identifies changes in society, transform them into constructs and select census variables to characterize them.

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[14]Study and Review with Human Settlements situation in Asia and the Pacific, Vol. 2, Country Monograph. Bangkok, UNESCO. p.10. ST/ESCAP/282.

The term 'Factor Analysis' subsumes fairly a large variety of procedures and its most distinctive characteristics is its data reduction capability. Rummel (1970, p. 1) defined factor analysis as a means by which the regularity and order in phenomena co-occur in space or in time, they are patterned; as these co-occurring phenomena are independent of each other, there are a number of distinct patterns. He states ".....thousands and potentially millions of measurements and quantitative observations can be resolved by factor analysis into distinct patterns of occurrence."

According to Williams, F. (1978. p. 151) 'Factor Analysis' procedure takes the variance defined by the intercorrelations among a set of variable measures and attempts to allocate it in terms of fewer underlying hypothetical variables. These hypothetical variables are called factors. Among the large variety of procedures of factor analysis the author here discusses briefly the main steps of factor analysis. They are as follows :-

(1) Selected Data matrix of the research work.

INPUT		OUTPUT		
r-variable	n-variable			
Data Matrix	Correlation Matrix	Initial Factor Matrix or Factor Loading	Rotated Factor Matrix	Factor Score Matrix
1	2	3	4	5

(2) The data matrix are to be transformed to correlation matrix -that is correlation between variables (R-type factor analysis).

(3) Factor matrix are extracted from the matrix of correlation co-efficient by the Principal Component Analysis (PCA) that is a mathematical transformation of original variable to summarize the common patterns of variation among the variables in a table of 'Factor Loading' the correlation between the original variables and the factors.

(4) These factors are then rotated to the normal Varimax position through SPSS programe, in order to 'simple structure' in which variables are allocated mutually exclusively to factors.

(5) Factor score matrix are then computed so as to allocate to each observation, a value that gives it a position on scales defined by the particular factors. As many factors are produced as there are original variables, most of these explain very little of the variance of the original data. Only factors with eigen values of greater than 1.0 are usually regarded as significant.

The factor derived from factor analysis are arranged in order of their importance; the first factor is the most important component, the second factor is the second most important, and so on. The first factor tends to be a general factor, that is, it has significant loading on every variable. Subsequent factors tend to be bipolar, that is some factor loading are positive while others are negative.

The basic tool in the interpretation of the results of the factor analysis is the matrix of factor loadings. Only loadings greater than + 0.4 or less - 0.4 have been included in the table of factors (this interpretation may vary according to choice of researcher).

Then it is task of the researcher to interpret the meaning of the various factors of the factor analysis, both in terms of the variables that 'load' highly (that is correlate highly with) on particular factors, and that are relevant in terms of prior theory and concept.

As a result factor naming is one of the difficult problem in any kind of factor analysis research and it is always considered rough approximation and not a comprehensive description of the characteristics constituting the factors. If some variables are significantly related in a distinctive manner, they form a factor pattern to represent unique interaction. Such a factor thus evolves and identifies the distinct ecological pattern of the city.

Construction of a factor scale (INDEX) is necessary for interpretation of factor score and for making map of different factors.

Thus 'Factor Analysis' determines the inter-relationships among the variables in an effort to find a new set of variables, fewer in number than original set of variables, which express that which is common among the original variables. Factor analysis attempts to simplify complex and diverse relationships that exists among a set of observed variables by uncovering common dimensions or factors that link together the seemingly unrelated variables, and consequently provides insight into the underlying structure of the data.

3.1.2. List of Variables used in the Factor Analysis of Dhaka City

Number of variable	Abbreviation used in Computer Analysis	Variable Name
1	PMUS	% of Muslim
2	PHIN	% of Hindu
3	POCNOTW	% of occupation not working group
4	POCHHD	% of occupation household work
5	POCULT	% of occupation cultivation
6	POACNC	% of occupation agricultural non-crop
7	POMANU	% of occupation manufacturing
8	POBUSI	% of occupation business
9	POOTHW	% of occupation other works
10	PTOINS	% of total institution
11	PTOBIN	% of total business industry
12	PTOKH	% of total kutcha house
13	PTOSPH	% of total semi pucca house
14	PTOPAH	% of total pucca house
15	PHHAL	% of total household having agricultural land

16	PHHCI	% of house hold having cottage industry
17	PTOODU	% of total own dwelling units
18	POTORDU	% of total rented dwelling unit
19	PTORFDU	% of total rentfree dwelling units
20	PDUWIP	% of total dwelling units with one person
21	PT2TO4P	% of total dwelling unit with 2 to 4 persons
22	PT5TOIOP	% of total dwelling units with 5 to 10 persons
23	PDIVML	% of divorced male
24	PDIVFL	% of divorced female
25	PLITML	% of literate male
26	PLITFL	% of literate female
27	PSECML	% of secondary (V toIX) level passed male
28	PSECFL	% of secondary (V toIX) level passed female
29	PDEGML	% of degree passed (Bachelor, Master and Doctorate degree etc) male
30	PDEGFL	% of degree passed (Bachelor, Master and Doctorate degree etc.) female
31	PFLOPOP	% of floating population
32	DNPSK	% of density per sq.acres.
33	SLUM	% of slum population

3.1.3. Explanatory Notes of Different Variables According to Bangladesh Bureau of Statistics (B.B.S.) are as follows;

Institution:
Includes educational and religious institutions, hospital, jails etc.

Business Industry:
Includes those households which carryout business or manufacturing activities in the same premises where they live.

Floating Population:
Persons enumerated in railway stations, launch, steamer ghat,boats, open space, hotels etc. on the census night.

Cottage Industry:
It has been defined as any household industry, mainly accomplished through manual labour the product of which is sold in the market.

Notworking group:
A person who did not work during the last 6th months, proceeding the census data, 6th March 1981. These would include persons looking for work, pensioners, beggars, disabled etc.

Household work:
A person working in his/her own household doing general household work.

Occupation, Cultivation:
A person engaged in agricultural activities, cultivation, for more than 6th months in a year.

Occupation, Agricultural Non-crop:
A person engaged in a non crop agricultural activity such as livestock, poultry, fisheries or forestry.

Occupation, Business:
A person engaged in any business activity such as retail, wholesale or service. However, lawyers and physicians who practise on their own, not employed elsewhere, are also include in this categories.

Occupation Manufacturing:
A person working in any manufacturing industry (private or government).

Occupation Other Works:
(than those mentioned above) means those engaged as service holder, teacher, professor, Manager etc.

Literate Person:
is defined as a person who can write a simple letter in any language.

Rent free Dwelling Units:
means where no rent is paid by dwellers to the owner of the house.

Household having Agricultural Land:
Any member of the household having land within the ward or anywhere of the country.

It may be noted that the above classifications of occupation do not necessarily confirm to standard classifications of industry or occupation. These only give an indication of the main fields of activity of the population of the city.

3.1.4. Name of Mahallas or Areas belonging to individual Wards of Dhaka Municipal Corporation

Mohammadpur Thana:

Ward No. 1 -- Agargaon, Shamoli, Sher-e-Bangla Nagar North and South.

Ward No. 2 - Ataber tek, Mohammadpur blocks B.C.F. Nazrul bagh, Noyer tek, Sheiker tek.

Ward No. 3 - Mohammadpur blocks A, D. E. and Washpur.

Ward No. 4 - Katasur East and West, Lalmatia blocks A.B.C.D.E. and Mohammadpur New colony, Sukrabad, Sobhanbag.

Ward No. 5 - Basila, Jafrabad East and West, Sultanganj.

Ward No. 6 - Afsarbag, Jhigatola.

Dhanmondi Thana:

Ward No. 7 - Dhanmondi R/A, Green Road, Kalabagan.

Ward No. 8 - Cresent road area, kathal bagan.

Ward No. 9 - Central road (North Dhanmondi, Dhanmondi (Vegetable market), Elephant road and Science Laboratory area.

Lalbagh Thana :

Ward No. 10 - Budda Nagar, Bagalpur, Hazaribag, Kazirbagh lane, Kulal Mahal lane, Nabipur, Pilkhana.

Ward No. 11 - Abdul Aziz lane, Hossainuddin 1st and 2nd lane, Naya paltan, Nawabganj Road area and Subal Das Road area.

Ward No. 12 - Jagannath Shaha road, Kazi Riazuddin Road, Lalbagh, Lalbagh fort, Lalbagh road, Shahid Nagar.

Ward No. 13 - Azimpur North and South, Dhakeswari, Sheik Shaheb bazar.

Ward No. 14 - Bakshi bazar, Hosni Dalan, Tatkhan road area.

Ward No. 15 - Chawk bazar adjacent, Khaze dewan and Urdu Road area.

Ward No. 16 - Barakatra road, Islambag East and West, Rahimbox lane and Rahamatganj.

Ward No. 17 - Champatoli Lane, Chotakatra road, Mitford, Kazi Ziauddin Road.

Ward No. 18 - Central jail, Noor box Road.

Kotwali Thana:

Ward No. 19 - Armanitola and Rajani Box lane, Gobinda Das Lane, K.P. Ghosh street and adjacent. Zindabahar.

Ward No. 20 - Abdul Hadi Lane, Abul Hasnat North and South road, Aga Sadek North and South Road, Aga Mashi Lane, Kazi Alauddin Road, Chankhar pool lane, Methor potty, Chikatoly and adjacent and Nawabkatra.

Ward No. 21 - Kazi Abdul Hamid Lane, Lutfur Rahman and Takerhat, Nazira bazar Lane, Siddique bazar.

Ward No. 22 - Golak pal lane, Hazi Abdullah Sarker Lane, Malitola, Mogal Tolly.

Ward No. 23 - Court area and adjacent, Tanti bazar.

Ward No. 24 - Bangla bazar Road, Patuatoli Road, Sadarghat and Noya bazar.

Sutrapur Thana:

Ward No. 25 - Farashganj Road, Hemanta Kumar Das road, Mohon Das Lane, Patla Khan Lane, and Sirish Das Lane, Rupchand lane, Ruplal Das lane.

Ward No. 26 - Kazi Abdur Rouf Road, and D.M.C. office, Bania Nagar, Alamgonj Lane, Goalghat Lane,Bhojoharish, Kather pool and Dholai khal, Nandalal Dutta lane.

Ward No. 27 - B.C.C. road, Captan bazar, Gopi Mohan Basak Lane, Juriatuly lane and adjacent, Jugi Nagar, Bonogram and Nagendra Nath Basak lane, Nawabpur Road and adjacent, Taherbag lane, Thatari bazar, Uttar Mowsaundi.

Ward No. 28 - Bhagban Shah Street and Narinda, Bhajahari Street, Hare Street and its adjacent, Joykali Mondir road and Lalmohan Shaha street, Liakat Avenue and Gurudas lane, National Medical Hospital, Ranking street, C.C.Bose Road, Sutrapur P.S.

Ward No. 29 - Abhoy das Road, Hatkhola Road, Tikatolly, K.M. Das Lane, Shamibag Karatitola, Shah Shaheb Lane, Sutrapur, R.K.Mission Road.

Ward No. 30 - Distelary Road, Gandaria, S.K.Das Road.

Ward No. 31 - D.I.T. Plot and Begum bari, Dhalka Nagar Lane, Faridabad, Hari Chandra Roy Road, Karimullar bag, Mill Barrak, Postagola, including Army camp.

Demra Thana:

Ward No. 32 - Bagicha, Daksin Muradpur, Jurain, Nutan Jurain and Postogola, Pashchim Jurain, Purba Jurain, Rajabazar, Uttar Muradpur.

Ward No. 83 - Dolairper, Mir Hazaribag, Pashchim Jatrabari, South Jatrabari.

Ward No. 34 - Brahmon chiran, Dayaganj, Manik Nagar, Kazirbag, Dhalpur, Jatrabari (North), Saidabad north and south.

Motijheel Thana:

Ward No. 35 - Arambag, Banga Bhaban, Bangladesh Bank area, Dilkusha C/A, Gopibagh 1st to 4th lane, Gopibagh Natun Bastee, Motijheel C/A, R.K. Mission Road, South Kamalapur, T & T Colony.

Ward No. 36 - Ahmed Bag, Mayakanan (Thakurpara),North Mugdhapara, Rajarbag, Sabajbag South, Basabo (Kadamtoli), South Mukdapara.

Ward No. 37 - Motijheel colony, North Kamalapur, Kamalapur Railway station.

Ward No. 38 - Central, West, East, South, North and Madha Basabo, North Madartek, South Madartek.

Ward No. 39 - East Goran, Khilgaon block A. C. Meradia, Middle Goran, Nama Goran, North & South Goran.

Ward No. 40 - Khilgaon Block(B), Khilgaon Chowdhury para, Khilgaon (Hazipara), Khilgaon Taltala, Moulavir tek, Reajbag, Rampura East & West, Bagichar tek, Palash bag.

Ward No. 41 - Dakshin Khilgaon, East Shahjahanpur and Income tax colony, Khilgaon bagicha, Shahidbag, Uttar Shahjahanpur.

Ward No. 42 - Chamelybag, Gulbag, Malibag bazar, Santibag, Rajarbag Police Line, Santinagar.

Ward No. 43 - Fakirapool, Naya Paltan, Purana Paltan, Stadium & adjacent.

Ramna Thana:

Ward No. 44 - Bangabandhu Avenue, Carzon Hall, Dhaka Medical College Hospital, Fazlul Haq Muslim Hall, High court area, Ramna Railway colony, Railway Bustee area, Railway colony, Ramna Park, Segun bagicha and Kakrail, Shahidullah Hall,

Shahjadi wakfa state, T & T and adjacent area, Topkhana road.

Ward No. 45 - Bangla Academy, Engineering University, Peribag, Shohrowardi Uddan, University campus.

Ward No. 46 - Baily Road, Bangla Motor, Eskaton garden, Ispahani colony, Malibag, Mintu Road, New Baily Road & Circuit house, New Eskaton, Siddheswari.

Tejgaon Thana:

Ward No. 47 - Maghbazar, North west, Maghbazar south east, Maghbazar centre, Mirbag, Madhubag, Malibag, Begun Bari, Nayatola, Nayatala wireless colony.

Ward No. 48 - Begun Bari, East Nakhalpara, South west Tejgaon, Tejgaon central, north, north west, North East industrial area, Tejkunipara industrial area, West Nakhalpara.

Ward No. 49 - East Rajabazar, Kawran bazar, West Rajabazar.

Ward No. 50 - Monipuripara, Tejkunipara, Tejturi bazar.

Gulshan Thana:

Ward No. 51 - Banani, Banani Model town Road, Banani all main road, Banani other roads, D.I.T. area, Gulshan Model town, whole Gulshan area, Jagannathpur, Joarshahara Kalachandpur, Kuril, Naval Headquarter, Naya Nagar Bazar.

Ward No. 52 - Budda, Merul, Shadadpur, Ullan.

Ward No. 53 - Abdullapur, Dakhin Mahakhali, Mohakhali, Mohakhali T.B. Gate, Mohakhali wireless area.

Mirpur Thana:

Ward No. 54 - Bamontek, Mirpur Botanical Garden, Box Nagar, Duaripara, Barilganj, Goran Ghat Barj, Kazipuri, Digun, Mirpur section 1,

6, 7, Nalbag, Namarbari, Noabirbag, Pallabi, Puran Kalia, Parbata, Rainkhola, Rana Bhala, Shial Bari.

Ward No. 55 - Alabdirtek, Bigertek, Baishtek, Bonniakali Bari(Bodaldi) Chakulia, Kalshi, Manikdi, Mirpur 12 (A,B.C.D.E.F.) Mirpur 11 A,B.C.D. Mirpur 10, Mirpur Section 13, 14, Palashi Shekertek.

Ward No. 56 - Mirpur 3rd colony, Ahmed nagar, Anandanagar, Bagbari, Bazarpura, Daresssalam, Diabari, Daider tek, Golar tek, Harirampur, Kadertek(west), Kallyanpur, Kazipara, Kotbari, Mirpur 2nd colony, Mirpur cooperative market, Mirpur 1st colony, Mirpur Market, East & West Monipur, North Paikpara, South Paikpara, Pirerbag, Shewrapara South Paikpara, Uttar Bagbari, Zohara bag.

CHAPTER 4

FINDINGS

4.1. FACTOR ANALYSIS RESULTS

In this chapter, an endeavour has been made by the author to analyse the data for this study. The research is based on data collected for 33 socio-economic variables for the year 1981. These data pertain to 56 wards of Dhaka Municipal Corporation.

Factor analysis of a 'Factorial ecology' method is used in this ecological study to analyse the socio-economic and spatial differentiation in characteristics of the wards of Dhaka city in 1981 and to setup categories of variables to analyse intra-urban variations in different land use pattern of the city by which Dhaka's urban populations are differentiated.

According to factor analysis solution using the SPSS programme of computer analysis, six main interaction patterns were yielded through the extraction by 'Principal Component Analysis'(PCA) and the terminal solution were found by 'Varimax' rotation which accounted for 58.1 percent of the variance in the matrix. The matrix of factor loadings is the basic tool in the interpretation of the results of the factor analysis. Only loadings greater than +0.40 or less than -0.40 have been included in this analysis. The selection of these.

number may vary according to the choice of the researchers for better interpretation of different variables to analyse different factors of factor analysis. The rows of factor analysis consists of variables, the columns of factors are arranged in order of size of their eigen values; and the cell entries and the factor loadings, are the correlations of the variables with the factors. These interaction patterns or factors are discussed under the following headings.

Factor or pattern I - Socio-economic status,

Factor or pattern II - Family life cycle (Family status),

Factor or pattern III - Land-use gradient

Factor or pattern IV - Religions or ethnic status,

Factor or pattern V - Slum areas versus Businessmen areas,

Factor or pattern VI - cottage industry areas.

Factor I, II and IV usually bear a close resemblance to the traditional 'Social Area Analysis' constructs of Shevky-Bell hypothesis (1955) and other remaining factors (factor III, V & VI) identify special features of Dhaka's land use pattern. The above 3 factors (factor I, II and IV) are the main basic differentiation in Dhaka's urban ecology study, and other factors are important for areal configuration of the population or special features of land use patterns of Dhaka city in 1981.

4.1.1. Factor 1: Socio-economic status

The first factor is undoubtedly an index of socio-economic status or social rank. It is the main measurement of Shevky-Bell hypothesis (1955).

The Municipal wards that have high and low factor scores are mainly identified by the high and low status areas of Dhaka city. High and low loading variables are found in Table 2.

There is a tendency for the people of Dhaka city like other cities of the world to cluster in the higher social status communities and also in the lower status communities. Almost all the variables traditionally regarded in sociology as indicators of class position or social status - education, occupation and income - have either their highest or their next highest loadings on the first factor.

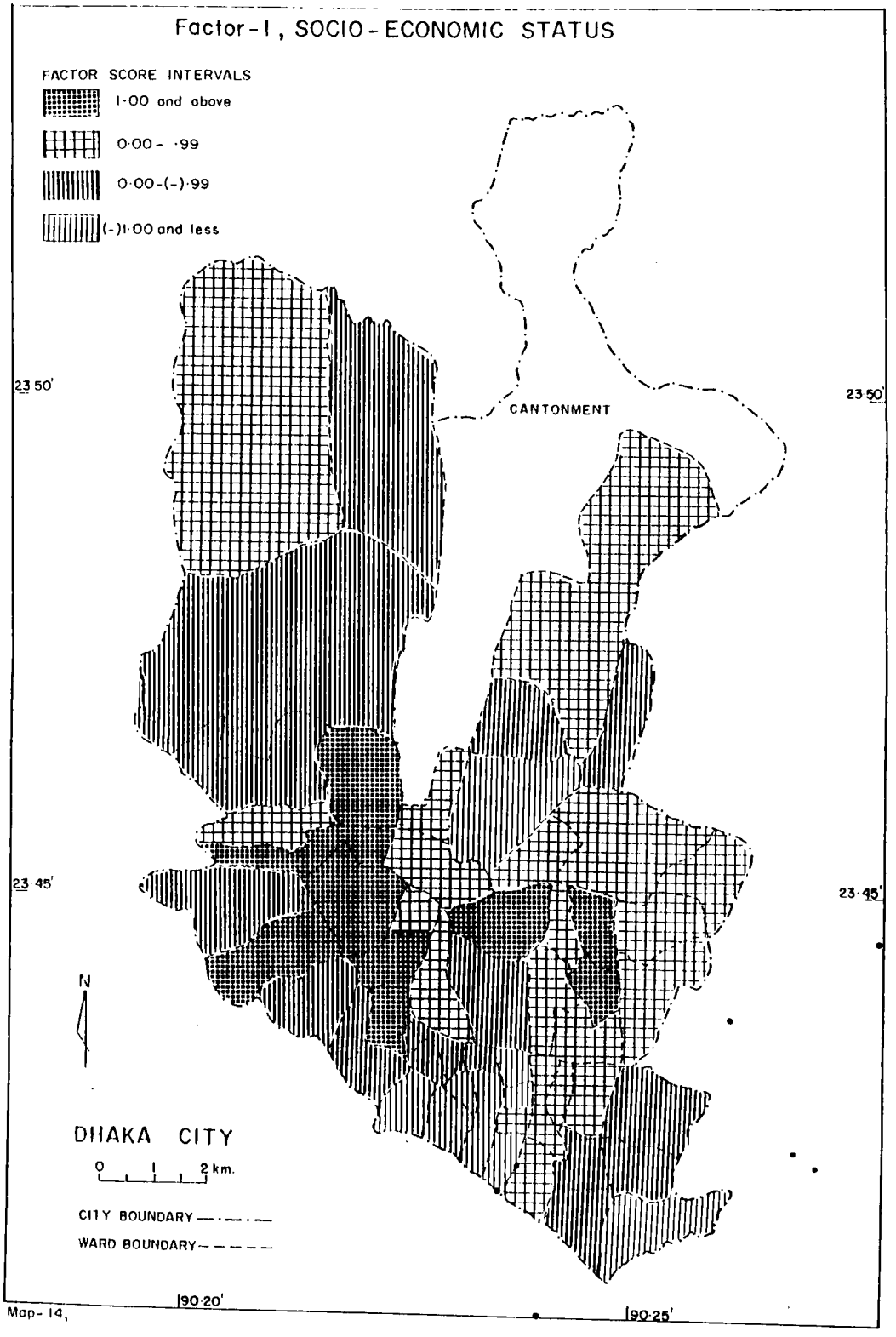
A brief description of the spatial patterns of the first factor is given below. Spatial analysis and test of the theory are also included in this description.

In this research the highest status areas are mainly found in the central city area of New Dhaka city like Dhanmondi Residential Area, Azimpur area, Dhakeswari area, Sheikh Shaheb bazar area in the southern part of New Dhaka city, Shamoli, Lalmatia, Sher-e-Bangla Nagar, Shukrabad, Sobhanbag, Jhigatola, Central road area, few areas of Shahjahanpur and Shantinagar (see Map 4.1).

Table 2: Factor - I Socio-economic Status or Social Rank

Variable's Number	Abbreviation used in Computer Analysis	Name of Variables	Factor Loading
26	PLITFL	% of literate female	+.887
30	PDEGFL	% of Degree passed female	+.831
29	PDEGML	% of Degree passed male	+.758
23	PDIVFL	% of divorced female	+.705
28	PSECFL	% of secondary (V to IX) passed female	+.532
9	POOTHW	% of occupation other works	+.496
25	PLITML	% of leterate male	+.446
15	PHHHAL	% of household having agricultural land	+.417
17	PTOODU	% of total own dwelling units	(-).554
7	POMANU	% of occupation manufacturing	(-).715
21.6 percent of the total behaviour explained			

In the suburb, Gulshan and Banani Model towns are two main high class areas located far away from the smoke and the dirt area of the city. The significant



concentration of high social status areas adjacent to the commercial and administrative urban core confirms to a pattern that would be predicted from conventional notions of pre-industrial cities while the existence of newer higher status neighbourhoods at the periphery evokes the image of suburban patterns of industrial cities of the west. It is noted that these two model towns are situated under ward No. 51 (according to 1981 census). This ward is a big ward comprising the areas inhabited by low status people, besides the high status areas of Gulshan and Banani model town the total number of low status people are more than the number of high status people of these model towns. As such highest status score is not found here. Since the creation of Pakistan in 1947, the city expanded towards the north leaving behind the former high class areas (Gandaria, Wari and Purana Paltan) due to invasion and succession processes of Burgess theory of 1925 and the high class areas shifted to Dhanmondi and Ramna area.

Actually, Dhanmondi Residential Area, Gulshan and Banani Model towns are now demarcated as high status areas of the city and the rest of the areas mentioned above belong to moderate high class status category on the basis of higher education and occupation rating among male and female population. This trend of high grade of education having graduation or higher degree are more among the inhabitants of these areas. Most of them are

employed in (other services) different services of government, semi-government or autonomous bodies and are also engaged in teaching in different schools, colleges and universities. As the above mentioned areas are the areas of high social status, the people of these areas also earn more in comparison with other areas of the city.

All types of service facilities are found in these areas. There exists good communication system with adequate number of educational institutions and markets, electricity, water supply and telephone facilities together with garbage disposal facilities. Provision for all these facilities have made these areas better than other areas of the city.As a result, these areas obtain higher rent than other areas of the city and the people of these areas have the capability to pay the higher rent. This shows that the inhabitants of these areas have more income than those of other areas of the city.

The demand for rental houses and also the rental rates have been increasing due to rapid growth of population. The growth is both due to higher rates of natural increase and also because of high rates of migration of people from different villages and small towns to the city of Dhaka. The demand for housing is increasing with the increase in population but the supply of housing is not increasing at the same rate. Consequently, there is acute shortage of housing

facilities. These shortages have further aggravated due to continuous rise in the rent and also due to the limited affordability or capability of the general people. The house rent of Dhanmondi Residential Area, Gulshan and Banani Model Town are much higher in comparison with other areas of the city. These three areas have been taken under the plan of development by Dhaka Improvement Trust (now RAJUK). Dhanmondi and Lalmatia were developed during Pakistan period from 1947 to 1970 by the Housing and Settlement Directorate of the then Provincial Government of East Pakistan. Other areas of high status group were also developed during Pakistan and Bangladesh period.

From the later half of Pakistan period to 1981 of Bangladesh period, a large cluster of commercial and business firms, offices, banks and insurance companies have been established both horizontally and vertically at Motijheel and Dilkusha Commercial Area. These areas are treated as new extension of the CBD of Dhaka city. This new extension of the CBD has been extended from Bangabandhu Avenue to Baitul Mukarram and to Motijheel area. Many government, semi-government or private offices, banks, institutions, shopping or recreational centres are located in and around this CBD of the city. Many types of multistoried buildings of different heights, sizes and colours are a common phenomenon of evaluating the high standard of this area of the city.

The plan and development of such a useful model of the CBD might have been made after Western Town Planning and architectural design (Majid, R., 1970).

Over all, these high status areas are composed of many planned and important shopping centres. They are Government New Market, Bangabandhu shopping area, Baitul Mukarram shopping complex (built during Pakistan period), Stadium shopping complex (built during Bangladesh period), Green road super market, Elephant road shopping complex, Mirpur road market, Moghbazar and Mouchak market. Other unplanned markets are also found in different parts of this status areas. All of these markets are retail shops for selling various items.

The lowest status areas are mainly found in the inner city, surrounding the older part of the CBD of Dhaka city. These are the areas of manufacturing industries of the city. During the Mughal period, these areas were the main high class areas of the Dhaka city. But now all these areas fall under the category of low status caused by invasion and succession processes (this confirm to the theory of Burgess, 1925). Other low status communities also cluster in the suburb areas of the city. In the old Dhaka city, low status areas are found mainly in Nazira bazar, Siddique bazar, Kazi Abdul Hamid lane, Lutfur Rahman and Takerhat lane, Golakpal lane, Hazi Abdullah Sarker lane, Malitola, Mogal tolly, near Armanitola, Rajani Box lane, Aga Sadek road, Aga

Mashi lane, Kazi Alauddin road, Chankhar pool lane, Methorpatti, Chikatolly, Nawabkatra, Banianagar, Kazi Abdur Rouf road, Alamganj lane, Goalghat lane, Katherpool area, Dholai khal area, Gopi Mohan Basak lane, Juriatully lane, Juginagar, Bonogram, Nagendra Nath Basak lane, Manik nagar, Kazirbag, Dhalpar, Jatrabari, Saidabad area, Faridabad area, Dhalka nagar, Hari charan Roy road, Mill barak area, Postagola, Karimullar bag area, Noorbox road area, Champatali lane, Chotokatra road area, Mitford road area, Islambag, Rahimbox lane area, Rahmatganj, Chawk bazar,Khazedewan, Urdu road area, Nuton Paltan lane area, Nawabganj road area, Subal Das road, Hazaribag Tannery area and Pilkhana bustee area.

In the newer part of Dhaka city low status areas are mainly found in Mohammadpur bustee and rehabilitation zone area, Begun bari area, Nakhal para area, Tejgaon industrial area, Tejkunipara area, Budda area, Ullan, few parts of Rampura and Mirpur bustee areas of section 10,11,12,13 and 14 (see Map 14).

In most of the low status areas, small shops and houses are used as factories to manufacture various items of iron, tin and steel goods. Some are workshops for making parts for automobiles and electrical apparatus, some are making steel almira, wardrobe and other iron made furniture and some are repairing workshops of motor cars, vehicles and other items. Many items are also produced in these small industries or factories. Some of

these items are made of plastic, such as pipe, sandal, utensils, jugs, pots, toys, corks, nets, washers, brushes etc. Aluminium ware and also iron made items of various machinery parts, locks, buckets etc. are also made here. Besides these, different types of biscuits, breads, cakes and beverages are also produced in different factories that are found in this low status area of the city.

Most of the workers of these industries live near or close to their place of work. These areas fall under negative amenity (the most polluted areas of the city, with greatest mixture of land uses, the oldest and least desirable homes) areas.

According to Burgess theory (1925), slum or low status areas develop within the zone surrounding the Central Business District (CBD). CBD is the area of high class people. As the city grows, industrial and commercial ventures take place and this area is infiltrated by industries, stores and whole sale operations. The upper income people then move out further, the low income workers come in and the new migrants join them. Since they are poor, the living conditions decline. Due to overcrowding, carelessness and destructiveness by the occupants, the neighbourhood become a slum or a low class dilapidated area.

This theory of Burgess appears to be adequate to explain the land-use pattern of Dhaka city. The concept of invasion, succession and dominance provides a useful

explanatory framework for the observed sequence of neighbourhood changes in the city of Dhaka, where rapid urban growth is fuelled by large scale migration of low status families from different districts. On this ground, the auther considers he landuse pattern prevaling from the pre-Mughal period to the Bangladesh period period in the back drop of Burgess theory.

In the pre-Mughal period, Dhaka was a small market town, where only one type of small income people or the small business men lived and there was no separate marked land-use pattern. But during Mughal period high status and low status areas were demarcated by administrative or market area or in other words like as Burgess theory, the high status areas developed in the central city till British period for the Dhaka city and low status areas also developed within the zone surrounding the CBD(see Map 1 and 8).Later they developed sectorially to the periphery. During Pakistan and Bangladesh period, with urban growth, the high status areas expanded axially along the highways near the suburb areas with accessibility for living in a good area (non industrial area, higher ground etc.).

As a result, the vacant high status areas are occupied first by middle status people whose housing are in turn occupied by lower status household. At the end of this chain of movement, the vacancies created by the lowest status groups are either demolished or occupied by

low-status in-migrants. Subsequently, as other residential areas also expand outwards, the sectorial structure of the city was preserved, with zonal components emerging as a secondary element because of variations in the age and condition of the housing stock. In the case of Dhaka city, the high status areas of British period, changed into middle class and then went into low class category of land-use patterns during Pakistan and Bangladesh period. Due to the filtering process described above, low status areas of factor 1 was one time the high class areas of the city (during Mughal period) and the high status areas shifted northward far from the polluted areas of the inner city. As such low status people or slums are more concentrated in the older parts of Dhaka city. These low status people are the main workers of the manufacturing industries or factories. Some of the workers have low level of education and some have no education at all. Most of the owners of these industries use the ground floor of their own residence for manufacturing purposes. As the old part of Dhaka city is densely populated and overcrowded, it is imposible to find any vacant space for these new industries. As a result, most of these small manufacturing factories have been established in ground floor of their own residence. Most of the owners of these factories are rich but do not want to leave their homes in this locality to better areas. One of the

reasons that they like to live in their own locality is familiarity with the areas and they want to stay near their friends and relatives. As such this low status area is different from other parts of the city.

The middle status communities occupy the rest of the populated area of the city. Middle income group are those people whose (Head of the household) monthly income is between Tk: 3000 to Tk. 20,000, whereas upper income groups are those whose (Head of the household) monthly income is more than taka 20,000 and lower income groups are those whose (Head of the household) monthly income is below taka 2000 (Islam, N. 1985. p. 37).

As a whole, the social status pattern of Dhaka city goes against the concentric pattern of urban land use. Also as in a pre-industrial city, the functional and residential areas of Dhaka city lack a clearcut differentiation. No true zonal divisions exist in the city of Dhaka. All three classical patterns coexist in Dhaka city.

4.1.2. Family life cycle or Family status pattern

An entirely different set of variables load on the second factor. The high and low loading exhibited by the variables, family size and house type quality identifies the stage in the life-cycle also called family status of a population group of the Dhaka city. Municipal areas which score highly on this dimension are the areas of

residence for families of fairly large size (with more family members), who live in pucca houses near the central part of the city. They are mainly the old aged families and some of them is living in their own houses (see Table 3).

Other communities which score low on this factor, are found in the suburb area or near work place of the city. The population of these communities mainly consists of young aged families with few children who live in

Table 3: Factor (Pattern)-II Family life cycle or Family status

Variable's Number	Abbreviation used in Computer Analysis	Name of Variables	Factor Loading
22	PT5TO10P	% of 5 to 10 persons in a household	+.943
14	PTOPAH	% of total pucca house	+.695
17	PTOODU	% of the own dwelling units	+.424
13	PTOSPH	% of the total semipucca house	(-).512
20	PDUWIP	% of dwelling units with one person	(-).696
12	PTOKH	% of total kutcha houses	(-).736
21	PT2TO4P	% of 2 to 4 persons in a household	(-).917

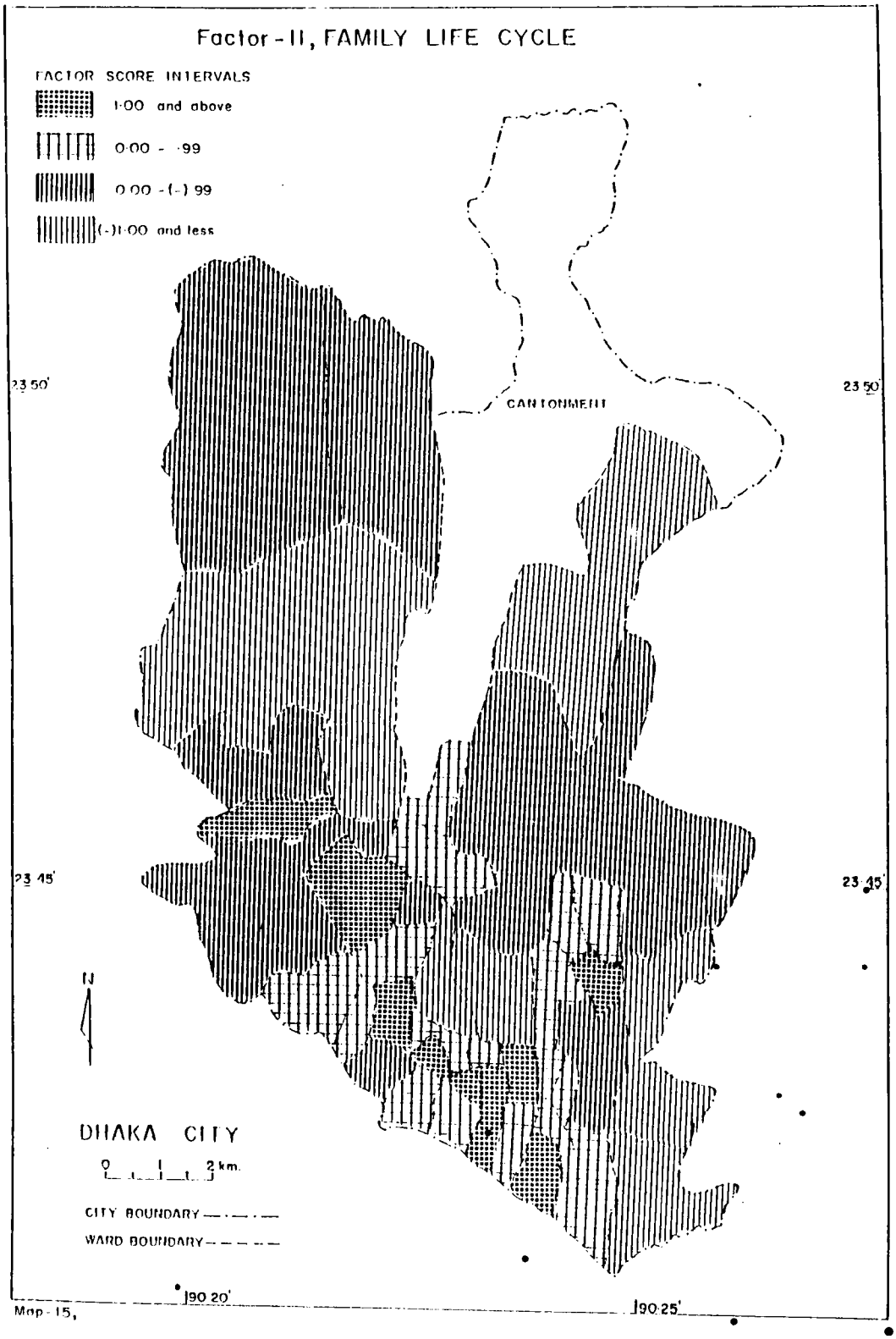
16.7 percent of the total behaviour explained.

kutcha and semi pucca houses. Also single persons mainly live in these low score areas.

According to Abu-Lughod (1969) the subareas within the city are differentiated in their likeness and capability by families of diferent types. In other words, when a family seeks a home they look for many things. The prime decision related to seeking a dwelling units is its price and type, determined by socio-economic attainment and by the family's needs at the different stages of the life cycle during which the choice is made. As such the older families living in multi-unit structure and are found in the central city area while the younger families like to live near suburb areas of the city. The spatial pattern of factor II, is displayed in Map 15.

However, young families also live in certain parts of the inner city. To purchase a single family home or a piece of land in the central city area requires more money which is impossible for young families to have. As such most of them live in rented houses.

Old aged families have many children and they have capability to live in better houses of inner city which are found mainly in Dhanmondi Residential Area, Kalabagan, Lalmatia, Mohammadpur area, Elephant road area, Lalbagh area, Azimpur area, Motijheel area, Khaze dewan road area, Armanitola, Zindabahar, Siddique bazar, Bangshal and Gandaria. In these areas most of the houses are pucca in structure (both at old and new Dhaka city).



The rent of these houses are much high as compared with other areas of the city. Most of the pucca houses in Dhanmondi and Kalabagan area are large in size. The houses in old Dhaka were built during the Mughal and the British period without any approved plan from the government. As a result they are found to be very weak in structure. Narrow roads, narrow space and unhealthy conditions are the main characteristics of old Dhaka city residential areas. Besides these buildings, some spacious decorated buildings are also found. The owners of these buildings are rich and they also live there. Because they like to live with their friends and relatives and also they are familiar with the areas.

Low score areas of factor II, are also found in the suburb and low status areas of the city. In most cases, it is found that single person and medium size family live in these areas. These areas are mainly found in Agargaon, few parts of Sher-e-Bangla Nagar, Mohammadpur, Mirpur, Paikpara, Kallayanpur, Shenpara Parbata,Fulbaria,University campus bustee area,Mugdapara, North Jatrabari, South Jatrabari and Mir Hazaribag area. The single persons are mostly those who have kept their family members in their villages and live along in single rooms of low rent tenements. They are mainly low paid service holders, petty businessmen and even students belonging to different educational institutions.

The spatial pattern of the factor, stage in the life cycle, is not generally concentric mainly in the older and inner parts of Dhaka city, because of the intermixture of residential and commercial centres in those parts of the city. The distribution of communities by the stage in their life cycle is reflected in the variation in housing type with distance from the centre of the city. In the center land values are much higher whereas further from the city centre land values are lower with more kutcha and semi-pucca houses, more predominantly single family homes which formed the concentric pattern of factor II.

4.1.3. Land use Gradient

This factor mainly identifies the core and suburb areas of the city. Core area with high score is mainly dominated by male population. Areas having males with different educational achievements engaged in different institutions, offices, banks, schools and colleges of the city are identified by this factor. These high score areas are mainly the job-rich commercial core areas and other commercial areas of the city. Many religious institutions, educational institutions, hospital, jails, churches, temples, courts, offices, banks etc. are found in these areas. Besides these, a few business, industrial enterprises are also located there (see Table 4 and Map 16).

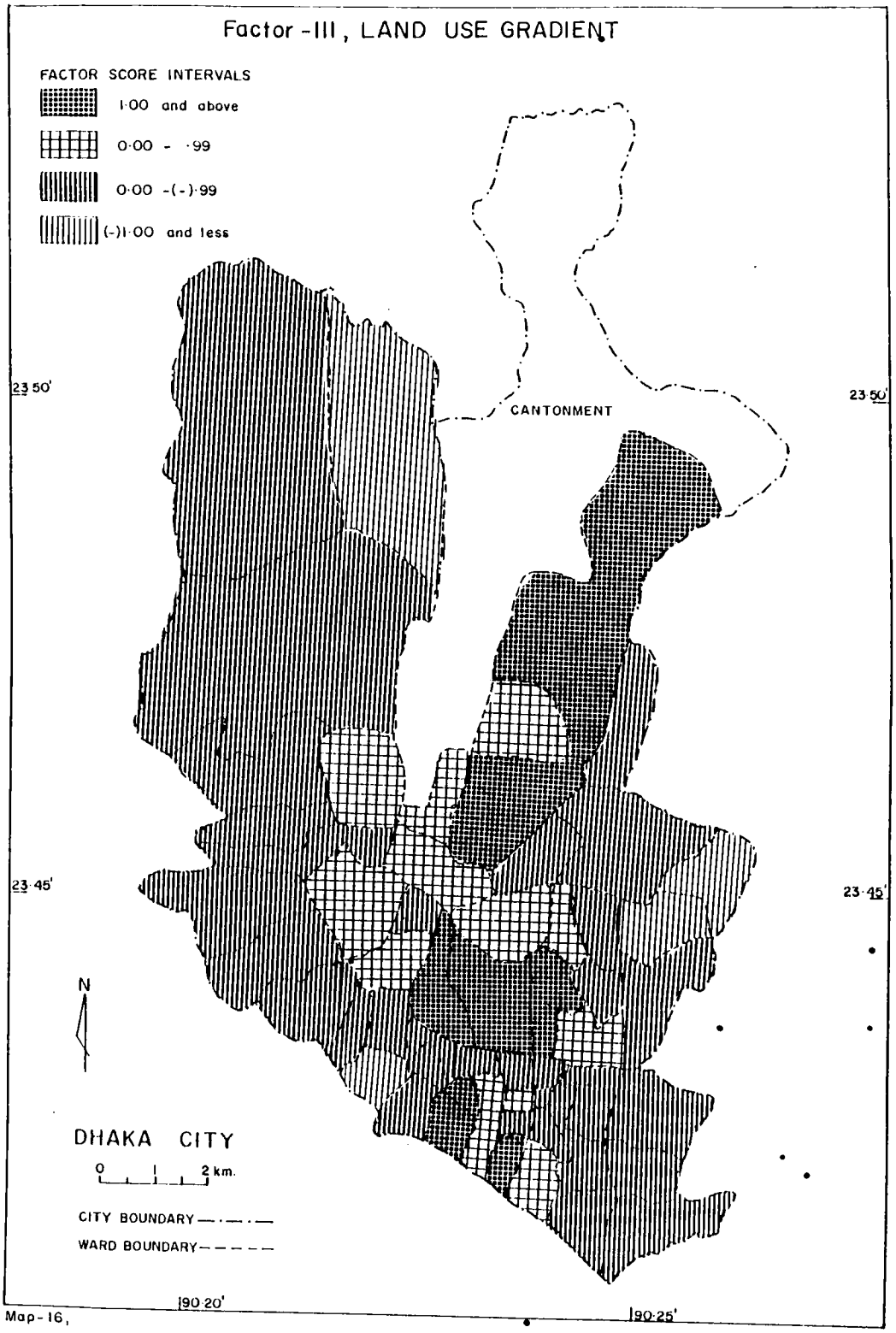
Table 4: Factor (pattern)-III Land use gradient

Variable's Number	Abbreviation used in Computer Analysis	Name of Variables	Factor Loading
10	PTOINS	% of total institutions	+ .839
25	PLITML	% of literate male	+ .821
27	PSECML	% of Secondary (V to IX) passed male	+ .739
9	POOTHW	% of occupation other works	+ .673
31	PFLOPOP	% of floating population	+ .533
29	PDEGML	% of Degree passed male	+ .420
11	PTOBIN	% of total business industry	+ .417
4	POCHHD	% of occupation household work	(-).886

11.9 percent of the total behaviour explained.

The people living here are mainly of middle class categories. Some of them have left their families back in villages and live in bording houses. They usually visit their village homes during the holidays.

These high score areas of the city are mainly found in the Ramna area (University campus area, BUET area, Pallasy), Fulbaria, Fakirapool, Arambag, Noya Paltan



Map - 16,

area, Farmgate area, Kawran bazar area, Tejgaon, Mohakhali, Gulshan commercial areas of New Dhaka city. In old Dhaka city, high score areas are mainly found in Sadarghat, Bangla bazar, Patuatoli, Chotokatra area, Armanitola and areas surrounding these areas.

Low score areas of this factor are found in the suburb areas of the city where female are dominant in number. They are mainly engaged in household work as they are mostly illiterate. Their concentration is found mainly in the fringe areas of Goran, Bashabo, Maniknagar, Jatrabari, Mirpur section 10,11,12,13,14 and other surrounding areas and in the old Dhaka city - Lalbagh, Shahidnagar and Islambag areas. Most of these females are of married, widowed and divorced categories and they are mainly engaged in household works of other middle or high class families of these areas. They usually live in kutcha or bamboo made houses in the suburb areas of the city. Some of them have migrated from rural areas in search of money to maintain their families back in their villages.

4.1.4. Religious or Ethnic Status

The 4th factor to emerge from the analysis isolates the religious communities which can be generally compared with ethnic status (according to Shevky-Bell hypothesis, 1955) and which can be superimposed upon the cluster structure created by the combination of sectorial

and concentric pattern (Murdie, 1967). Spatial units that score high on this factor contain residents who predominantly belong to Hindu religious groups or communities and municipal areas with low score of factor loading are muslim religious group who are majority in most areas of the city. Spatial segregation of religious groups of Dhaka are dominant among the Hindu population (see Table 5 and Map 17).

Hindu majority areas are mainly found in the Court area, Tanti bazar, Bangla bazar, Patuatuli, Sadarghat,

Table 5: Factor (pattern)-IV Religious status or Ethnic status

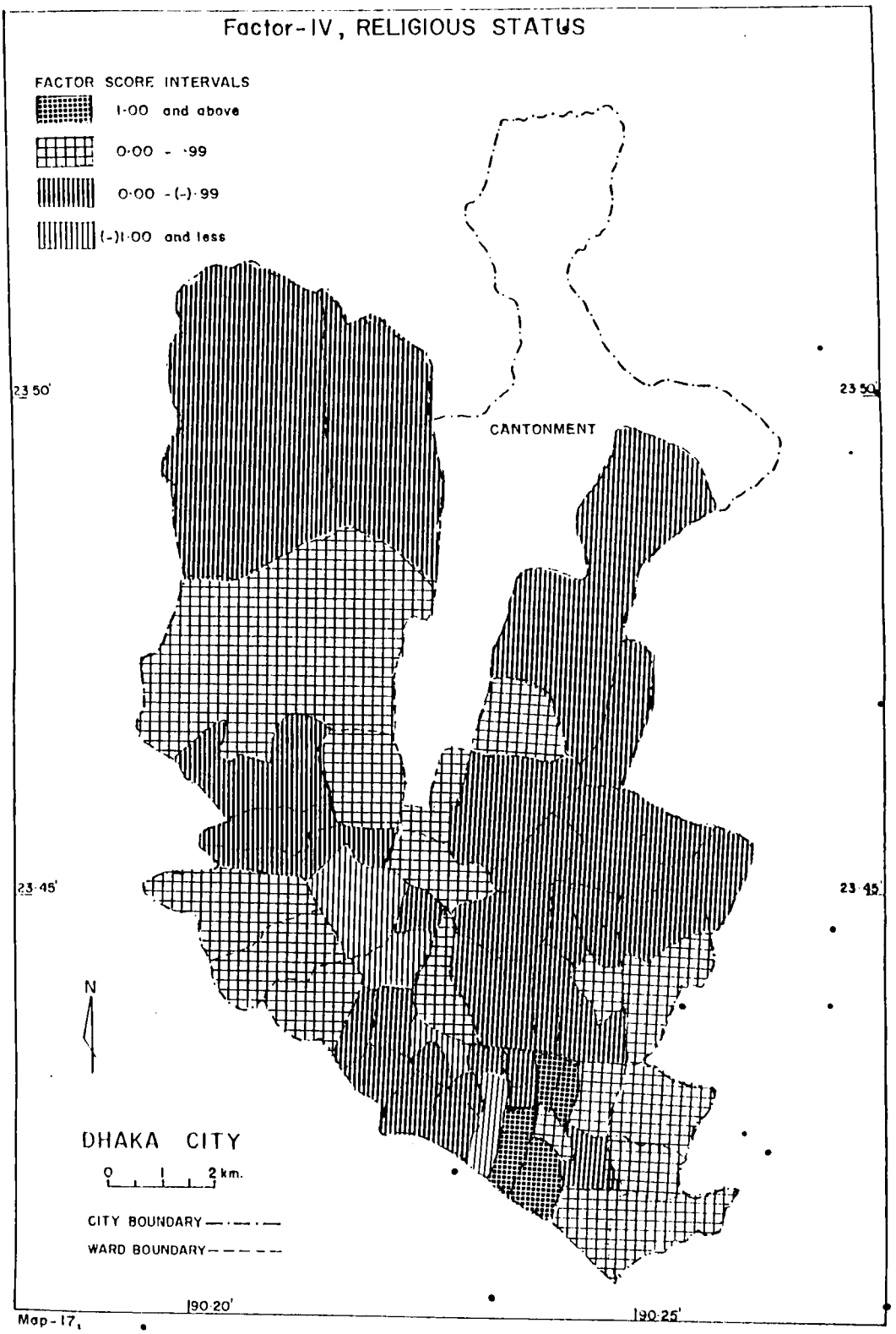
Variable's Number	Abbreviation used in computer analysis	Name of variables	Factor loading
2	PHIN	% of Hindu population	+ .940
1	PMUS	% of Muslim population	(-).937
6.8 percent of the total behaviour explained.			

Shakhari patti, Noyabazar, Forashganj, Hemantakumar Das road area, Mohini Mohan Das lane, Patla khan lane, Sirish Das lane, Rupchand lane, Ruplal Das lane, Bania Nagar, Kazi Abdur Rouf road, Alamganj lane, Goalghat lane, Bhojohari Shaha street, Kather pool area, Nandalal Datta lane, B.C.C.road area, Captan bazar, Gopi Mohan Basak

lane, Juria tully lane, Jugi nagar, Bonogram, Nogendra Nath Basak lane, Nawabpur area, Hari lane, Hare street, Joykali Mandir area, Lalmohan shah street, Guru Das lane, Rankin street, Sutrapur area, Mettorpatti area and Gandaria of old Dhaka city. A few concentration of Hindu population are found in Kallayanpur, Paikpara, Shenpara purbata, Mohakhali, Ramna area, Rayerbazar, Hazaribag, Lalbagh, Faridabad, Jatrabari and Wari area(See Map 17).

Most of the Hindu people have been living in Dhaka from the pre-Mughal period. In other words oldest inhabitants of Dhaka were the Hindus. Their concentrations were then found in Luxmibazar, Shankhari bazar, Kumartali, Tantibazar,Bania nagar, Jalua nagar areas. They were mainly low caste Hindus.

Their concentration were more during Mughal and British period of Dhaka city. As such the name of many lanes and bylanes and places of old Dhaka city bear the name of the prominant Hindu leaders. Most of the Hindu high class people and other status Hindu people migrated to India from Dhaka after the partition of British India in 1947 (after the independence of Pakistan in 1947). A large number of Muslim also migrated to Dhaka from India at that time. Now Dhaka is a Muslim dominant town but during Mughal and British period it was a town of Hindu majority. In those days and even after, these Hindu people were mainly engaged in business. But after the independence of Bangladesh, the remaining Hindu family



migrated to India from Dhaka for political reason and social unrest. Only the low caste Hindu people are now found in different parts of Dhaka city who mainly engage as weaver, fisherman, mali, dom, sweeper, carpenter etc. A few literate Hindus are engaged in teaching at different schools, colleges and universities. Gold business of Islampur, cloth business of Patuatully, Conch shell business of Shakhari bazar, Pottery making industry of Rayer bazar are some well reputed business of Hindu families of Dhaka city from Mughal period to Pakistan period. Most of the wealthy and rich Hindu people of Dhaka city exchanged their property with the Muslims of India and left Bangladesh for India during Pakistan and Bangladesh period.

Besides the Hindu religious group, other religious groups of people lived at Dhaka from the Mughal period. They were mainly Christians, Buddhists, Armenians,Greeks, Shikhs and Portuguese, most of these people left Dhaka during the British period. Many temples, churches and pagoda are found in different parts of Dhaka city. Among them Joykali Mandir, Dhakeswari Mandir, Baptist church, Tejgaon Christian church and Kamalapur Buddha Mandir are famous. All these bear the symbol of past Hindu, Christian and Buddhist worshippers of Dhaka city. The unusual little Greek Memorial inside the Dhaka Univesity Teacher-Student centre, also bear the symbol of Greek worshippers during the British period of Dhaka city. The

zones within the segregated area occupied by the minority groups do not have the same life-cycle pattern as other zones of the city, the segregated areas are a microcosm of the whole city pattern.

Other low score factor loading areas of the city are found in those areas where Muslims are in the majority. Major parts of New Dhaka city such as Dhanmondi Residential Area, Green Road, Kalabagan, Central road, North Dhanmondi, Cresent road, Kathalbagan, Elephant road area, Science Laboratory area, Chawkbazar, Khaze dewan, Urdu road area, Barakatra area, Islambag area, Rahim box lane area, Rahmatganj, Noor box road area, Armanitola, Kazi Abdul Hamid lane, Lutfur Rahman and Takerhat, Nazira bazar, Siddique bazar, Golakpal lane, Hazi Abdullah Sarker lane, Malitola, Moghal tolly, Chamily bag, Gulbag, Malibag, Shantibag, Rajarbag, Shanti Nagar, Tejgaon area and Nakhalpara, Rampura, Begun bari, Khilgaon, Fakirapool, Arambag are the Muslim areas of the city. Most of these Muslims are 'Bengali' speaking. Some 'Urdu' speaking Muslims known as 'Bihari refugees' who came from India during the time of partition of India, reside in Mohammadpur and in the Mirpur area (at section 10, 11 and 12). Since the independence of Bangladesh, these people have been trying to migrate to Pakistan and the government of Bangladesh is also trying to send them to Pakistan.

4.1.5. Slum Area Versus Businessmen Area

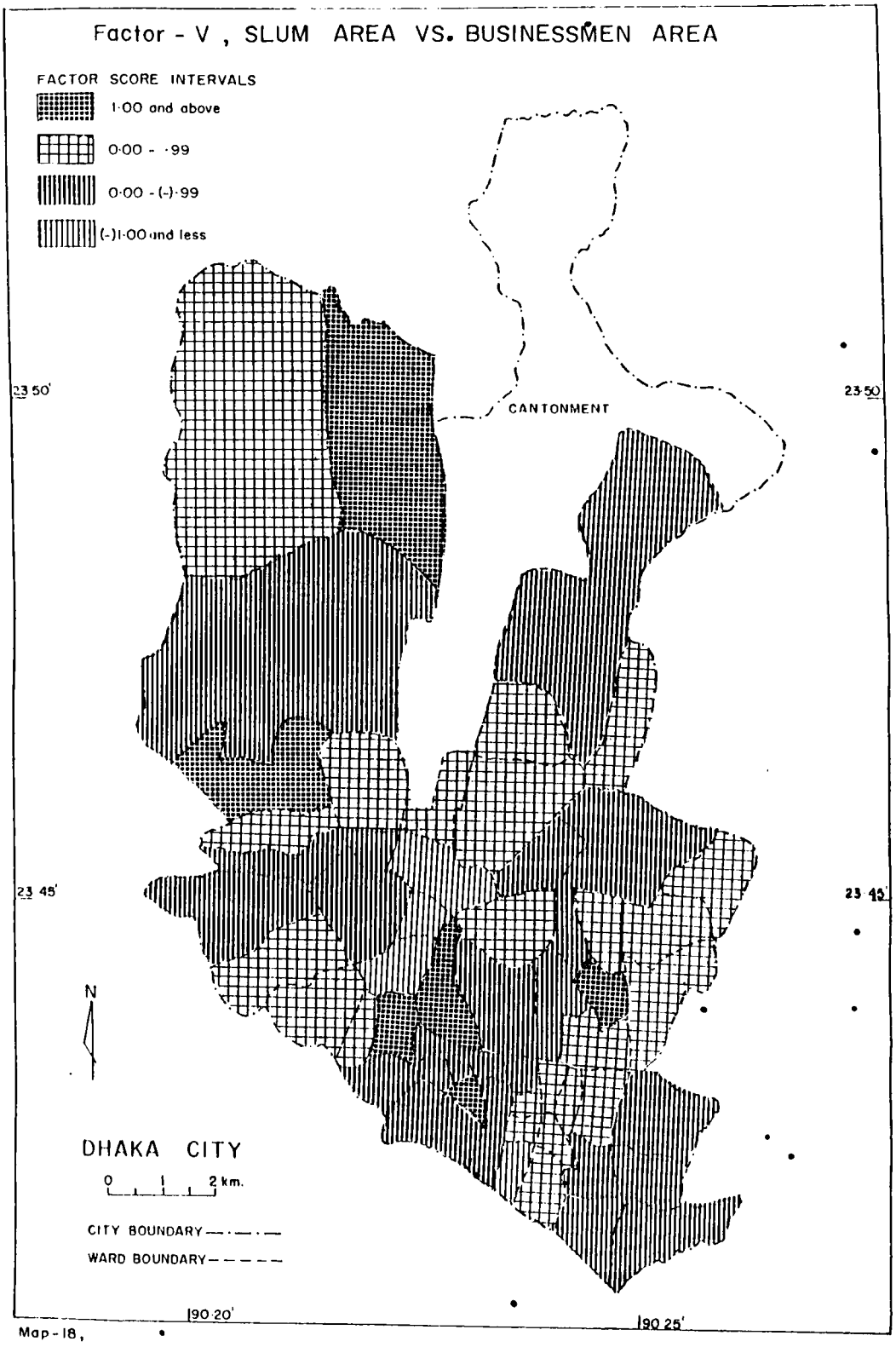
High score areas of this factor are found in the newly developed areas where unemployed persons are more frequently found. And low score areas of this factor are found where most of the people are engaged mainly in business activities and some industries are also located there (see Table 6 and Map 18).

Most of the unemployed people live mainly in vacant land of middle and low class areas of the city. Their concentration are more in different parts of slum areas of Agargaon, Shamoli, Mohakhali, Lalbagh, Azimpur, Ramna area, University campus area, footpaths of different roads, vacant lands and houses owned by the

Table 6: Factor (pattern)-V Slum area versus Businessmen area

Variable's Number	Abbreviation used in computer analysis	Name of Variables	Factor Loading
3	POCNOTW	% of occupation not working	+.860
19	PTORFDU	% of total rent free dwelling unit	+.423
8	POBUSI	% of occupation. Business	(-).610
10	PTOBIN	% of total Business industry	(-).491

6.1 percent of the total behaviour explained.



Map - 18,

government, Kamalapur railway station bustee area, Shahjahanpur, Mugdapara, Goran, Maniknagar, Dholai Khal area, Jatrabari, Kather pool, Islampur area, Islambag and other parts of the suburb areas of Dhaka city. Most of them had recently come from villages to seek jobs. They are mainly the landless agricultural labourers of different villages and they reside in slum or bustee areas or roadside kutcha houses and these areas are mostly thickly populated areas of the city. A few rent free dwelling units are also found in these high score areas of the city. These people do not have to pay any rent as they are occupying the dwelling units which belong to their friends or families or they are permitted to stay there in lieu of different types of services rendered by them. Slums have grown in many parts of Dhaka city wherever vacant lands are available. There is no clearcut separation between the slums and the other better residential areas of the city.

Areas having low score of this factor are mainly found where majority of the people residing in the area are engaged in business activities (doctors and lawyers also include in this category) and in these location some business and manufacturing industries are also located.

In new Dhaka city residences of businessmen are found mainly in Elephant road area, Science laboratory area, Kathal bagan, Kawran bazar, Farmgate, Tejgaon area, Malibag, Maghbazar, Dhanmondi Residential Area, Raja

bazar, Gulshan and Banani Model towns, Rampura, Khilgaon, Fulbaria, Purana Paltan, Baitul Mukarram area, Stadium area, Kallyanpur, Paikpara and Senpara Parbata etc.

In old Dhaka city, businessmen residential area are found mainly in Chawk bazar, Bakshi bazar,Hosni Dalan area, Islampur, Nazira bazar, Siddique bazar, Noya bazar, Bangla bazar, Patuatoly and Sadarghat area of the city. In these areas the residential houses of the businessmen or merchants are usually situated near their working place. As such retail, wholesale and residential activities are intermixed in the old Dhaka city. In most of the cases ground floor of these houses are used as business shops and upper units are used for living purposes. Chawk bazar, Moulvi bazar, Islampur, Patuatoli, Sadarghat, Bangla bazar,Noya bazar and Nawabpur are some important business centres of Dhaka city. Wholesale market of Chawk bazar, Moulvi bazar, cloth stores of Patuatuly, jewellery shops of Islampur, book shops of Bangla bazar are important business centres of old Dhaka city. Most of the lanes and bylanes of old Dhaka are mainly narrow, as such traffic jam is one of the main problems of old Dhaka city. These narrow roads and lanes are only suitable for rickshaws, push carts and small vehicles but not for big vehicles, when all these vehicles ply at the same time traffic jam occurs.

Along two sides of the roads and lanes of old and new Dhaka city various manufacturing or business shops,

doctors' chamber, lawyers' chamber and various types of industries are found. Retail shops, offices, banks, hotels, restaurants, cinema halls are also situated in these areas.

In new Dhaka city, most of the business centres are planned and do retail business. Cloth shops, general stores, big electronic shops, household and crockery shops, furniture shops, jewellery shops, watch stores and repairing shops, fancy goods shops, optical shops, musical instrument shops, photographic studios, banks, high class restaurants, chinese restaurants and cinema halls are main elements of businessmen residential areas of new Dhaka city.

Most of the homeowners and also big businessmen live in Dhanmondi Residential Area, Gulshan and Banani Model towns. Other businessmen and most of the workers of the business centres of both old and new Dhaka city live near their work place and a few live in distant places of the city according to their ability to pay rent. Business centres of new Dhaka are suitable for female buyers as there are good marketing facilities and also better transport facilities in new Dhaka city than in old Dhaka business areas.

4.1.6. Cottage Industry Area

This factor identifies those areas where homes are also used as cottage industries. Cottage industry is

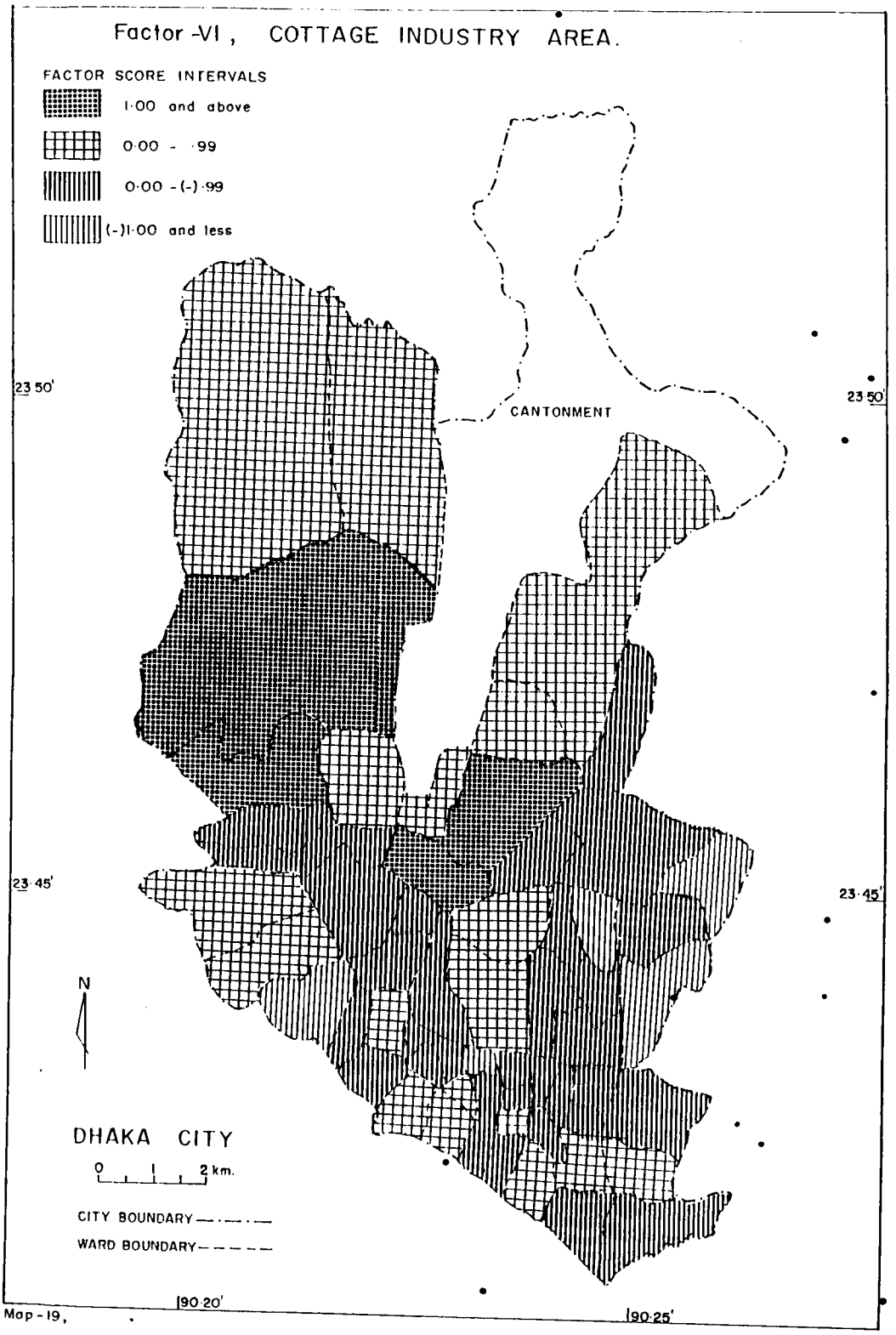
mainly based on mannual labour and its products are sold in different markets. Different items of hand made products, such as bamboo and cane made household items, decorative items, jute made items, clothing, embroidered dresses, earthen toys and dolls are included as cottage industry products. Other important cottage industries are pottery, hosiery, blacksmith factory, saw mills, oil and flour mills and furniture works. These are situated in different parts of Dhaka city (see Table 7 and Map 19).

These industries are mainly found in residential houses of Mirpur, Mohammadpur, Rayer bazar, Jigatola, Monipuripara, Tejkunipara, Tejturi bazar, Rajabazar, Kawran bazar area, Begun bari, Nakhal para, Tejgaon industrial area, Minto road area, Eskaton and Bangla

Table 7: Factor (Pattern) - VI - Cottage industry area

Variable's Number	Abbreviation used in Computer Analysis	Name of Variables	Factor Loading
16	PHHHCI	% of household having cottege industry	+ .862
19	PTORFDU	% of total rent free dwelling units	+ .516
24	PDIVML	% of total divorced male	+ .433

5.1 percent of the behaviour explained.



Map - 19,

motor area of new Dhaka, Gandaria, Distifery road area, Chotakatra, Champatali lane and Mitford area of old Dhaka city are also important centres of cottage industry of the city. These areas are also characterised by substantial number of divorced male in the population. Various organizations of female workers headed by female owners are found involved in different cottage industries of the city. They export the produced items to foreign countries and earn huge amount of money. Various items of these cottage industries are also sold in different markets of the city. Some workers, both male and female, of these cottage industries also live in rent free dwelling units which are arranged by the owners for the workers accomodation. Most of the workers of cottage industries are paid low wages for their work. Various exhibitions are held by different organizations of the city. Some female organized bazar's known as 'Mina Bazar' are also held in the city throughout the year for selling the items of cottage industries.

Thus the author may state that the factors which determine the spatial pattern of Dhaka city differ from those of the western cities. But these same factors would be expected in many cities of the developing countries. However, the mosaic created by the social environment of the city is similar in some respect to ecologies found in both western and non-western cities.

The above results indicate only the ecological

picture of Dhaka's social environment of 1981. As a developing city, a strong clearcut urban land-use pattern is yet to develop. This is a symptom of developing cities especially in developing countries which are in transition to urbanization.

Traditionally, the social status varies principally by spatial sector following Hoyt's sector pattern, family status follows Burgess's concentric pattern and ethnic status spreads in a segregational pattern as proposed by Firey and other sociologists.

Urban spatial areas of Dhaka city mainly differ from western societies as was predicted by Shevky-Bell (1955). Social status (social rank), family life cycle (family status) and religious status (ethnic status) respectively play important role in the formation of urban pattern of the city. Every year, large number of migrants create additional number of bustee areas in the city, which adversely affect the social environment of the city. Other factors identify specific areal configuration of the population of the city in 1981.

Moreover, each census wards or residential area itself contains a variety of physical facilities in the form of land, roads, services and dwellings. These dwellings vary in age, structure and condition and once established provide relatively fixed characteristics and partially determine and influence the social and ecological characteristics of the present structural

stratification of the city.

Most studies in America and Western Europe usually isolate at least these three (socio-economic status, family status and ethnic status) dimensions or constructs, while many studies from Eastern Europe have failed to identify the ethnic status dimension. The evidence from studies on cities in developing countries is that family status and socio-economic status are not weakly independent variables but also that the socio-economic status is the more important criterion for segregating households. Additional determinants such as migrant status, ethnic status in areas of powerful poly-ethnic hinterland and caste and religion, especially in India, have been suggested (Friedman and Wulff, 1972).

Abu-Lughod (1969) analysed Cairo in which the first factor was identified as representing "style of life" which had close association between certain variables of urbanization or family status and variables of social rank or social status. Mc-Elarth's (1962) study of Rome had also found high correlation between socio economic status and family status.

Indian cities like Calcutta (Berry and Rees, 1969), Poona, Bombay, Kanpur, Sholapur (Berry and Spodek,1971), Ahmedabad (Weinstein and Vijayan's, 1978) and Madras (Weinstein, 1974) showed a dominant socio-economic status, a fading but still dominant caste status which is being replaced by economic, class status and a

familism gradient showing familial peripheries as against core areas housing mostly single male population. It is of some interest that the closest resemblances of Calcutta's ecology are to the ecology of cities in the American South, where traditionally one finds link between race and status in a system of caste (Bose, 1961).

Abu-Lughod and Mc-Elarth explained these characteristics and argued that there is a high correlation among social rank, family status and ethnic status in a pre-industrial city and low correlation or they become separated in a modernized city.

On the basis of the above results of 'Factorial Ecology' method, Dhaka seems to be a modernizing city where social status (Factor I) and family life cycle (family status, Factor-II) religious status (factor IV) seems likely to be much more identifiable and more accurately reflected in the urban spatial structure of Dhaka city as in western cities.

With growth and expansion of the centre and with radical improvements in transportation and communication facilities, the upper strata have shifted from central to peripheral residence, and the lower classes have increasingly taken up occupancy in the old central areas of Dhaka city.

As a result the present manufacturing belt areas of old Dhaka city have low status characteristics of a

modernizing city. The geographical and historical frame work of the city is also important keys for understanding the diversity of the spatial patterns in 1981 of Dhaka city and it is justified to say that the whole urban structure of Dhaka city is an intermixture of characteristics of both developed and developing countries of the world.

CHAPTER 5

CONCLUSION

5.1. SUMMARY, RECOMMENDATION AND CONCLUSIONS

The whole research embodies an ecological study. It provides a deeper understanding of the socio-economic changes that has occurred in the city of Dhaka in 1981.

The main aim of this research was to identify and to explain spatial socio-economic differences within the city. The present land use pattern of Dhaka city has been compared with the traditional classical pattern, that is concentric zonal, sector and multiple nuclei patterns as postulated by human ecology and geography. In other words, this is a study of socio-economic spatial structure of Dhaka city. This has been accomplished by using the method of 'Factorial ecology'. The final aim was to construct a spatial typology using a matrix of factor scores of varimax rotation of factor analysis.

Since the key elements shaping urban spatial structure are the people, their differentiation and their grouping, many variables are closely related to population characteristics such as population structure, sex, occupation, marital status, social structure, family household characteristics and religious affiliation of the inhabitants. Another basic element of urban spatial structure is the quality of housing.

The spatial distribution of various factors resulting from factor analysis solution are in order of magnitude (1) Socio-economic status (2) Family status or family life cycle (3) Land use gradient (4) Religious status (5) Slum versus Businessmen areas and (6) Cottage industry areas. The above factors have impact on different socio-economic indicators which creates the areal differentiation in Dhaka city. These various subareas have specialized characteristics and are tied together by the relationship of various socio-economic and urban functional considerations.

In this research, the most important factor was found to be the Socio-economic status factor. This factor indicates the areas of high versus low status areas of the city and it is a highly significant factor for different areas within the city. High status areas are mainly found in the central city, mainly in Dhanmondi R/A, Elephant Road area, Lalmatia, one block of Sher-e-Bangla Nagar, Shedheswari,Motijheel and some parts of North-Shahjahanpur and in the suburb areas mainly in Gulshan and Banani Model town. The existence of high status areas in the periphery evokes the image of suburban pattern of industrial cities of the West and the existence of high-status areas near the commercial and administrative core of the city confirms to a pattern of pre-industrial cities.

Overall these high status areas are composed of

many planned residential, commercial and important shopping centres of the city. The low-status areas which are mainly found in old Dhaka city are the main manufacturing areas of Dhaka city (see Map 14). New Dhaka's low status areas are mainly found in Mirpur-Mohammadpur rehabilitation zone and bustee areas, Tejgaon industrial area and other surrounding areas and the northern, western, eastern and southern parts of the periphery and suburb areas of the city.

The low status areas of old Dhaka city are the most polluted, overcrowded and densely populated areas of the city. The greatest mixture of land uses, the oldest and least desirable homes and slums are more concentrated in old Dhaka city areas. Separate patterns are not discernable in these residential areas.

The Family life cycle or Family status is the second most important factor. This factor differentiates the city areas on the basis of different stages in the family life cycle. It also indicates the distribution of old-aged families versus young aged families. Old-aged families have many children (5 to 10 persons) or more family members and live in pucca houses near the central city areas whereas young-aged families have few children (2 to 4 persons) or less family members and they mostly live in Kutcha and semi-pucca houses in suburb areas or near their workplace. Single person households are mostly found in suburban areas.

These findings indicate that old-aged families are richer than the young-aged families. As such, most of the young-aged families live in Kutcha and semi-pucca houses. The spatial pattern of this factor is not concentric in older and inner parts of old Dhaka city but in New Dhaka city, this factor mainly formed a concentric pattern (see Map 15).

The third important factor is the Land use gradient, which focuses the core versus suburb areas and also identifies the male dominating areas of core versus female dominating areas of suburb areas of the city (see Map 16). Males are mainly engaged in different schools, colleges, institutions, banks and offices located at the core or around the central city areas which are the main rich commercial areas of the city. Females are mainly engaged in household work mostly in suburb areas.

Most of these males and females are migrants and come to Dhaka city from various rural areas in search of employment to maintain their families back in the villages. Floating population and some business houses and industries are also found in the core areas of the city. This factor is important for areal distribution of population of the city in 1981.

The fourth factor is the Religious status factor which generally compares with ethnic status of Shevky-Bell (1955) hypothesis. Hindu majority people versus Muslim majority people areas is reflected in this factor.

Few parts of old Dhaka city are dominated by people belonging to the Hindu religion. These are Tantibazar, Bangla bazar, Shakhari patti, Patuatoli, Sadarghat, Gandaria, Wari, Bangshal, Narinda, Sutrapur and Methorpatti areas. A few concentration of Hindu population are found in Kallayanpur, Paikpara, Shenpara Parbata, Ramna area, Rayer bazar, Hazaribag, Lalbagh and Jatrabari areas of Dhaka city. Most of the Hindu people belong to low caste and are mainly engaged as weavers, fishermen, mali, dom, sweeper and carpenter. A few Hindu people are engaged in teaching in different schools, colleges and in offices. Some of them are also engaged in business activities in old Dhaka city areas. Besides the Hindus, Buddhists, Christians and other religious groups of people live in Dhaka city scattered in different localities. The spatial pattern of the Hindu majority areas form a cluster pattern.

Rest of the areas of the city are inhabited by Muslim religious group. They are mainly 'Bengali' speaking people. Some 'Urdu' speaking Muslims known as 'Bihari refugees' are also found in the Mirpur and Mohammadpur areas (see Map-17).

The 5th factor of factor analysis of this research is the slum areas versus Business men area of the city. In other words unemployed persons areas versus areas of Businessmen are indicated by this factor. Most of the unemployed persons had come to Dhaka recently about six

months ago from villages, in search of better jobs and lived mainly in bustee areas of middle and low class areas of the city. Bustee areas are found in Agargaon, Shamoli, Mohakhali, Lalbagh, Azimpur, Ramna area, University campus area, footpaths of different roads, vacant land and houses owned by government, Kamalapur railway station, Shahjahanpur, Mugdapara, Goran, Maniknagar, Dholai khal area, Jatrabari, Islampur, Katherpool, Islambag and other parts of suburb areas of the city (see Map 18). The poor in-migrants who inhabit these areas cannot afford to pay rents charged in the inner zones. As such, they construct thatched-bamboo kutcha houses on the footpaths, railway station and other vacant lands of the city area as it is cheaper and easier for them to do so. These bustee areas are thickly populated and unhygienic condition prevails there. Slums grow in different parts of the city where vacant lands are found as such there is often no clearcut separation between slum areas and other better residential areas of the city. The pattern of outlying slums appear to resemble more closely the ecological configuration of Latin American cities than of cities in the United States.

On the other hand, Businessmen areas are those areas where most of the businessmen live and mainly who are engaged in business activities. Doctors and Lawyers are also included in this group. Most of the businessmen

live in Dhanmondi Residential Area, Elephant Road area, Science laboratory area, Kathal bagan, Kawran bazar area, Farmgate area, Rajabazar, Tejgaon, Malibag, Magbazar, Gulshan and Banani Model Town area, Fulbaria, Purana Paltan area, Baitul Mukkaram, Stadium area, Kallyanpur, Paikpara, Shenpara Parbata etc. (see Map 18) of New Dhaka city.

In old Dhaka city, Businessmen Residential areas are found in Chawk bazar, Bakshi bazar, Hosni Dalan area, Islampur, Bangla bazar, Patuatoli, Naya bazar and Sadarghat areas. In these areas retail, wholesale and residential quarters are intermixed.

In most of the cases ground floors of the houses in these areas are used as shops and workshops and upper units are used for residential purposes. Chawk bazar, Moulvi bazar, Islampur, Patuatoli, Nawabpur are important business centres of Dhaka city.

In old Dhaka city, 'traffic jam' is one of the main problems as the roads, lanes and bylanes are narrow. Most of the shops are composed of doctor's chambers, lawyer's chambers, retail shops, offices, banks, hotels, restaurants, cinema halls etc.

The last factor is the Cottage industry area of the city mainly found in Mirpur, Mohammadpur, Rayer bazar, Zigatola, Monipuripara, Tejkunipara, Rajabazar, Kawran bazar, Begunbari and other areas of the city (see Map 19). Rent free dwellings and divorced males are also

found in these areas. The wage rate of both males and females who engaged in these cottage industries are low.

On the whole, the urban pattern of Dhaka city is the resultant intermixture of different land use patterns (zonal, sectoral and nuclei pattern) of social status, family life cycle or family status and religious status.

The above mentioned factors were also the main measurements of Shevky-Bell hypothesis (1955). The spatial patterns of Dhaka city formed by these factors mainly differ from Western and traditional ecological patterns of urban land use theory. Rest of the factors (Land use gradient, Slum versus Businessmen area and cottage industry area) focussed the special features of land use pattern or areal configuration of the population of Dhaka city in 1981.

Despite the results of factor analysis and their interpretation, Dhaka is a modernizing city. According to Abu-Lughod and Mc-Elarth, social status and family status become separated in a modernized city and in a pre-industrial city these two factors are highly correlated. In this study, social status and family status are two distinctly separate factors as such it may be argued that Dhaka is a modernizing city. But in some respect the pattern of residential and commercial differentiation resemble those of both modern and pre-modern cities.

This ecological study focuses on the varying

degree of residential differentiation which suggest an underlying process of social differentiation and an emerging system of stratification. The spatial distribution of different factors revealed a complex mosaic of overlapping subareas.

Over time the spatial distribution of various spatial organizations in Dhaka city has changed in response to politico-socio-economic changes and different activities in the city that led to the gradual development of various new functional zones such as new residential cum commercial and industrial areas in the city.

The influence of contemporary architecture and urban design no doubt alter the physical appearance of the city, as time goes on, but the social impact of those influences may be minimal.

Most of the buildings in new residential model towns, new modern shopping centres new roads and highways construction of which have been made in recent years represent changes in standard of living rather than patterns of living. The structures incorporate modern styles and convenience features without altering the basic pattern of social, economic or spatial organization.

The development of Dhaka city also occurred along the main highways and on the available higher grounds. This is partially visible in the development of high

class areas of Gulshan, Banani, Baridhara and Uttara model towns. Further when dissatisfied with their existing housing areas, they moved outwards to new housing areas in order to maintain their standard of living. In the wake of this continued outward movement of high status households, the housing they vacate, will then be occupied by middle status households whose own housing will in turn be occupied by lower status household.

The pre-eminence of Dhaka city is based on its being the capital of Bangladesh. It is the administrative seat of the government. Other service facilities such as educational, medical,retail, wholesale and industrial areas grow as ancillary activities.

Dhaka city is surrounded by land having different height from the sea level. In some areas, the reccurence of flood is normal. The city could expand only in areas where higher grounds were available as in Dhanmondi, Gulshan, Banani, Baridhara, Uttara, Tejgaon and Tongi. As such no true 'suburban ring' was apparent in 1981 (see Map 7). The newly annexed and developed areas are mostly high class residential areas or industrial estates.

From the findings of the present research it may be concluded that Dhaka in 1981 could be described as a complex mosaic of small differentiated subareas. The lack of sharp distinctions among different subareas indicates that the city of Dhaka has a complex mosaic of

spatial structures consistent with a transitional city characteristics, as clearly defined areas of low status people existed in 1981 although clusters of sectors having high status residential areas in the urban periphery showed the impact of western style urban system. This trend could be noted in the Gulshan and Banani Model towns situated in ward No. 51. This ward is a big ward comprising also of areas inhabited by low status people. In an ecological study the average condition of a ward is generally considered to be the representative feature of the ward (Nizamuddin 1981). However, as the population consists of a larger number of low status people in comparison to the number of high status people residing in this ward although the area occupied by high status is larger, the highest score in this ward had changed into middle status areas (see Map 14).

The spatial pattern of Dhaka city is markedly different from typical western cities, because like cities in other third world countries overcrowding is one of the main characteristics of Dhaka city. Third world urbanization involves larger number of people than the western world. Rapid urbanization is taking place in Dhaka city even though level of economic development is very low. The population of the city is growing very fast mostly due to migration from rural areas than due to high birth rate within the city. The migrants

perception of employment opportunities have been one of the main factors which have pulled the poor to the city of Dhaka. Most of the rural migrants find at best marginal employment in the city and live in different areas of the city in squatters and bustees. This creates an unprecedented pressure on public utility services.As a result, pressure for rapid social change are greater than they are in the western cities. It should be remembered that urbanization in the developing countries were caused by demographic and economic necessity, as opposed to initial urbanization process in developed countries characterized by technological or economic necessities (Santos, 1980). As such the ecological structure of this transitional city could be associated with increasing level of social stratification and inequality.

The tremendous increase in population in recent years coupled with the government policy of providing public utility services preferably to only high class residential areas, the urban environment of the city is deteriorating fast specially in lower class areas[15]. In this city, about 70% of the low income people live in bustees, refugee colonies and resettlement camps of different areas of the city, whereas high status people live in large fashionable buildings of old and new Dhaka city. Most of the development work have been done for

[15] Nizamuddin, K. and Khuda, Zinat R.M.M."Residential problems and Maldistribution of Resources in Dhaka city", Oriental Geographer, 1988. Vol. 32.

the benefit of upper status people. And the lower status people has remained associated with the lower side of the social status dimension of the city with little indication of change. This kind of discrimination, is one of the prime causes of disorder, unrest and violence in the society.

For the development of society, it is essential to provide the low status people more equitable economic, educational, employment and other oportunities so that lower status people can have a better living condition. Policy should be made to give high priority to promoting better social facilities for the poor people of the city. Attention should be given to extend educational and employment opportunities to the poor women specially in the periphery areas and to encourage female participation in various activities. They should be trained and absorbed in household or cottage industries and various other secondary and tertiary activities. Housing problem of the homeless people and bustee people should be solved and they should be rehabilitated in better areas with public utility services. Outright demolition of bustees without providing them affordable accommodation will not solve the problem and eventually bustees will grow again. Construction of multistoried appartment houses should be undertaken by the government for lower class and also middle class people of the city. National level planning is needed to improve the whole anamolous conditions of

Dhaka city.

Although Dhaka city is historically an old city, it is a city belonging to a least developed country. As such it has certain characteristics well marked in underdeveloped countries. The functional zones are not exclusive. Rich and poor residential areas often coexist in a single area. Often retail shops coexist with residential areas. This is specially true in areas of the old city. Strict adherence to zoning rules may change this picture in the future.

The outward expansion of the city boundary and the introduction of secondary nodes of work place (Savar, Narayanganj) and a heavy-industrial area (Tongi industrial area) further changes the form of the model of the metropolitan city of Dhaka (see Map 7).

As a whole, the present study is a partial inquiry of social environment of Dhaka city in 1981. To study the future ecological state of Dhaka city, the same factor analysis procedure may be repeated for the 1991 census data with 75 wards of Dhaka Municipal Corporation for comparative study of Dhaka's changing ecological pattern.

In conclusion, it is necessary to say that any attempt in planning the city in the future must be undertaken against the background of broad review of existing economic, technological, demographic, cultural and political trends. Dhaka is a 'modernizing city' and

this up to date ecological study will be helpful for physical and social town planners to take steps for better development of Dhaka city in the near future and also to remove the various anamolies existing in Dhaka city.

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APPENDIX-I

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* INCLUDE - TO BRING IN COMMAND FILES             * IMPROVEMENTS IN:
* RENAME VARS - TO RENAME VARIABLES               *   MANOVA
* AUTORECODE - TO RECODE STRINGS AS NUMBERS       *   TABLES
* RELINKING USERCODE                              *

TITLE "SOCIAL AREA ANALYSIS OF DHAKA CITY"
FILE HANDLE MASFERA/ NAME = "MASFERA DATA A1"
FILE HANDLE FACOUT/  NAME = "FACOUT OUTPUT A1"
DATA LIST FIXED FILE = MASFERA RECORDS = 12 NOTABLE
  /1 THANA 1-2 WARD 3-4 TOPOP 5-10 TOML 11-15 TOFL 16-20 TOMUS 21-25
   TOHIN 27-31 TOBUD 32-36 TOCHR 37-41 TOOTH 42-46
  /2 OCNOTW 5-7 OCHHD 10-14 OCCULT 15-19 DAGNC 20-24 DMANU 25-29
   OBUSI 30-34 OOTHHW 35-39 TOHHD 40-44
  /3 TODWE 5-9 TOINS 10-14 TOBIN 15-19 TOKH 20-24 TOSPH 25-29
   TOPAH 30-34 HHHPW 35-39 HHHAL 40-44
  /4 HHHOH 5-9 HHHCI 10-14 HHAOL 15-19 TRIHH 20-24 TOOOU 25-29
   TOROU 30-34 TOROU 35-39 DUW1P 40-44
  /5 DUW2P 5-9 DUW3P 10-14 DUW4P 15-19 DUW5P 20-24 DUW6P 25-29
   DUW7P 30-34 DUW8P 35-39 DUW9P 40-44
  /6 DUW10P 5-9 AVSHH 10-14 NWML 15-19 NWFL 20-24 MRML 25-29
   MRFL 30-34 WDML 35-39 WDFL 40-44
  /7 DIVML 5-9 DIVFL 10-14 LITML 15-19 LITFL 20-24 ILITML 25-29
   ILITFL 30-34 NOSCML 35-39 NOSCFL 40-44
  /8 PRIML 5-9 PRIFL 10-14 SECML 15-19 SECFL 20-24 SSHSML 25-29
   SSHSFL 30-34 DEGML 35-39 DEGFL 40-44
  /9 ATEDML 5-9 ATEDFL 10-14 RSBWS3 15-19 RSBWMB 20-24 RSBWCW 25-29
   RSBWCM 30-34 RTWS3 35-39 RTWMB 40-44
  /10 RTWCW 5-9 RTWCM 10-14 RCWS3 15-19 RCWMB 20-24 RCWCW 25-29
   RCWCM 30-34 RCMWS3 35-39 RCMWMB 40-44
  /11 RCMWCW 5-9 RCMWCM 10-14 FLOPOP 15-19 TOASK 20-24
  /12 OBD1 1-5 OBD2 6-10 OBD3 11-15 OBD4 16-20 OBD5 21-25
   SLUM 26-30(2)
COMPUTE TORESP = TOMUS + TOHIN +TOBUD +TOCHR + TOOTH
COMPUTE TOOCCUP = OCNOTW + OCHHD +OCCULT +DAGNC + DMANU +OBUSI + OOTHHW [illegible]
COMPUTE TOMRST = NWML +NWFL +MRML +MRFL + WDML +WDFL+ DIVML + DIVFL
COMPUTE T2TOBP=DUW2P+DUW3P+DUW4P
COMPUTE T5TO10P = DUW5P + DUW6P+DUW7P+DUW8P+DUW9P+DUW10P
COMPUTE PMUS = (TOMUS * 100 ) / TORESP
COMPUTE PHIN = (TOHIN * 100 ) / TORESP
COMPUTE POCNOTW = (OCNOTW * 100 ) / TOOCCUP
COMPUTE POCHHD = (OCHHD * 100 ) / TOOCCUP
COMPUTE POCULT = (OCCULT * 100 ) / TOOCCUP
COMPUTE PDAGNC = (DAGNC * 100 ) / TOOCCUP
COMPUTE PDMANU = (DMANU * 100 ) / TOOCCUP
COMPUTE POBUSI = (OBUSI * 100 ) / TOOCCUP
COMPUTE POOTHW = (OOTHHW * 100 ) / TOOCCUP
COMPUTE PTOINS = (TOINS * 100 ) / TOHHD
COMPUTE PTOBIN = (TOBIN * 100 ) / TOHHD
COMPUTE PTOKH = (TOKH * 100 ) / TODWE

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COMPUTE PTOSPH = (TOSPH * 100 ) / TODWE
COMPUTE PTOPAH = (TOPAH * 100 ) / TODWE
COMPUTE PHHHAL = (HHHAL * 100 ) / TOHHD
COMPUTE PHHHCI = (HHHCI * 100 ) / TOHHD
COMPUTE PTOOOU = (TOOOU * 100 ) / TODWE
COMPUTE POTOROU = (TOROU * 100 ) / TODWE
COMPUTE PTORFOU = (TORFOU * 100 ) / TODWE
COMPUTE PDUW1P = (DUW1P * 100 ) / TODWE
COMPUTE PT2TO4P= (T2TO4P * 100 ) / TODWE
COMPUTE PT5TO10P= (T5TO10P * 100 ) / TODWE
COMPUTE PDIVML= (DIVML * 100) / TOMRST
COMPUTE PDIVFL= (DIVFL * 100) / TOMRST
COMPUTE PLITML=(LITML* 100) / TOPOP
COMPUTE PLITFL=(LITFL* 100) / TOPOP
COMPUTE PSECML=(SECML* 100) / TOPOP
COMPUTE PSECFL=(SECFL* 100) / TOPOP
COMPUTE PDEGML=(DEGML* 100) / TOPOP
COMPUTE PDEGFL=(DEGFL* 100) / TOPOP
COMPUTE PFLOPOP=(FLOPOP * 100)/TOPOP
COMPUTE DNPSK=(TOPOP/TOASK)/248
FACTOR VARIABLES=PMUS TO DNPSK SLUM/
 PRINT=CORRELATION INITIAL EXTRACTION ROTATION FSCORE/
 EXTRACTION=PC/
 ROTATION=VARIMAX/
 SAVE REG (ALL FSUL9)

THERE ARE   371272 BYTES OF MEMORY AVAILABLE.
THE LARGEST CONTIGUOUS AREA HAS   371272 BYTES.

>NOTE    11284
>SINCE THE ANALYSIS SUBCOMMAND IS NOT USED, ALL VARIABLES ON THE
>SUBCOMMAND WILL BE USED FOR THE FIRST ANALYSIS.
                                                          VARIABLES
THIS FACTOR ANALYSIS REQUIRES      134796 1       131.6K) BYTES OF
                                                          MEMORY.
```

- FACTOR ANALYSIS -

ANALYSIS NUMBER 1 LISTWISE DELETION OF CASES WITH MISSING VALUES

CORRELATION MATRIX:

	PMJS	PHIN	PDENSITY	PDCHHD	PDCULT	PDACNC	PDMANU	PDBUSI	PDOTHW	PTDINS	PTDBIN	PTDRH
PMJS	1.00000											
PHIN	-.97835	1.00000										
PDENSITY	.20549	-.18427	1.00000									
PDCHHD	.24807	-.21058	.33559	1.00000								
PDCULT	.05475	-.06201	.21129	.00588	1.00000							
PDACNC	-.05425	-.04002	-.04482	.21546	.08233	1.00000						
PDMANU	.12897	-.11793	-.06373	-.04273	-.10722	.05975	1.00000					
PDBUSI	.27941	.25166	-.37917	-.39181	-.17888	-.25952	.09170	1.00000				
PDOTHW	-.07205	.05586	-.00098	-.50051	.02522	-.04740	-.53308	-.43805	1.00000			
PTDINS	-.19456	.20259	-.07554	-.66484	.04942	-.14158	-.01942	.01375	.53058	1.00000		
PTDBIN	-.35683	.31086	-.49357	-.61871	-.13521	-.20752	.15203	.50238	.07248	.14381	1.00000	
PTDRH	.00367	-.03247	-.00554	.17805	.23271	.17110	-.17492	-.25899	.09291	-.08032	-.29154	1.00000
PTDSPH	.38076	-.35944	-.01354	.38459	.08412	.18278	.25028	-.07872	-.39592	-.25546	-.31690	.41550
PTDPAH	-.42478	.42799	.02511	-.35483	-.18118	-.20536	-.12923	.15520	.25047	.22442	.34587	-.73733
PHHHAL	.13353	-.20438	.00534	.18159	.09971	-.03740	-.10372	-.18479	.03018	.04987	-.28173	-.07013
PHHHCB	.00587	-.09446	.11211	.01093	.00586	.01178	.05616	.03831	-.05895	-.19225	.15042	.27149
PTDDDJ	-.00884	.03291	-.08795	.01499	-.05745	-.04319	.35332	.38380	-.46865	-.24848	.26311	-.51572
PDTDRDJ	-.00945	.01456	.17594	.02424	.13633	.02115	-.16554	-.10386	.12293	.15240	-.24095	.16500
PTDREDJ	.05047	-.09540	.36571	-.14249	.23008	.02881	-.13675	-.30154	.36817	.10559	-.07145	.34259
PDUWIP	.01551	-.01999	-.15614	-.00528	.24592	.07325	-.14514	-.39535	.33590	.16593	-.16001	.35591
PT2TD4P	.25191	-.23207	-.10080	.27770	.25049	.31488	.09739	-.31538	-.08189	-.05339	-.35839	.59309
PT5TD1DP	-.23071	.21429	.11433	-.24720	-.27030	-.29270	-.05752	.35994	.00526	.01779	.35238	-.58187
PDIVML	.01957	-.07497	-.04643	-.26842	-.20357	-.15157	.05635	.11833	.13531	.10329	.27435	-.03935
PDIVFL	-.00454	-.03496	-.15957	-.11273	-.15178	-.11855	-.33798	.02444	.27610	.18042	-.10241	.01319
PLITML	-.23692	.18424	-.03545	-.73014	.13501	-.24246	-.25992	.04746	.69069	.72526	-.26137	-.13920
PLITFL	-.03852	-.00487	.27243	.18344	-.14467	-.15309	-.44940	-.17051	.25863	-.04862	-.28542	-.15546
PSECML	-.40158	.36419	-.21642	-.74532	.13352	-.04981	.00772	.21393	.41896	.51035	.47742	-.28554
PSECFL	-.12479	.09737	.27371	.36154	-.13707	-.05992	-.35599	-.21194	.07383	-.22467	-.32274	-.15708
PDEGML	.04558	-.07022	.28655	-.24798	-.02324	-.24673	-.43953	-.23194	.52915	.48009	-.19321	.01850
PDEGFL	.09017	-.12480	.22704	-.15799	-.10905	-.22885	-.44031	-.18066	.51411	.28893	-.17934	-.03914
PELDPD	-.39503	.33152	-.27939	-.56400	.20541	-.11829	-.11456	.31710	.25144	.42351	.45864	.05975
DNPSC	-.23011	.25554	-.13129	.01294	-.27354	-.25227	.17258	.37350	-.32839	-.09104	.15608	-.48697
SLDM	.12585	-.15373	.09567	.04800	-.02193	.07313	.07583	-.01752	-.06404	-.14552	.00869	.33543

	PTDSPH	PTDPAH	PHHHAL	PHHHCB	PTDDDJ	PDTDRDJ	PTDREDJ	PDUWIP	PT2TD4P	PT5TD1DP	PDIVML	PDIVFL
PTDSPH	1.00000											
PTDPAH	-.91748	1.00000										
PHHHAL	-.07703	.09547	1.00000									

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	PTOSPH	PTOPAH	PHHHL	PHHHCI	PTOOOJ	POTOROJ	PTORFOJ	POUWIP	PT2TO4P	PT5TO10P	POIVML	POIVFL
PHHHCI	.05844	-.15434	.13341	1.00000								
PTOOOJ	.02114	.19075	-.25553	-.05146	1.00000							
POTOROJ	.15074	-.15855	.24842	-.21914	-.55351	1.00000						
PTORFOJ	-.24035	.03798	-.07111	.40559	-.30425	-.32552	1.00000					
POUWIP	-.03095	-.12592	.14446	-.00205	-.28461	-.03752	.34174	1.00000				
PT2TO4P	.55030	-.78504	-.04156	.07134	-.22758	.07975	.10058	.53637	1.00000			
PT5TO10P	-.55741	.71553	.00536	-.05318	.25567	-.06057	-.15835	-.55885	-.98501	1.00000		
POIVML	-.14898	.11833	-.02549	.22290	-.07580	-.03502	.11182	-.23593	-.14314	.17301	1.00000	
POIVFL	-.13851	.10579	.35372	-.01407	-.25712	.15948	-.05840	-.08311	-.23456	.22524	.12024	1.00000
PLITML	-.52345	.45550	.15265	-.14535	-.36489	.25602	.13648	.05937	-.35946	.31252	.09256	.33646
PLITFL	-.39351	.37781	.50753	-.08770	-.33565	.22222	.01759	-.12012	-.41779	.38580	-.02012	.52916
PSECML	-.45345	.47274	.01154	-.15503	.03012	.08392	.11353	-.02444	-.35564	.33096	.04633	.05348
PSECFL	-.32339	.32472	.45507	-.13500	-.21942	.23580	-.12502	-.11815	-.34236	.32073	-.13625	.25438
PDEGML	-.33995	.25692	.23734	-.10996	-.54995	.33838	.14323	.05525	-.23815	.19352	.06380	.43957
PDEGFL	-.34555	.30952	.39753	-.02115	-.42151	.19956	.17594	-.01505	-.33575	.29551	.13552	.67575
PELDPOP	-.31871	.21797	-.12055	.05875	-.19591	.02057	.18905	.03828	-.25234	.22271	-.01105	.18184
DNPSK	-.05853	.24973	-.24951	-.22755	.43345	-.27545	-.28245	-.32293	-.30864	.33673	.02232	-.17082
SLUM	.12784	-.24123	-.23320	.23117	-.21089	.02445	.34054	.01501	.04740	-.04591	.02415	.01548

	PLITML	PLITFL	PSECML	PSECFL	PDEGML	PDEGFL	PELDPOP	DNPSK	SLUM
PLITML	1.00000								
PLITFL	.42751	1.00000							
PSECML	.53351	.04649	1.00000						
PSECFL	.19729	.85825	.01518	1.00000					
PDEGML	.75227	.67080	.02921	.40594	1.00000				
PDEGFL	.59750	.73432	.04189	.41150	.85513	1.00000			
PELDPOP	.47572	-.09797	.50492	-.18374	.13025	.05582	1.00000		
DNPSK	-.20295	-.20210	.01548	-.09995	-.28597	-.29240	-.05579	1.00000	
SLUM	-.14803	-.17125	-.18287	-.22793	-.08380	-.04235	.10129	-.17885	1.00000

>WARNING 11302
>THE CORRELATION MATRIX IS ILL-CONDITIONED.

EXTRACTION 1 FOR ANALYSIS 1, PRINCIPAL-COMPONENTS ANALYSIS (PC)

- - - - - - - - F A C T O R A N A L Y S I S - - - - - - - -

INITIAL STATISTICS:

VARIABLE	COMMUNALITY	*	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
PMUS	1.00000	*	1	7.11277	21.6	21.6
PMIN	1.00000	*	2	5.49555	16.7	38.2
POCNOTW	1.00000	*	3	3.93345	11.9	50.1
POCHHO	1.00000	*	4	2.23428	6.8	56.9
POCULT	1.00000	*	5	2.01859	6.1	63.0
POKCNC	1.00000	*	6	1.68652	5.1	68.1
POMANU	1.00000	*	7	1.43994	4.4	72.5
POBUSI	1.00000	*	8	1.29447	3.9	76.4
POOTHW	1.00000	*	9	1.10548	3.3	79.8
PTOINS	1.00000	*	10	1.03798	3.1	82.9
PFOBIN	1.00000	*	11	.85383	2.6	85.5
PTOK4	1.00000	*	12	.77190	2.3	87.8
PTOSP4	1.00000	*	13	.64143	1.9	89.8
PTOPAH	1.00000	*	14	.53953	1.6	91.4
PHHHAL	1.00000	*	15	.49234	1.5	92.9
PHHHCI	1.00000	*	16	.47511	1.4	94.4
PTOOOW	1.00000	*	17	.43509	1.3	95.7
POTOROJ	1.00000	*	18	.30578	.9	96.6
PTOREOJ	1.00000	*	19	.25773	.8	97.4
POJAMP	1.00000	*	20	.22599	.7	98.1
PTZTO4P	1.00000	*	21	.19932	.6	98.7
PTSTO10P	1.00000	*	22	.13901	.4	99.1
POIVML	1.00000	*	23	.08624	.3	99.4
POIVFL	1.00000	*	24	.07194	.2	99.6
PLITML	1.00000	*	25	.04885	.1	99.8
PLITFL	1.00000	*	26	.03825	.1	99.9
PSECML	1.00000	*	27	.02100	.1	99.9
PSECFL	1.00000	*	28	.01318	.0	100.0
PDEGML	1.00000	*	29	.00507	.0	100.0
PDEGFL	1.00000	*	30	.00217	.0	100.0
PFLOPOP	1.00000	*	31	.00145	.0	100.0
DNPSK	1.00000	*	32	.00004	.0	100.0
SLUM	1.00000	*	33	.00000	.0	100.0

PC EXTRACTED 10 FACTORS.

FACTOR MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	FACTOR 7	FACTOR 8
PMUS	-.44735	.35850	-.17235	.44749	-.28859	-.47701	-.02057	.11357
PMIN	.40997	-.37893	.14922	-.50465	.30385	.41402	.05729	-.18416

FACTOR ANALYSIS

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	FACTOR 7	FACTOR 8
*DCNDTW	-.04293	.35387	-.35348	.23456	.41004	-.21438	.56688	-.02502
*DCHHD	-.60533	.22834	-.53652	-.15551	.22216	.17497	-.01116	-.04077
*DCDLT	-.15551	.21743	.30839	-.17017	.24155	-.11783	.33881	.49990
*DACNC	-.33893	.09604	.08742	-.21289	.18038	.04530	-.01059	.14996
*DMANJ	-.33608	-.46708	.04441	.13214	-.13193	-.29307	.09759	.24828
*DBJSI	.20377	-.64381	.03518	.09011	-.35177	.30278	.03458	.11553
*DDTHW	.54021	.49544	.41873	.01684	.11195	-.19455	-.12701	-.26047
*TDINS	.50724	.12727	.53902	-.11719	-.21516	-.33095	.09795	-.08818
*TDBIN	.35942	-.61140	.38761	.19423	-.09180	.13132	-.13914	.09739
*TDCH	-.50151	.53242	.42854	.11191	-.05319	.30850	.03323	-.02671
*TDSPH	-.78084	.08165	.02237	-.05751	-.42355	.04458	.13671	-.02390
*TDPAH	.80335	-.27388	-.20493	-.01692	.34740	-.15227	-.10501	.02971
*HHHAL	.15345	.43766	-.29907	-.12585	-.14726	-.00349	-.32374	.57761
*HHHDI	-.15442	.04622	.13650	.55100	.21759	.39522	-.17919	.30171
*TDDDJ	-.14294	-.73427	-.25111	.04956	.09511	-.31086	-.13721	.14065
*DTDRDJ	.09942	.42175	-.02510	-.34758	-.41857	.15570	.50744	.06996
*TDREDJ	.03975	.83220	.35542	.47560	.61021	-.00218	-.00186	.00210
*DJWLP	-.17452	.39785	.47701	-.28624	.29553	-.12557	-.40609	-.02361
*PZTD4P	-.74736	.33019	.40248	-.24528	-.07277	-.01581	-.15353	-.07489
PSTDLD	.69435	-.37318	-.44290	.26910	.00316	.04439	.21549	.05960
*DIVHL	.13354	-.08339	.07632	.50590	-.19801	.03319	-.14512	-.14857
*DIWFL	.42051	.36550	-.14372	.10536	-.39338	.27516	-.26994	.02932
*LITHL	.82765	.27479	.33498	-.03677	-.15645	-.15358	.09718	.04953
*LITFL	.55171	.52945	-.54921	-.02821	.02413	.13848	-.09276	.08111
*SECHL	.63908	-.21350	.42452	-.17065	.02440	-.15391	.11414	.29477
*SECFL	.36438	.38030	-.54174	-.25022	.16375	.18509	-.03486	.11760
*DEGHL	.60879	.65383	-.03902	.06690	-.13730	-.10452	.10222	-.20096
*DEGFL	.60430	.60395	-.20955	.21872	-.15269	-.01490	-.10462	-.06712
*FLDP3P	.45703	-.13700	.55961	.01448	-.02412	.30854	.16208	.19964
DWPSC	.05139	-.63982	-.27535	-.09765	-.02013	-.10469	.00577	-.33756
SLOM	-.21536	.08785	.18750	.47518	.08254	.37222	.30189	-.13783

	FACTOR 9	FACTOR 10
*HDS	-.12075	-.21753
*HIN	.11154	.19382
*DCNDTW	.01784	.24316
*DCHHD	-.02355	.00826
*DCDLT	-.34479	.07981
*DACNC	.51786	-.53111
*DMANJ	.34558	.11519
*DBJSI	-.27033	.06828
*DDTHW	.03476	-.12232
*TDINS	.05041	.15613
*TDBIN	.05791	-.03535
*TDCH	-.11775	-.01280
*TDSPH	-.03279	.06983

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	FACTOR 9	FACTOR 10
PTOPAH	.07347	-.04225
PHHHAL	.03083	.21940
PHHHCI	.11752	.31865
PTOOOO	-.10084	-.08945
POTOROO	.24015	.11214
PTOREOO	-.05447	.05251
POOWIP	-.14175	.05225
PT2TO4P	.02848	.14478
PT5TO10P	.00243	-.13740
POIVML	.42732	.35255
POIVFL	-.11910	-.19065
PLITML	.00441	.01401
PLITFL	-.02557	-.02090
PSECML	.12453	-.10322
PSECFL	.05108	-.00467
PDEGML	-.09220	.07413
PDEGFL	-.03542	-.01113
PELDPOP	-.23135	-.12340
ONPSK	-.19525	.15375
SLUM	.02354	-.32559

FINAL STATISTICS:

VARIABLE	COMMUNALITY	*	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
PMJS	.94475	*	1	7.11277	21.6	21.6
PMIN	.93341	*	2	5.49555	16.7	38.2
POCNOTW	.90973	*	3	3.93845	11.9	50.1
POCHHO	.93151	*	4	2.23428	6.8	56.9
POCOLT	.75758	*	5	2.01869	6.1	63.0
POACNC	.78451	*	6	1.68852	5.1	68.1
POMANO	.55771	*	7	1.43594	4.4	72.5
POBOSI	.78023	*	8	1.29447	3.9	76.4
POOTHW	.85942	*	9	1.10548	3.3	79.8
PROINS	.77398	*	10	1.03798	3.1	82.9
PTOBIN	.75737	*				
PTOKHO	.84532	*				
PTOSP4	.82688	*				
PTOPAH	.92564	*				
PHHHAL	.83363	*				
PHHHCI	.79029	*				
PTOOOO	.81400	*				
POTOROO	.84455	*				
PTOREOO	.85477	*				
POOWIP	.78993	*				

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VARIABLE	COMMUNALITY	*	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
PTOTO4P	.94629	*				
PTSTOIOP	.95211	*				
POIVML	.59274	*				
POIVFL	.59318	*				
PLITML	.93408	*				
PLITFL	.92317	*				
PSECML	.81374	*				
PSECFL	.83170	*				
PDEGML	.89376	*				
PDEGFL	.87415	*				
PFLOPOP	.77157	*				
DNPSK	.58917	*				
SLUM	.57715	*				

VARIMAX ROTATION 1 FOR EXTRACTION 1 IN ANALYSIS 1 - KAISER NORMALIZATION.

VARIMAX CONVERGED IN 13 ITERATIONS.

ROTATED FACTOR MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 5	FACTOR 7	FACTOR 8
PMOS	.00562	-.14757	-.15335	-.93743	.13234	-.02819	-.02391	-.02658
PHIN	-.04409	.13815	.13254	.94058	-.08456	-.08245	.01466	.01064
POCCOTW	.09473	.18745	-.15505	-.13564	.85050	.12444	.14512	-.09561
POCHHO	.07599	-.15828	-.38549	-.04695	.27797	-.07519	.05577	.09440
POCOLT	-.12773	-.21780	.15310	-.05867	.20235	.13560	.07705	.05120
PAGRI	-.15756	-.15247	-.13146	-.00214	.00585	-.05291	.04617	-.07863
POMANU	-.71535	.12497	-.00373	-.21703	-.02184	.10736	.13229	.15574
POBUSI	-.22513	.35780	.02959	.15151	-.61079	.05208	.12020	-.10472
POOTHW	.49547	-.17594	.57394	.04791	.19851	-.06250	-.21723	-.08480
PTOINS	.07095	-.10411	.83942	.05188	.04727	.12879	.10376	.08305
PTOBIN	-.29524	.31562	.41745	.22154	-.49114	.20933	-.15543	-.11597
PTOKH	.13233	-.73562	-.08359	-.16536	-.00698	.27576	.14443	-.34995
PTOSPH	-.31745	-.51288	-.39139	-.34153	-.10585	-.08498	.40057	-.09489
PTOPKH	.19575	.59530	.32429	.33855	.09033	-.05491	-.34741	.22025
PHHHAL	.41144	-.00516	-.06333	-.16987	-.05347	.28379	.15240	.70374
PROHCI	-.04743	-.07853	-.13539	-.00381	-.02010	.95255	-.10041	-.06404
PTOOOO	.55417	.42429	-.22758	-.10639	-.19824	-.18841	-.37248	.15813
POTOROO	.25059	-.12087	.13216	.06312	.12934	-.12122	.83577	.04936
PTOROOO	.11883	-.17329	.23528	-.01711	.42311	.51551	-.44067	-.31522
POOWIP	.11314	-.69530	.18799	.10254	.07718	-.00248	.39629	.17158
PTOTO4P	-.22357	-.91703	-.14947	-.10672	.03555	-.00585	.07381	.02867

24 MAY 89 SOCIAL AREA ANALYSIS OF DHAKA CITY
20:25:09 COMPUTER CENTRE, BUET

- F A C T O R A N A L Y S I S -

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	FACTOR 7	FACTOR 8
PTSTOTOP	.17733	.74317	.09775	.07934	-.05235	.00518	.01515	-.06110
PDIVML	-.05140	.10942	.22347	-.06884	.01559	.43311	.07243	.00066
PDIVFL	.70515	.08398	.08150	-.14638	-.37523	.05257	.09838	.03258
PLITML	.44618	.17459	.82190	.07855	.00990	-.02208	.10351	.08002
PLITFL	.83742	.32258	-.08595	.01344	.15229	.02857	.08302	.27151
PSECML	-.05628	.31295	.73908	.24330	-.14856	-.00418	.00930	.12230
PSECFL	.53273	.31094	-.29456	.19291	.21355	-.05046	.12310	.34340
PDEGML	.75849	.03137	.42036	-.09728	.28513	-.07502	.13753	.01337
PDEGFL	.83103	.15165	.25577	-.20193	.12544	.05809	.02770	.08411
PFLOPOP	.07947	.09835	.53325	.28085	-.35509	.19428	.03123	-.29150
DNPSC	-.31546	.33752	-.18129	.22755	-.03714	-.35676	-.15555	.01474
BLDM	.01494	-.03257	-.10530	-.12393	.00730	.28215	.06431	-.73583

	FACTOR 9	FACTOR 10
PMJS	-.00395	.03002
PHIN	-.00036	-.02918
PCINDTW	.16003	-.10540
PCHHD	.05039	.11843
PCOJLT	.77279	-.02322
POANDC	.02453	.83845
POMANU	-.14544	.09127
PDBUSI	.03548	-.40847
PDOTHW	-.12157	.15051
PTOINS	-.05738	-.12652
PTOBIN	-.12127	-.07831
PTOCH	.15534	.05743
PTOSPH	-.00852	-.07258
PTOPAH	-.05511	.02504
PHHAL	.13293	.11715
PHHCI	-.05437	-.04183
PTOOOJ	.06573	-.14442
POTOROJ	.05987	.09152
PTORFOJ	.14742	.05135
POJWLP	.19053	.13287
PZTO4P	.03451	.10280
PTSTOTOP	-.05791	-.11794
PDIVML	-.54145	-.13747
PDIVFL	-.10345	-.00775
PLITML	.05043	-.05067
PLITFL	.00423	.04743
PSECML	.20703	.15116
PSECFL	.07212	.15562
PDEGML	-.05993	-.15757
PDEGFL	-.11993	-.09279
PFLOPOP	.35133	-.06975
DNPSC	-.19934	-.43749

- FACTOR ANALYSIS -

	FACTOR 9	FACTOR 10
SLUM	.01569	.15462

FACTOR TRANSFORMATION MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	FACTOR 7	FACTOR 8
FACTOR 1	.48873	.54828	.59018	.28554	-.05121	-.01490	-.04890	.11323
FACTOR 2	.59946	-.46007	.05479	-.26463	.37894	.10440	.15520	.04964
FACTOR 3	-.26129	-.51424	.53760	.13060	-.18583	.13070	-.09148	-.28393
FACTOR 4	.00813	.26043	.03132	-.51867	.07129	.58732	-.20651	-.40919
FACTOR 5	-.05395	.07549	-.13451	.41158	.54397	.20408	-.57773	-.08051
FACTOR 6	.28996	-.05835	-.35329	.51505	-.39515	.41193	.25743	-.34868
FACTOR 7	-.19337	.25275	.09941	.02304	.43781	-.11420	.60715	-.44044
FACTOR 8	-.12992	.19855	.03882	-.21420	-.20573	.46257	.15716	.45995
FACTOR 9	-.20184	.06931	.11338	.13043	.19176	.19402	.29887	.14624
FACTOR 10	-.14279	-.19525	.02428	.25335	.30223	.36770	.19129	.42622

	FACTOR 9	FACTOR 10
FACTOR 1	-.05218	-.09952
FACTOR 2	.10358	.17530
FACTOR 3	.13463	.05500
FACTOR 4	-.25584	-.17700
FACTOR 5	.27337	.22334
FACTOR 6	.02356	.03181
FACTOR 7	.33703	-.08589
FACTOR 8	.58487	.24838
FACTOR 9	-.57922	.53553
FACTOR 10	-.17593	-.63294

FACTOR SCORE COEFFICIENT MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	FACTOR 7	FACTOR 8
POPDS	-.00155	.05301	.04913	-.43585	-.02430	-.08428	-.08133	-.02198
POPDN	-.00509	-.05500	-.04586	.43534	.05427	.01480	.07234	-.00278
POPDTA	.09250	.11352	.00540	.00740	.46051	.07590	.13332	-.05698
POPHO	.05086	-.00987	-.21805	.08420	.05546	-.01418	-.01119	.01095
POPULT	-.07570	.02222	.05489	-.05220	.07582	.08908	.05410	.08431
POPDNC	-.05058	.08855	.00779	-.00881	-.05573	-.05293	.03402	-.08145
POPDNO	-.24818	.08339	.10130	-.10724	.08915	.12615	.15400	.18027

- FACTOR ANALYSIS -

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	FACTOR 7	FACTOR 8
*DDJSI	.01730	.04539	-.04350	.00431	-.24794	.06530	.08794	-.04703
*DDT4W	.03001	-.07553	.14680	-.00755	.05857	-.11576	-.14554	-.07716
*TDINS	-.07203	-.07408	.23541	-.02424	.09525	-.08057	.08542	.07953
*TDBIN	-.04876	.04454	.07121	.01328	-.17044	.12273	-.03926	-.01533
*TDK4	.03181	-.14250	-.03305	.01175	-.07547	.09135	.04090	-.15633
*TDSP4	-.04343	-.08892	-.03528	-.07462	-.05626	-.04322	.19943	-.02108
*TDPA4	.00021	.12652	.03775	.05867	.07754	-.00594	-.15870	.08085
*4HHAL	.03094	-.00951	-.01710	-.06374	-.11212	.25920	.05824	.46300
*4HHCI	-.02224	-.01257	-.06424	.07213	-.00776	.52639	-.00205	.10523
*DDDDJ	-.09145	.10564	-.02859	-.13535	-.05066	-.08238	-.20365	.09052
*DTDRDJ	-.03172	.00774	.05961	.08100	.08437	-.01997	.49785	.00084
*TDREDJ	.00423	-.01005	.03595	.01776	.18950	.22002	-.22375	-.11947
*DDW1P	.05041	-.22055	.03428	.07114	-.02271	-.02909	-.27818	.15177
*T2TD4P	-.03448	-.23243	.01003	.05304	-.00205	-.00793	.00716	.09597
*T5TD1P	.02054	.24705	-.01543	-.05843	.00407	.01257	.04994	-.11525
*DIW4L	-.03137	-.02502	.07346	.02496	.10051	.28090	.11070	.09794
*DIWEL	.22568	-.00603	-.05277	-.09564	-.30123	-.00159	-.02114	-.04139
*LITWL	.02728	.01453	.18185	-.04187	.01636	-.02340	.07029	.03045
*LITEL	.17555	.05121	-.08375	.00915	-.02003	.03599	.00165	.07395
*SEDWL	-.09275	.09061	.18124	-.00984	-.02274	.01571	.05321	.08367
*SEDEL	.12411	.06725	-.12502	.10909	.02550	.02587	.04357	.11514
*DESWL	.12734	-.02905	.07510	-.04172	.10081	-.08235	.04097	-.05114
*DESEL	.17391	.01130	.01782	-.10183	-.02234	.00448	-.03718	-.00838
EL_DDD	.04811	.03143	.05017	.04158	-.17598	.07302	.03959	-.15970
DNPSC	-.03025	-.00325	-.05286	.08350	.05346	-.17573	-.07589	-.02506
SLDM	.05081	.09172	-.05174	-.03551	-.02806	.05050	.04598	-.45531

	FACTOR 9	FACTOR 10
*DDS	.05198	.02513
*4IR	-.05885	-.02518
*DINDTW	.09029	-.14654
*DIHD	.02794	.02129
*DDDLT	.53930	-.11972
*DAINS	-.05785	.59773
*DMANJ	-.10820	.12991
*DBJSI	.12243	-.24154
*DDT4W	-.14086	.10258
*TDINS	-.07790	-.09939
*TDBIN	-.04756	.03945
*TDK4	.07041	-.04685
*TDSP4	-.01539	-.10183
*TDPA4	.01359	.09402
*4HHAL	.09736	.04387
*4HHCI	-.04537	-.05471
*TDDDJ	.12806	-.04428
*DTDRDJ	-.00124	.04884

- F A C T O R   A N A L Y S I S -

	FACTOR 9	FACTOR 10
PTORFOO	.05525	-.01729
POOMLP	.05705	-.01852
PT2TO4P	-.05484	-.03928
PT5TO10P	.04579	.03755
PDIVML	-.47193	-.05471
PDIVFL	-.01805	.02659
PLITML	.03202	-.01764
PLITFL	.02757	.02804
PSECML	.13945	.18784
PSECFL	.05087	.10203
PDEGML	-.05271	-.15342
PDEGFL	-.05519	-.07538
PFLOPOP	.23292	-.02999
OWPSK	-.09074	-.29949
SLOM	.02100	.15474

COVARIANCE MATRIX FOR ESTIMATED REGRESSION FACTOR SCORES:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	FACTOR 7	FACTOR 8	FACTOR 9
FACTOR 1	1.00000								
FACTOR 2	.00000	1.00000							
FACTOR 3	.00000	.00000	1.00000						
FACTOR 4	.00000	.00000	.00000	1.00000					
FACTOR 5	.00000	.00000	.00000	.00000	1.00000				
FACTOR 6	.00000	.00000	.00000	.00000	.00000	1.00000			
FACTOR 7	.00000	.00000	.00000	.00000	.00000	.00000	1.00000		
FACTOR 8	.00000	.00000	.00000	.00000	.00000	.00000	.00000	1.00000	
FACTOR 9	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	1.00000
FACTOR 10	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

	FACTOR 10
FACTOR 10	1.00000

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- - - - - - - - - - - - - - - - - - - - - - - - -   F A C T O R   A N A L Y S I S   - - - - - - - - - - - - - - - - - - - - - - - - -

 10 PC  EXACT  FACTOR SCORES WILL BE SAVED WITH ROOTNAME: FSULS

FOLLOWING FACTOR SCORES WILL BE ADDED TO THE ACTIVE FILE:

  NAME        LABEL

FSULS1        REGR FACTOR SCORE   1 FOR ANALYSIS    1
FSULS2        REGR FACTOR SCORE   2 FOR ANALYSIS    1
FSULS3        REGR FACTOR SCORE   3 FOR ANALYSIS    1
FSULS4        REGR FACTOR SCORE   4 FOR ANALYSIS    1
FSULS5        REGR FACTOR SCORE   5 FOR ANALYSIS    1
FSULS6        REGR FACTOR SCORE   6 FOR ANALYSIS    1
FSULS7        REGR FACTOR SCORE   7 FOR ANALYSIS    1
FSULS8        REGR FACTOR SCORE   8 FOR ANALYSIS    1
FSULS9        REGR FACTOR SCORE   9 FOR ANALYSIS    1
FSULS10       REGR FACTOR SCORE  10 FOR ANALYSIS    1
```

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24 MAY 89    SPSS-X RELEASE 2.2  FOR IBM VM/CMS
20:37:44     COMPUTER CENTRE, BUET

FOR                    COMPUTER CENTRE, BUET          LICENSE NUMBER 515110

USE INFO OVERVIEW FOR MORE INFORMATION ON:

* INCLUDE - TO BRING IN COMMAND FILES              * IMPROVEMENTS IN:
* RENAME VARS - TO RENAME VARIABLES                *    MANOVA
* AUTORECODE - TO RECODE STRINGS AS NUMBERS        *    TABLES
* RELINKING USERCODE                               *

   1  0          TITLE FACTOR SCORE
   2  0          FILE HANDLE FACOUT / NAME = 'FACOUT OUTPUT A1'
   3  0          GET FILE FACOUT

FILE CALLED FACOUT  :
  LABEL:
  CREATED 24 MAY 89 20:25:28      139 VARIABLES

   4  0          LIST VARIABLES = WARD PMUS TO ONPSK SLUM FSULS1 TO FSULS8

THERE ARE   370128 BYTES OF MEMORY AVAILABLE.
THE LARGEST CONTIGUOUS AREA HAS   370128 BYTES.

     1358 BYTES OF MEMORY REQUIRED FOR LIST PROCEDURE.
      472 BYTES HAVE ALREADY BEEN ACQUIRED.
     1386 BYTES REMAIN TO BE ACQUIRED.


THE VARIABLES ARE LISTED IN THE FOLLOWING ORDER:

LINE   1: WARD PMUS PHIN POCNOTW POCHHO POCULT POACNC POMANU POBUSI POOTHW PTOINS PTOBIN PTOCH PTOSPH

LINE   2: PTOPAH PHHAL PHHHCI PTOOOJ POTOROJ PTOREDJ POUWIP PT2TO4P PT5TO10P POIVML POIVFL PLITML PLITFL

LINE   3: PSECML PSECFL POEGML POEGFL PFLOPOP ONPSK SLUM FSULS1 FSULS2 FSULS3 FSULS4 FSULS5

LINE   4: FSULS6 FSULS7 FSULS8
```

WARD:	1	96.53	3.08	.39	31.66	1.20	.15	.79	13.66	55.15	1.91	3.44	34.19	13.83
PTOPAR:		46.07	15.72	.32	11.08	48.93	39.99	6.70	38.11	55.19	.01	.32	33.88	16.25
PSECML:		9.13	5.65	5.15	.99	2.82	53.80	48.12	1.20548	-1.75892	.05135	.31967	.51852	
FSJ_SS:		.04445	-2.25351	-1.95052										
WARD:	2	99.27	.47	.69	35.51	.54	.07	7.89	12.89	42.41	1.77	2.35	23.57	41.78
PTOPAR:		34.66	11.72	7.89	18.03	37.09	44.88	3.09	32.67	64.24	.04	.29	21.36	12.00
PSECML:		5.61	3.65	3.49	.91	1.44	83.29	41.40	-.47055	-.50797	-.92301	-.27705	2.02815	
FSJ_SS:		3.51157	-1.06781	-1.93712										
WARD:	3	96.79	2.55	.53	38.50	1.49	.44	6.04	15.11	36.89	2.25	3.48	10.47	13.53
PTOPAR:		75.00	26.13	.61	25.35	61.10	12.54	3.15	25.66	71.11	.02	.41	32.97	21.51
PSECML:		8.07	7.14	6.74	1.75	1.92	137.21	17.87	.75663	1.33819	-.72358	-.27927	.55367	
FSJ_SS:		-.13057	-.19479	-.05457										
WARD:	4	97.80	1.45	.43	34.07	.38	.08	4.93	14.70	45.42	3.24	4.30	21.57	21.03
PTOPAR:		57.40	28.93	1.20	20.12	59.77	10.11	4.14	31.58	64.28	.02	.56	33.71	17.72
PSECML:		8.15	5.80	7.53	1.99	1.89	74.19	8.89	1.16559	-.41524	-.20057	-.38418	-.20544	
FSJ_SS:		-.09353	-.15483	.37342										
WARD:	5	89.25	10.13	.41	35.80	6.60	.20	6.19	15.37	35.43	1.19	4.06	22.04	36.76
PTOPAR:		41.03	28.85	1.90	25.46	70.25	4.29	4.25	36.08	59.67	.01	.40	27.65	13.91
PSECML:		7.31	4.55	4.03	.93	4.27	52.84	13.53	-.25504	-.86137	-.55397	.29683	-.22350	
FSJ_SS:		.70613	.77190	.60018										
WARD:	6	93.57	6.02	.48	36.69	.44	.03	3.70	14.71	43.96	.83	4.78	19.06	15.18
PTOPAR:		64.76	37.82	2.02	19.01	70.11	10.88	4.00	31.99	64.02	.01	.33	32.00	21.03
PSECML:		8.17	8.05	7.12	1.69	.72	23.78	18.28	1.30744	-.36525	-.85868	.46951	.36035	
FSJ_SS:		.61620	-.04404	.59464										
WARD:	7	97.48	1.62	.41	29.93	.41	.06	1.55	11.48	56.15	9.60	2.53	6.19	13.56
PTOPAR:		80.25	43.62	1.81	31.54	61.28	7.18	2.88	21.91	75.21	.01	1.01	42.25	24.10
PSECML:		9.35	6.85	11.29	4.02	1.79	70.47	1.25	2.75553	1.35500	.38634	-1.33942	-.82355	
FSJ_SS:		-.17611	-.71520	1.39843										
WARD:	8	97.57	1.51	.29	24.55	.38	.07	4.28	40.79	29.64	5.59	2.82	14.73	41.97
PTOPAR:		43.31	40.75	.89	23.86	74.27	1.86	2.58	33.00	64.42	.01	.59	35.63	18.89
PSECML:		3.53	5.91	5.59	1.62	1.23	230.51	4.73	.72936	-.06521	-.41718	-.67685	-2.15213	
FSJ_SS:		-.05271	1.47673	.98922										
WARD:	9	98.17	1.42	.33	25.67	.26	.03	3.40	21.99	48.27	8.35	7.83	16.71	25.89
PTOPAR:		57.40	25.85	1.01	23.02	70.37	5.61	2.00	26.00	72.00	.02	.72	41.60	18.08
PSECML:		9.25	4.83	8.56	2.52	5.15	119.19	32.86	1.39214	-.65158	.63341	-1.08537	-1.16612	
FSJ_SS:		-.11155	.68821	-1.12974										
WARD:	10	92.14	7.52	.41	31.82	.34	.07	4.91	10.40	51.16	.64	1.88	13.58	33.84
PTOPAR:		58.48	15.40	.48	27.36	57.10	15.54	2.83	34.77	52.41	.01	.19	26.56	11.78
PSECML:		10.43	4.63	1.65	.21	.43	115.79	20.67	-.84377	.13467	-.10549	.27329	.35693	
FSJ_SS:		-1.03709	-.40235	-1.14980										
WARD:	11	98.60	1.24	.47	33.54	.07	.14	8.98	19.08	37.72	1.19	3.05	10.81	33.70
PTOPAR:		55.49	24.25	2.32	32.66	54.86	2.48	1.93	29.75	68.32	.02	.28	25.01	13.35
PSECML:		7.79	4.64	2.61	.55	1.75	227.45	2.81	-.73150	.57757	-.72955	-.49032	.04726	

FSJ_56: -.00368 .44272 .31330

WARD: 12 95.17 4.75 .38 37.59 .23 .08 10.82 15.38 35.52 1.85 3.91 12.47 52.65
PTDPAH: 34.88 19.45 .84 25.20 59.57 4.23 2.49 34.64 62.87 .01 .38 20.13 10.35
PSECML: 5.41 3.50 1.59 .32 .40 334.01 51.14 -.59769 -.32678 -1.18081 -.28544 -.39072
FSJ_56: -.67590 .83239 -1.46204

WARD: 13 95.60 4.06 .67 32.20 .26 .02 3.71 12.96 50.18 3.75 4.45 6.76 18.48
PTDPAH: 74.75 34.36 .46 14.33 54.39 21.28 2.69 23.22 74.09 .02 .44 37.98 26.87
PSECML: 9.00 7.79 10.01 3.92 2.25 103.08 18.93 1.97625 1.36091 -.05897 -.37087 1.52104
FSJ_56: .25759 -.02801 -.02859

WARD: 14 99.64 .26 .39 31.27 .31 .08 7.25 20.58 40.13 1.64 7.95 11.74 42.73
PTDPAH: 45.53 11.92 .34 43.41 52.12 4.47 2.80 30.00 57.20 .01 .31 26.48 12.52
PSECML: 7.97 3.99 2.37 .71 .43 76.86 10.50 -.62788 .25640 -.43703 -1.01574 -.57292
FSJ_56: -.89538 -.51174 -.50783

WARD: 15 96.86 3.13 .39 31.94 .35 .04 10.95 23.52 32.83 1.92 11.59 3.91 33.60
PTDPAH: 62.49 13.82 .37 49.09 46.45 4.47 2.29 25.44 72.27 .02 .27 31.08 14.28
PSECML: 10.45 5.54 3.84 .59 3.61 396.81 2.77 -.95750 1.41242 -.25937 -.53605 -.61555
FSJ_56: -.78775 -.57402 .24052

WARD: 16 99.04 .80 .33 34.85 .10 .14 11.85 21.05 31.68 1.94 8.41 19.70 51.20
PTDPAH: 29.09 16.18 1.56 30.23 57.83 1.95 2.67 31.54 55.80 .02 .19 22.29 8.90
PSECML: 5.92 3.08 .95 .12 1.37 251.56 82.32 -1.08838 .13793 -.97959 -.77768 -.94454
FSJ_56: .00356 1.37245 -2.52947

WARD: 17 95.52 4.28 .23 16.81 .59 .10 5.33 19.81 57.04 3.37 27.44 6.03 18.74
PTDPAH: 75.24 11.91 2.55 32.82 57.52 9.66 3.34 27.52 59.14 .05 .09 37.39 10.56
PSECML: 11.33 3.37 3.53 .55 .13 104.74 5.96 -1.27307 .47137 1.81144 -.19774 -.72172
FSJ_56: .86929 -1.03297 .13781

WARD: 18 99.66 .19 .89 24.32 4.32 .04 11.75 18.54 40.15 5.76 4.66 7.84 29.02
PTDPAH: 53.14 15.17 .93 45.84 92.53 18.24 2.27 26.09 71.64 .02 .10 35.10 11.04
PSECML: 12.82 4.14 2.79 .24 1.08 224.23 25.18 -2.33734 1.83279 1.27907 -.98224 2.95316
FSJ_56: .35518 1.72224 -.33659

WARD: 19 98.18 1.75 .35 22.44 .18 .09 12.81 22.74 41.38 6.11 9.43 1.84 25.10
PTDPAH: 73.05 19.59 .40 48.89 47.14 3.97 3.11 25.03 71.85 .02 .23 32.36 12.43
PSECML: 9.90 4.66 2.70 .32 4.03 167.99 5.37 -1.23365 1.25433 .57314 -1.00619 -.57523
FSJ_56: -.63285 -.84291 .60341

WARD: 20 96.47 3.49 .39 33.44 .14 .01 10.30 18.29 37.44 2.43 7.40 9.13 37.12
PTDPAH: 53.75 12.20 .86 47.81 15.90 7.61 3.06 28.38 53.56 .02 .30 24.25 12.11
PSECML: 7.39 4.23 2.06 .38 1.35 751.58 1.51 -.98780 .33030 -.88155 -.48372 -.29524
FSJ_56: -1.09761 -2.28551 .03716

WARD: 21 99.52 .30 .37 28.02 .37 .04 9.39 27.84 33.97 5.14 5.74 4.86 27.59
PTDPAH: 67.55 20.75 .64 49.38 48.29 2.32 3.53 25.77 70.59 .01 .15 32.24 12.12
PSECML: 9.87 4.21 2.37 .26 3.27 381.55 9.73 -1.17547 1.03324 .04317 -.87998 -.55882
FSJ_56: -.92989 -.85229 .39294

WARD: 22 98.98 .90 .27 22.89 .17 .01 13.35 21.54 41.75 5.90 15.79 5.89 7.19
PTDPAH: 75.93 16.81 .43 46.73 28.81 4.49 2.25 27.21 70.54 .03 .20 31.69 11.51

PSECML:	9.29	4.28	2.12	.11	1.19	302.34	14.42	-1.45436	1.17722	.68542	-.96299	-.76531		
FSJ_SS:	-.17801	-1.72810	.35171											
WARD: 23	48.56	51.23	.41	30.31	.30	.01	5.55	25.53	37.88	3.00	10.22	.89	8.26	
PTDPAM:	30.34	18.27	2.11	32.00	61.04	6.97	3.33	25.68	70.99	.01	.19	35.65	18.09	
PSECML:	11.41	7.04	3.59	.50	2.21	353.64	7.49	-.22076	.73953	-.62578	4.97630	.33238		
FSJ_SS:	.22557	.37502	.58164											
WARD: 24	62.62	37.36	.17	12.87	.64	.12	3.91	29.92	52.38	16.00	21.07	10.21	5.55	
PTDPAM:	34.24	7.74	.09	27.29	65.56	7.15	3.75	23.40	73.47	.01	.57	44.03	9.00	
PSECML:	14.20	3.42	2.25	.16	25.37	259.95	13.57	-.32945	.52041	2.44431	3.00110	-2.74741		
FSJ_SS:	-.56377	.01401	-1.55005											
WARD: 25	73.30	25.39	.40	28.51	.14	.01	4.38	18.99	47.55	6.53	8.51	5.96	12.83	
PTDPAM:	31.21	20.45	.58	31.54	63.18	5.28	2.03	22.41	75.55	.04	.33	35.79	18.98	
PSECML:	11.34	7.52	5.10	1.00	3.37	167.75	7.85	.18297	1.21936	.25333	2.06765	.37617		
FSJ_SS:	.24471	.45453	.45795											
WARD: 26	87.75	10.97	.43	36.22	.23	.01	5.12	20.47	37.52	2.87	3.85	6.30	26.22	
PTDPAM:	67.48	20.41	.59	39.76	55.99	3.25	2.12	29.62	68.26	.03	.23	27.49	14.92	
PSECML:	8.33	5.90	2.87	.51	2.17	720.82	.15	-.54185	.57026	-.88520	.93138	.32593		
FSJ_SS:	-.95735	-.31872	.51446											
WARD: 27	87.85	11.44	.38	30.12	.63	.00	4.76	24.39	39.71	3.13	10.55	3.95	13.20	
PTDPAM:	82.85	25.91	1.02	27.08	62.55	10.25	3.72	25.78	70.50	.03	.21	27.66	11.97	
PSECML:	8.42	4.47	3.60	.46	3.05	725.58	7.18	-.58961	.55871	-.22273	1.10103	.05092		
FSJ_SS:	-.30565	-.77216	.31559											
WARD: 28	34.33	15.18	.45	31.98	.22	.01	5.60	19.35	42.38	3.34	5.51	2.02	18.69	
PTDPAM:	79.29	15.68	.20	41.98	45.03	11.99	3.39	25.94	59.67	.02	.31	31.00	17.21	
PSECML:	9.34	6.82	4.83	.88	1.35	554.47	13.20	-.04039	.34755	-.51326	1.10259	.59781		
FSJ_SS:	-.91583	-1.34125	.23200											
WARD: 29	88.85	10.40	.46	31.93	.17	.04	4.45	14.97	47.97	4.30	4.86	10.86	35.19	
PTDPAM:	53.95	19.79	.53	29.47	53.97	5.57	3.50	30.27	55.13	.03	.45	30.96	17.13	
PSECML:	7.76	5.98	6.20	1.28	1.20	171.28	15.50	.51542	-.15693	-.30561	.42866	.27583		
FSJ_SS:	-.45999	.03137	-.14743											
WARD: 30	97.41	2.55	.43	35.05	.25	.08	5.80	23.18	35.21	4.52	2.93	22.48	23.44	
PTDPAM:	49.07	26.87	.73	23.42	70.72	5.86	1.82	28.24	59.94	.06	.49	24.59	14.31	
PSECML:	7.41	5.61	3.33	.79	.30	253.69	25.60	-.01231	.32849	-.71015	-.25324	-.15693		
FSJ_SS:	.89931	1.31465	-.41253											
WARD: 31	90.10	9.87	.39	34.30	.20	.53	12.29	14.00	38.29	6.09	4.37	15.07	35.74	
PTDPAM:	49.19	24.32	.67	24.59	59.73	5.68	2.62	33.68	53.70	.03	.45	28.75	13.52	
PSECML:	9.71	5.55	2.43	.35	.35	188.25	20.70	-.81858	.08573	-.11952	.31025	-.07106		
FSJ_SS:	-.01955	1.21512	.14985											
WARD: 32	95.86	4.09	.32	37.90	.51	.15	13.37	13.79	33.95	.35	4.73	23.29	59.35	
PTDPAM:	17.35	19.24	.70	24.70	70.73	4.57	5.42	43.75	50.83	.01	.22	20.31	8.59	
PSECML:	5.38	3.31	1.13	.05	.53	144.21	10.55	-1.24979	-2.23847	-.84779	.00980	-.48033		
FSJ_SS:	-.52300	.48713	.33799											
WARD: 33	97.73	2.24	.35	36.74	.54	.06	6.06	15.41	39.74	1.76	4.09	27.12	45.94	

PTOPAM:	25.94	27.53	1.85	17.17	79.54	3.18	5.30	43.31	51.83	.04	.32	23.94	10.95
PSECML:	6.87	4.32	2.18	.17	.37	182.65	5.65	-.42751	-2.33836	-.54459	.27217	-.42575	
FSJL56:	.37129	.75753	.78122										
WARD: 34	93.71	5.19	.31	35.54	.79	.34	4.02	14.38	44.52	9.43	2.50	18.98	53.31
PTOPAM:	27.71	25.65	1.03	23.75	73.65	2.58	5.40	41.54	53.05	.02	.22	24.98	10.72
PSECML:	7.58	4.23	2.45	.19	.87	142.32	1.78	-.53713	-2.19267	-.12576	.40251	-.35422	
FSJL56:	-.92512	.41133	.77273										
WARD: 35	95.91	2.53	.37	27.89	.29	.02	3.18	14.34	53.91	5.42	5.39	16.51	25.37
PTOPAM:	58.12	23.04	.75	15.97	78.58	5.35	4.05	31.40	54.55	.02	.36	39.23	15.71
PSECML:	10.51	6.05	7.53	.96	2.16	155.57	14.83	.64088	-.39912	.71276	-.02090	.03547	
FSJL56:	-.53177	.39056	.01519										
WARD: 36	94.60	4.59	.47	35.39	1.19	.17	3.01	13.43	45.33	1.47	2.96	28.49	41.23
PTOPAM:	30.28	10.51	.37	21.89	74.45	3.65	4.25	35.31	50.44	.01	.18	32.72	16.23
PSECML:	7.42	5.47	7.40	.76	.35	84.65	12.46	.43586	-1.03081	-.59937	.31844	.30649	
FSJL56:	-1.10345	.62810	-.77525										
WARD: 37	95.47	4.22	.53	39.20	1.59	.03	1.40	8.97	48.27	1.50	2.94	3.49	10.44
PTOPAM:	35.07	45.45	.34	4.90	33.44	5.55	3.29	15.95	80.75	.01	.29	35.61	21.11
PSECML:	8.32	8.40	8.74	1.56	9.55	169.41	13.02	1.57318	1.72931	-.39543	.38099	1.14517	
FSJL56:	-.03430	.93579	.29956										
WARD: 38	98.75	1.05	.51	39.67	1.17	.18	2.83	15.32	39.32	1.27	5.02	20.31	44.85
PTOPAM:	36.84	14.95	.62	28.80	67.31	3.39	3.99	35.30	60.72	.00	.33	25.04	16.92
PSECML:	5.95	6.59	5.65	.86	.97	102.64	25.40	.53790	-.61988	-1.18589	-.23902	.03414	
FSJL56:	-.97355	.29521	-.38620										
WARD: 39	98.27	1.65	.51	38.21	.94	.09	2.35	13.17	44.73	2.27	2.27	24.42	46.48
PTOPAM:	29.10	20.58	.45	27.13	58.76	4.11	3.15	34.87	51.98	.01	.34	27.36	15.29
PSECML:	7.11	6.63	5.11	.66	.70	199.07	5.41	.48591	-.73201	-1.03788	-.16514	.30151	
FSJL56:	-1.04904	.45199	-.25755										
WARD: 40	98.95	.92	.51	35.30	.58	.08	5.77	20.02	37.74	2.58	3.17	16.22	51.93
PTOPAM:	31.84	20.82	.62	23.80	73.28	2.92	2.63	35.76	51.61	.03	.52	28.88	15.35
PSECML:	7.62	5.94	5.67	1.14	1.78	27.20	19.99	.34761	-.40612	-.72002	-.50737	-.21877	
FSJL56:	-.11925	1.46273	-.36378										
WARD: 41	97.67	1.94	.45	30.54	.50	.11	2.83	11.83	53.72	.15	.17	22.08	25.59
PTOPAM:	51.33	2.16	.20	17.99	75.68	6.33	2.84	29.11	58.04	.01	.37	35.43	18.13
PSECML:	8.48	7.02	7.88	1.17	3.74	191.53	27.75	1.09822	.15885	-.25798	-.06205	.54926	
FSJL56:	-1.43173	.38522	-2.01021										
WARD: 42	97.73	1.86	.38	26.44	.55	.02	2.65	15.47	54.39	8.46	6.65	15.47	43.27
PTOPAM:	41.25	30.14	1.94	20.21	70.89	8.91	2.38	26.75	70.87	.01	.50	40.36	17.27
PSECML:	12.59	6.28	6.75	1.41	.31	316.71	13.98	.82318	.23984	.58323	-.58984	-.55140	
FSJL56:	-.39240	.71755	-.01057										
WARD: 43	97.43	2.19	.35	23.86	.54	.00	3.62	23.02	43.61	7.06	7.56	14.40	17.92
PTOPAM:	57.69	20.69	.50	23.32	59.45	7.23	3.19	26.25	70.55	.03	.31	41.20	17.58
PSECML:	10.48	5.55	8.38	2.02	7.28	100.38	15.17	.69118	.54319	1.03321	-.48429	-.44055	
FSJL56:	-.22734	.25159	-.39831										

WARD: 44	93.58	5.58	.33	15.21	5.04	.04	2.08	19.07	58.23	13.73	7.90	33.48	33.50
PTOPAR:	33.02	11.58	.22	11.18	58.95	29.87	4.04	37.97	57.99	.02	.27	43.51	10.43
PSECWL:	13.13	2.60	5.79	.93	17.37	88.65	15.88	-.30056	-1.65235	2.75694	-.19706	-.28771	
FSJLSS:	.11785	-.02270	-1.57576										
WARD: 45	90.80	8.73	.65	18.58	.66	.05	4.09	3.71	57.25	26.23	2.48	14.13	18.36
PTOPAR:	57.51	20.80	.48	6.08	75.31	17.61	4.85	34.27	60.88	.03	.22	57.05	14.85
PSECWL:	9.05	4.12	18.10	2.90	4.49	85.40	11.61	.52321	-1.30804	3.48509	.07678	3.05074	
FSJLSS:	-.98914	.64830	-.12127										
WARD: 46	93.36	3.79	.40	28.04	.34	.04	1.99	11.36	57.83	3.79	3.87	11.73	21.16
PTOPAR:	57.11	33.98	1.30	19.94	55.92	14.15	3.71	29.75	55.55	.06	.59	37.82	21.23
PSECWL:	9.21	5.75	8.71	3.05	3.20	100.33	3.57	1.64858	-.22050	.59833	-.28541	.03627	
FSJLSS:	.70003	-.33565	.82875										
WARD: 47	95.10	1.07	.42	33.22	.38	.13	4.70	15.76	44.38	3.83	4.52	16.58	37.68
PTOPAR:	65.73	35.11	1.24	22.78	71.89	5.34	2.51	31.72	55.77	.02	.35	34.87	18.19
PSECWL:	9.51	6.53	5.23	1.07	1.61	235.35	4.00	.34416	-.02175	-.22753	-.23814	-.12762	
FSJLSS:	-.00241	.89883	.79584										
WARD: 48	97.71	1.50	.37	25.33	.57	.17	25.65	10.77	37.14	10.34	6.70	18.43	37.25
PTOPAR:	44.32	34.80	2.27	16.17	70.46	13.37	4.20	36.13	59.65	.02	.22	37.78	14.00
PSECWL:	11.30	5.37	3.40	.46	5.47	87.36	10.22	-1.72519	-.45147	1.39414	-.55668	.38128	
FSJLSS:	1.26080	-1.41170	1.82638										
WARD: 49	85.52	2.43	.37	23.49	.58	.12	5.10	30.05	39.30	1.30	18.38	23.90	25.98
PTOPAR:	50.13	26.49	7.74	25.70	52.42	20.88	2.46	26.44	71.10	.04	.46	37.82	16.03
PSECWL:	9.85	5.43	5.54	1.30	17.59	55.47	45.47	.42425	.85292	.12053	.17071	-2.03707	
FSJLSS:	4.04346	.25800	-1.45920										
WARD: 50	87.95	3.97	.37	28.04	.55	.03	7.75	17.26	45.90	4.48	5.12	16.18	34.60
PTOPAR:	59.22	45.55	1.58	21.47	69.30	9.23	3.40	27.75	58.85	.03	.37	39.83	18.10
PSECWL:	11.04	6.23	5.01	1.07	2.45	217.46	11.82	.20277	.14871	.38214	.05234	-.42516	
FSJLSS:	.92708	.82570	1.28257										
WARD: 51	94.94	2.09	.31	24.28	1.86	.11	4.47	10.56	58.42	8.49	3.79	13.54	19.02
PTOPAR:	67.45	39.48	1.33	29.40	47.36	23.24	9.13	36.05	54.80	.02	.51	37.30	14.79
PSECWL:	10.93	4.87	5.18	1.58	4.32	16.54	30.37	.74722	-1.55943	1.25719	-.35636	-.44175	
FSJLSS:	.23362	-2.72348	1.13317										
WARD: 52	95.29	3.97	.45	40.91	3.39	.15	6.23	11.89	36.98	2.35	2.57	12.32	59.69
PTOPAR:	23.00	40.41	.32	39.09	55.74	5.17	3.08	38.09	58.83	.01	.17	25.36	13.37
PSECWL:	8.05	5.80	2.37	.20	2.01	112.07	1.15	-.83502	-.72385	-.93347	-.35960	.17099	
FSJLSS:	-.27313	.39006	1.55037										
WARD: 53	94.92	2.96	.47	32.72	1.07	.06	5.93	12.57	47.19	7.26	5.13	15.39	20.95
PTOPAR:	53.55	38.90	.49	21.13	55.05	12.82	3.97	33.51	62.52	.02	.29	33.91	17.04
PSECWL:	10.88	6.79	3.27	.49	1.88	75.14	7.55	-.02515	-.22960	.35431	.10809	.50333	
FSJLSS:	.24389	.00641	1.35563										
WARD: 54	98.47	1.04	.43	38.23	2.32	.30	4.46	12.83	40.93	3.67	2.35	16.87	15.74
PTOPAR:	56.39	38.54	1.95	30.11	57.38	12.52	4.54	32.81	62.55	.01	.29	30.53	17.37
PSECWL:	9.31	7.13	3.99	.52	2.00	22.09	7.17	.19017	-.01502	-.44535	-.16719	.22282	
FSJLSS:	.44192	-.79158	1.42336										

WARD: 55	99.14	.58	.60	42.50	1.33	.08	5.41	12.95	37.12	.92	2.37	21.26	19.02
PROPAR:	59.73	19.47	2.24	37.18	34.73	28.11	3.93	31.69	54.38	.01	.13	20.38	12.32
PSECTL:	5.95	4.83	1.88	.21	.56	72.77	21.10	-.55130	-.00290	-1.21170	-.21898	1.44814
FSCORE:	.73331	-2.06932	-.51188										
WARD: 56	95.32	3.24	.43	33.02	1.52	.24	3.34	14.08	47.38	1.86	3.83	25.85	37.39
PROPAR:	35.75	35.74	5.59	33.70	54.58	11.62	4.35	37.55	55.11	.02	.19	26.03	12.84
PSECTL:	7.58	5.04	2.71	.35	.09	26.97	9.17	-.33138	-1.23788	-.73138	.06231	-.04311	
FSCORE:	1.39383	-.56528	.93753										

NUMBER OF CASES READ = 56 NUMBER OF CASES LISTED = 56

PRECEDING TASK REQUIRED 3.70 SECONDS CPU TIME; 13.60 SECONDS ELAPSED.

```
5 )          FINISH

  5 COMMAND LINES READ.
  0 ERRORS DETECTED.
  0 WARNINGS ISSUED.
  5 SECONDS CPU TIME.
 17 SECONDS ELAPSED TIME.
    END OF JOB.
```