# AN ANALYSIS OF THE TREND AND INTER-REGIONAL VARIATION OF URBANIZATION IN BANGLADESH


by

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## Abstract

Bangladesh is characterized by rapid urbanization, backed by a huge base population. It is also characterized by heavy concentration of population in a few large cities. The national and regional trends of urbanization in Bangladesh for the last three consecutive census years 1981, 1991 and 2001 were studied in this research. It revealed that there is considerable spatial and temporal imbalance of urbanization in both divisional and regional (former district) level. For example the twenty regions of Bangladesh held the varying levels of urbanization ranging from about 10% to 60%. Along with this, regional inequality in the distribution of urban population was analyzed using Location Quotient (L.Q.) of different regions and Gini Index. The values of Gini-coefficients were found 0.314, 0.354 and 0.340 in the year 1981, 1991 and 2001 respectively. It indicates that the urban population distribution is unequal in the twenty regions. The aspects which are closely associated with level of urbanization such as percentage of urban land, urban population density, share of national urban population and share of national urban land were also studied here.

Again the distribution of urban centers according to population size is not uniform. At present Dhaka, the capital and largest city with over 9.7 million people, has about 33% of the total urban population. This study also analyzed the trend and nature of urbanization at different hierarchies of urban centers in Bangladesh viz. mega city, statistical metropolitan area, municipality etc. It was found that the rate of growth of population is several times higher in those urban centers compare to the expansion of urban areas thus increasing density of population in these areas. For example during 1991 to 2001 in mega city Dhaka the decadal variation of population and area were 49.1 percent and 1.34 percent respectively resulting increased density of population from 4795 persons/sq. km to 7054 persons/sq. km in the same interval of time.

This study was not only limited to the study of regional variation of urbanization. It explicitly analyzed some socio-economic and infrastructural factors affecting this variation with their relative and changing importance in this regard. For this purpose Bivariate Correlation Coefficients of the dependent variable i.e. level of urbanization with independent variables were measured for the three consecutive censuses. It was found that non-agricultural activities, level of industrialization, percentage of urban land, water supply coverage, sanitation coverage and electricity coverage are strongly positively correlated with level of urbanization all along. Moreover, it was found that all the factors are not equally significant with level of urbanization all the time. For example the variables rural-urban migration and literacy rate were found significant in the year 1991 but in 1981 and 2001 these were found insignificant.

In this study secondary data was used and the main source of data was the various census and annual reports conducted by Bangladesh Bureau of Statistics (BBS).

## Nomenclature

| | |
|---|---|
| AAGR | Annual Average Growth Rate |
| BBS | Bangladesh Bureau of Statistics |
| CUS | Centre for Urban Studies |
| ELEC | Electricity coverage |
| GDP | Gross Domestic Product |
| LU | Level of Urbanization |
| LOIND | Level of industrialization |
| LITER | Literacy rate |
| L.Q. | Location Quotient |
| NAA | Non-agricultural activities |
| OUA | Other Urban Area |
| PSA | Paurashava |
| PUL | Percentage of urban Land |
| RDLEN | Road Length |
| RUM | Rural-urban migration |
| SANI | Sanitation coverage |
| SNUL | Share of National Urban Land |
| SNUP | Share of National Urban Population |
| SMA | Statistical Metropolitan Area |
| UPD | Urban Population Density |
| WS | Water supply coverage |

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# CHAPTER 1 - INTRODUCTION

## 1.1 Background of the Study

Urbanization has been one of the dominant trends of economic and social change of the 20th century, especially in the developing world. This trend of urbanization is reflected in the growing size of cities and in the increasing proportion of the urbanized population. The 2005 Revision of the UN World Urbanization Prospects report described the 20th century as witnessing "the rapid urbanization of the world's population", as the global proportion of urban population rose dramatically from 13% (220 million) in 1900, to 29% (732 million) in 1950, to 49% (3.2 billion) in 2005. The same report projected that the figure is likely to rise to 60% (4.9 billion) by 2030. According to the UN-HABITAT Annual Report (2006), sometime in the middle of 2007, the majority of people worldwide will be living in towns or cities, for the first time in history; this is referred to as the arrival of the "Urban Millennium". In regard to future trends, it is estimated 93% of urban growth will occur in Asia and Africa, and to a lesser extent in Latin America and the Caribbean. By 2050 over 6 billion people, two thirds of humanity, will be living in towns and cities. Bangladesh is one of the most populous developing countries in the world, facing changes in its every aspect. Like other developing countries Bangladesh is also experiencing urbanization and this trend of urbanization is increasing gradually and steadily. Both the process of urbanization and the dynamics of growth of urban centers in Bangladesh are quite different from other developing countries in South and Southeast Asia. The nature and characteristics of urbanization has remained similar to the pattern during the British period despite the growth in the urban population (CUS, 1976). There was no significant industrialization in this part during the first half of Pakistani rule. The most phenomenal urban population growth in Bangladesh occurred during the 1961-74 inter-census period. Over 6 million people were living in urban areas constituting roughly 8 percent of the total population (BBS, 1987). Thus the percentage of increase of the urban population during those 13-years was striking. That accelerated growth was to a great extent the result of the very recent influx from rural villages. The growth rate of the urban population was 5 4% during inter-census 1981-1991 (BBS, 1997). The total urban population increased to 29.26 million by 2001 (BBS, 2003).

Factors influencing urbanization are quite different for less developed countries and for more developed countries in the world. There is a lot of migration from rural areas to urban areas in less developed countries. The reasons can be divided into two factors: (1) Rural Push Factors - more poverty, less work opportunities, limited education opportunities, fewer medical facilities, etc. and (2) Urban Pull Factors - possibilities of jobs, better education, better medical, better utility services and facilities, etc. On the other hand, there is less migration from rural to urban area in a more developed country because many infrastructures have been put in place for areas that are not in the city. Many people tend to stay in either urban areas or rural areas because they like it since many of the same opportunities are available a short drive away. There still are pull factors for both areas that can influence people which are: (1) Rural Pull Factors - small schools, lots of land, jobs, small community atmosphere etc. and (2) Urban Pull Factors - possibility of jobs, better/higher education, more hospitals, etc.

In Bangladesh, urbanization takes the form of rapid growth of urban population, largely due to natural growth and rural-urban migration (Khan 1982). Moreover territorial extension of existing urban areas and a change in the definition of urban areas is a major cause of urbanization in Bangladesh. From 1981 to 1991, percentage of urban land increased rapidly from 3.59 percent to 6.49 percent. Again in 2001, it rose to 7.43 percent. Here, urbanization has run to the front of industrialization, and the development of administrative and other service occupation, i.e. non-agricultural activities which are normally concentrated in cities. Although the administrative and organizational decisions, capital investments, technological innovations generally originate in the primate city and induced growth centers such as divisional and district headquarters, however, trickle down effects are not uniformly speeded spatially perhaps because of spatial variation in environmental/geographical conditions, and socio-economic infrastructures of the country. Infrastructure facilities are closely related to socio-economic changes and socio-economic development is treated both as a cause and effect of urbanization. In Bangladesh there exists a wide spatial inequality in the rates of urbanization and economic growth and development. Thus the trend of urbanization is not uniform throughout the country. There exist remarkable spatial, temporal and spatio-temporal variations in the level of urbanization at different levels in Bangladesh. Urban

population is concentrated in a handful of urban centers. In 2001, nearly 50.46 percent of the total urban population is concentrated in Dhaka, Chittagong, Khulna and Rajshahi Statistical Metropolitan Areas (SMAs) and the capital city Dhaka alone accounts for nearly 33.06 percent of the total urban population. These figures reflect that urbanization is not uniform throughout this country.

Urbanization is recognized as one of the most important developmental phenomena of the contemporary world. It is most significant both as an engine of economic growth and an agent of modernization. As in Bangladesh the higher level of urbanization is concentrated in few regions and these regions face lots of problems e.g. poverty, inequity in resource distribution, slums and squatter settlements, environmental hazards, crimes, severe congestions, public health problems, etc. due to high population density. It is a crucial need to decrease regional variation in urbanization to ensure development of every region in a balanced way. However, urbanization is a normal process of development activities and big cities can play a positive role in it. The point at issue is the regional variation of urbanization resulting uncontrolled growth of urban population in big cities which needs urgent attention

## 1.2 Rationale of the study

In Bangladesh the study of urbanization has not yet been spread out with proper importance; especially researches on urbanization with its spatio-temporal variations are rare. Most of the studies on urbanization in Bangladesh are descriptive and they seldom apply quantitative techniques. There are number of studies on urban growth in Dhaka city and in those studies the terms urban growth and urbanization were used interchangeably though they are two different concepts. There are some researches linking urbanization with economic development or econometric analysis of urbanization in Bangladesh. As Dhaka is the most important and pivotal urban centre in the country where about 40 percent of the urban population reside, consequently many researchers are involved studying urbanization in respect of Dhaka city. Rouf (1999) made an econometric analysis of urbanization for the year 1891-1991; he analyzed the trend and pattern of urbanization in Bangladesh and gave a model of urbanization. That model was based on some factors most of those were economic factors. The present study will include a new decade 1991-2001 over that study and it will

explicitly analyze the inter-regional and intercensual variation of urbanization and the factors affecting this variation. It will provide a new insight into the prospects and problems of urbanization among the regions.

The trend analysis of any dynamic process is usually carried out for specific period of time and place. This study will analyze the trend of urbanization in Bangladesh for the period of 1981 to 2001 i.e. for the last three consecutive census years. It will also study the nature of urbanization at different hierarchies of urban centers. As in Bangladesh the higher level of urbanization is concentrated in few higher order urban centers e.g. metropolitan areas and these areas face serious problems due to high population density. It is a crucial need to decrease regional variation in urbanization to redistribute wealth, power and facilities to its inhabitants. This study will analyze the regional variations in the level of urbanization and also the various factors (economic, demographic, social, and infrastructural) contributed to this variation. Further it will measure the changing importance of the factors affecting regional variation including their relative importance in this regard. This will help policy makers to allocate resources among the regions so that regional equality in development and consequently in urbanization is maintained.

### 1.3 Literature Review

Chaudhury (1980) attempted to study the national and regional patterns of urbanization for the period 1901-1974. To study regional patterns of urbanization, Bangladesh was divided into four major regions on the basis of geographical and administrative set-up: Central Region i.e. Dhaka Division, Eastern Region i.e. Chittagong Division, Southern Region i.e. Khulna Division and Northern Region i.e. Rajshahi Division. To explore the regional variations in urbanization the author identified some factors affecting regional variations in urbanization; those were called as selected economic characteristics by region. Those were employment activities of economically active persons, industrialization, literacy rate, electricity supply coverage, dependency ratio, etc. The author found a positive correlation between socio-economic development of a region and its level of urbanization. It also examined some components of urban growth and assessed the impacts of urbanization on national economy. Though it was a good study on the complex process of urbanization in Bangladesh but it was not out of limitation. Firstly, it studied urbanization only at the

division level whereas districts are considered as one of the most important administrative set-ups in Bangladesh. Secondly, expansion of urban area is an important cause of urbanization in Bangladesh. But it was totally overlooked in this study. Lastly, the author did not perform any quantitative analysis of urbanization though he described some factors of urbanization.

Laskar (1983) attempted to utilize the limited data available to provide some insights into the rates of urbanization in Bangladesh, explore regional variations and factors of urban growth for the period 1901-1981. This study indicated that although about 90 percent of the total population lived in rural areas there was a persistent and accelerating trend towards urbanization. Similar to the previous study it also showed the percentage distribution of urban population dividing Bangladesh into four regions on the basis of its administrative setup: Dhaka, Chittagong, Khulna and Rajshahi Divisions and these were called by Central, Eastern, Southern and Northern regions respectively. It was found from this study that the regional variations in terms of levels of urbanization seem to be disproportionate. It observed that the central region dominated the urban structure of Bangladesh and accounted nearly half of the total urban population in 1974 and also in 1981. It also found that in all the regions the average annual rate of growth of urban population was higher than of rural areas in most of the decades. In this study the terms "Urbanization" and "Urban growth" were used interchangeably. It also made an attempt to illuminate the implications of urbanization. Though in this study emphasis was placed on demographic aspects of urbanization it provided the basis for comparative insights for further research.

Rouf (1999) made a study on the trends and patterns of urbanization on the basis of econometric analysis. This study also measured the potentialities of the factors towards urbanization. It analyzed the national and regional trend of urbanization for the period of 1891-1991. It also made quantitative analysis of the variables through Bivariate Correlation Coefficient and Multivariate Regression Analysis. Most of the factors of urbanization used for this study were economic factors, such as level of industrialization, GDP per capita, poverty level, agricultural productivity, etc. The analysis was based on cross-sectional data; it considered only the quantitative variables; no dummy variable was included here.

Rahman (2004) in his study attempted to examine various aspects of urbanization and spatial inequalities in economic development in Bangladesh. The spatial and temporal patterns of urbanization and spatial development were examined by interpreting separately the eighteen variable data on urbanization and spatial development. Factor and cluster analyses techniques were used to identify the nature and spatial patterns of urbanization and spatial development separately for the year 1991. The results show wide spatial and temporal variations in terms of urbanization and spatial development. This study assumed that both urbanization and spatial development are interrelated and spatial development follows urbanization. In fact, urbanization is viewed both as cause and effect in socio-economic development accompanied by demographic and cultural change (Rouf, 1999, p.9).

Rouf and Jahan (2007) studied the spatial and temporal patterns of urbanization in Bangladesh. It analyzed the trends and patterns of urbanization in Bangladesh from 1891 to 2001 with special emphasis on the period of 1974-2001. They studied urbanization in various levels - national, divisional and regional levels. It also distinguished the terms urbanization and urban growth with real data. It measured consistency of the regions regarding their level of urbanization with respect to their respective share of urban population. Finally it showed that the rate of urban growth is higher for the administratively important regions like Dhaka, Chittagong, Khulna, etc. It did not include the demographic, social and economic factors of urbanization but it depicted a clear picture of the changing pattern of urbanization from census to census and in different hierarchies of urban centers.

### 1.4 Theoretical Framework of the study

The contemporary urban theory advocates a theory of "created environment," which is related to major patterns of political and economic change. Thus, Harvey (1985) views urbanism as one aspect of the created environment through restructuring of space brought about by the spread of industrial capitalism. Capitalist society must of necessity create a physical landscape--a mass of humanity constructed physical resources – in its own image, broadly appropriate to the purposes of production and reproduction. Therefore, urban primacy of the Third World could be understood by the process of restructuring, export of industrial operations by the "core" nations to poor "peripheral" nations. Thus, the Third

World urbanization is the result of the process of "deindustrialization" of the advanced capitalist nations.

However, given the United Nations' (2002) findings that in near future, Dhaka in Bangladesh would be the second largest city in the world and that Bangladesh's rate of urbanization would be the highest in the world, it is important that we extend our analysis to Bangladesh. According to Ahmed (2004) the urbanization of Bangladesh can be divided into three phases: pre-colonial, colonial and post-colonial. The urbanization during the pre-colonial phase was related to the political history of the country, especially to the evolution of state. It was the despotic nature of the hydraulic state and the monopolization of the means of violence by it that prevented the development of urban community in the Western sense of the term. The social weakness of the indigenous merchants was also a deterrent factor in the establishment of urban autocephaly in Bangladesh. The magical barriers of the Hindu caste and the Muslim clan prevented the fraternization of the Pala, Sena, Afghan and Mughul trade guilds. As a result, urbanization became apolitical. It remained an adjunct of fortress. During the Mughal period, Dhaka was the provincial capital of Bengal and it flourished at the expense of Pandua, the former capital during the Afghan regime. Artisans like goldsmiths, conch-shell makers and spice traders migrated to Dhaka from Pandua and settled here (Karim, 1956). Similarly, when the capital was transferred to Murshidabad from Dhaka, the latter was reduced to a glorified village and the former became one of the largest cities of that time (Ahmed, 1948). The defeat of Siraj-Ud-Dollah at the battle of Plassey started a new era of colonization, Westernization and sponsored urbanization began. The urbanization that began to take its roots in Bengal during the colonial and post-colonial period exhibited a different pattern. The most distinguishing feature was its dependency on the colonial industrial/administrative maneuver. A new phenomenon of metropolitanization began at the expense of city and the city lost its indigenous community character. In that time colonial economic interest led to the rise and fall of urban centres like Comilla, Brahmanbaria, Sirajganj, Pabna, Jamalpur and Madaripur throughout the century.

Bangladesh is still an agrarian society though nearly one quarter of the population lives in the urban areas. The interregional variation in urbanization indicates the unstable economic

growth and lack of urban policy in the regions of Bangladesh. Here, the urban expansion has occurred only in terms of population size, devoid of urban facilities, let alone urbanism.

Table 1.1 provides the proportion of total population residing in the urban areas of Bangladesh in the various census years of the last century, their intercensal variation and annual average rates of growth. It shows a gradual increase in both number and percentage of urban population. According to Rouf (1999) the time span from 1901 to 1991 has been divided into three periods- period of sluggish growth (1901 to 1921), period of moderate growth (1931-1961) and that of rapid growth (1971-1991). The relatively low level of urbanization during the period 1901-1921 may be attributed to the profit motive strategy of the British colonial government to destroy indigenous industries and to build up industrial-commercial agglomeration around Calcutta that virtually turned the area which is today Bangladesh into its rural hinterland. A slight increase both in the level of urbanization and growth rate were recorded in the period 1931-1941. During 1941 to 1951 the annual average growth rate declined from 3.66 to 1.70 though proportion of urban population increase in absolute sense. The lower growth rate of urban population during 1941-1951 might be the effect of devastating Bengal Famine, the Second World War and the partition of India in 1947. From 1961 a significant increasing trend was found in all respects. During the period 1961-1974 the highest ever intercensal variation (137.57 percent) was observed in urban population. This sharp acceleration of urban population growth during the period of 13 years (1961-1974) may be attributed to some industrial development and the independence of Bangladesh in 1971. The large number of urban population since 1981 is due to the definitional change of urban area in those censuses. The high urban growth rate from 1974 through 2001 was due to the extended definition of urban area in 1981. Though the urban population has increased from 2.4 percent in 1901 to 23.1 percent in 2001, the exponential growth rate indicates much slower growth for the period, from 1.4 during 1901-2001 to 3.2 during 1991-2001. The overall trend of urbanization in Bangladesh is upward, unstable and periodically fluctuating.

Table 1.1: Urbanization in Bangladesh, 1901-2001

| Census year | Total population | Urban population | Percent urban | Variation | Exponential growth rate |
|---|---|---|---|---|---|
| 1901 | 28,928,000 | 702,035 | 2.43 | - | - |
| 1911 | 31,555,000 | 807,024 | 2.56 | 14.95 | 1.39 |
| 1921 | 33,254,000 | 878,480 | 2.64 | 8.85 | 0.85 |
| 1931 | 35,604,000 | 1,073,489 | 3.02 | 22.20 | 2.00 |
| 1941 | 41,997,000 | 1,537,244 | 3.66 | 43.20 | 3.59 |
| 1951 | 42,063,000 | 1,819,773 | 4.33 | 18.38 | 1.69 |
| 1961 | 50,840,000 | 2,640,726 | 5.19 | 45.11 | 3.72 |
| 1974 | 71,479,000 | 6,273,602 | 8.78 | 137.57 | 6.66 |
| 1981 | 87.120,000 | 13,228,163 | 15.18 | 110.85 | 10.66 |
| 1991 | 106,314,000 | 20,872,204 | 19.63 | 57.79 | 4.56 |
| 2001 | 123,851,120 | 28,605,200 | 23.10 | 37.05 | 3.15 |

Source: BBS, 2003

But this trend of urbanization is not uniform throughout the country. The interregional disparity or variation in the process of urbanization and some factors affecting regional variations in urbanization were explored by Chawdhury (1980) for the period 1901 to 1974. In that study the author divided Bangladesh into four regions. The author of the present research felt keen interest and enthusiasm to study the regional variations in urbanization and to investigate the factors of these variations along with studying the trend of urbanization in Bangladesh after Chawdhury (1980) i.e. for the period 1981-2001.

According to Ahmed (2004) a retarded trend towards primacy within among urban hierarchies in Bangladesh is demonstrated. Usually, primate cities in a given country range as much as thirty times greater in population than the same country's next largest city (Gottdiener, 1994 cited in Ahmed 2004). In the case of Bangladesh, according to the population census 2001, Dhaka's population is 3 times greater than the next largest city, Chittagong. Similarly, Chittagong's population is 2.5 times greater than the next largest city, Khulna. Whereas Khulna's population is around 2 times greater than the next largest city, Rajshahi Given that, Bangladesh's urban experience does not fit the pattern of the Third World urbanization either. In terms of primacy, the pattern is more similar to the developed countries rather than the Third World.

## 1.5 Objectives of the study

The specific objectives of the present research work are as follows:

i. To study the trend and nature of urbanization in Bangladesh for the last three consecutive census years.

ii. To study the inter-regional variations of urbanization in Bangladesh.

iii. To understand the factors affecting regional variations in urbanization and their changing and relative importance in this regard.

## 1.6 Outline of Methodology

To fulfill the above mentioned objectives the methodology of the study consists of the following steps:

### 1.6.1 Study Design

The research has been designed to give an explanation for changes in the process of urbanization in Bangladesh and among its regions *Firstly*, national trend of urbanization in Bangladesh for 1981, 1991 and 2001 census years will be analyzed on the basis of level of urbanization. *Secondly*, the nature of urbanization will be studied at different hierarchies of urban centers such as mega city - Dhaka. Statistical Metropolitan Area (SMAs). municipal area. *Thirdly*, to study the regional variations of urbanization, Bangladesh will be divided into twenty regions (former districts) and the level of urbanization will be calculated for each region. *Fourthly*, various socio-economic, demographic and infrastructural factors affecting regional variations in urbanization such as rural-urban migration, percentage of urban land, level of industrialization, non-agricultural activities, literacy rate, length of paved road, electricity coverage, water supply coverage and sanitation coverage will be studied.

### 1.6.2 Data Source

The most important sources of statistics on urbanization in Bangladesh are the decennial census reports. In this study secondary data will be used and the main source of data will be the various census and annual reports conducted by the Bangladesh Bureau of Statistics

(BBS). The present study utilizes data from various reports such as National Report, Urban Area Report, Statistical Year Book. Zila Series, etc. of the population census 1981, 1991 and 2001. Moreover, relevant information has been collected from a number of national and international publications, journal, books, government documents and other published and unpublished materials.

### 1.6.3 Data Analysis and Processing

In this study time-series cross-sectional data are used. Data collected from various sources has been analyzed statistically and presented in tabular and graphical forms. Location Quotient (L.Q.) and Gini Index have been used to measure the regional inequality of urbanization. Bivariate Correlation Analysis has been applied to measure the significance of the factors affecting regional variations in urbanization and their changing and relative importance in this regard. Data analysis will be made using spreadsheet program Microsoft Excel and Statistical Package for Social Scientists (SPSS 11.0). The maps have been prepared using ArcView GIS 3.2.

## 1.7 Scope and Limitations of the Study

Urbanization has been recognized as one of the most important developmental phenomena of the contemporary world. In Bangladesh research on various aspects of urbanization has not been widely undertaken yet. One of the main reasons of this fact is the unavailability of relevant data and discontinuity of data in census report.

However the main limitation of this study is that Urban Area Report for the recent census 2001 has not yet been published. There is no data on rural-urban internal migration, sanitation and electricity coverage for 1981census. For this reason, it cannot identify the contribution of these factors towards urbanization up to 1981. As, data on internal migration was not available for 2001, here to study the importance of migration on urbanization migration data for 2002 collected from Report of Sample Vital Registration System 2002 of BBS (2004) was used as proxy data in lieu of real data.

## 1.8 Organization of the Study

In attempting to fulfill the research objectives, the main efforts have been directed toward data collection through secondary survey and study of relevant literature. The result of these efforts is presented in the following six chapters:

Chapter one describes the background of this research with the rational of conducting this. The review of literature is an important content of this chapter. The objectives and methodology for achieving the objectives are stated here along with the scope and limitations of this study.

Chapter two discusses some conceptual definitions, measurements and the techniques used in this research work.

Chapter three illustrates the trend of urbanization in Bangladesh at the national, divisional and regional levels. This also makes a comparison of the various aspects closely associated with urbanization both in divisional and regional levels. All these are conducted for the period 1981 to 2001.

Chapter four assesses the nature of urbanization at different hierarchies of urban centers in Bangladesh. In doing this it examined the trends of growth of urban centers on the basis of population size and land area of these urban centers.

Chapter five analyzes the regional variation of urbanization and the factors affecting this variation. Regional variation of level of urbanization is compared with Gini-coefficients for the year 1981, 1991 and 2001. The relative and changing importance of the factors influencing regional variation of urbanization is measured by Bivariate Correlation Coefficients of the factors.

In the last chapter an attempt is made to summarize the findings of all the preceding chapters and conclusion is drawn about the research. Some recommendations are provided on the basis of the study findings. Lastly some thoughts towards further research work as a follow-up to this research has been implied in this chapter.

# CHAPTER 2
# CONCEPTUAL DEFINITIONS, MEASUREMENTS AND TECHNIQUES

## 2.1 Introduction

Cities and towns are centers of politics, economy, culture, as well as science and technology for a country or a region. Cities are concentrated space of mass production; cities of a country together represent the national capacity of influence, governance, and competitiveness in the world. Level of urbanization is an important hallmark of modern civilization. Urbanization is a process of concentration of people, wealth, technology and services in a country or a region; it also represents transformation of life style, mode of production, social organization and culture. During the process of urbanization, cities congregate human wisdom and achievements on the one hand, and concentrate conflicts in the economy, society and population, resources and environment on the other hand.

Urbanization is a process of economic and social development that consequentially emerges with industrialization and modernization, also an important hallmark of civilization and development in a country or a region. To have a complete understanding of urbanization process. concepts, definitions and measurements relevant to this should be made clear. The techniques used in this study to analyze regional variation of urbanization has been made clear here.

## 2.2 Contemporary World Urbanization

The urban transition is labeled as a "profound human transformation," or as a second transformation, which is "comparable to the domestication of plants and animals ten thousand years ago that made a sedentary life possible" (Gugler, 1997 cited in Ahmed, 2004). The twentieth century is seen as the "century of the urban transition" as half the world's population will live in urban areas by the end of the century (Gugler, 1997 cited in Ahmed 2004). There are number of characteristics of **contemporary world urbanization.** The United Nations (2002) has identified 20 major key features of world urbanization. Of them, the most important ones are:

(1) The world's urban population reached 2.9 billion in 2000 and is expected to rise to 5 billion by 2030. Whereas 30 percent of the world population lived in urban areas in

1950, the proportion of urban dwellers rose to 47 percent by 2000 and is projected to attain 60 per cent by 2030.

(2) Virtually all the population growth expected at the world level during 2000-2030 will be concentrated in urban areas. During that period the urban population is expected to increase by 2.1 billion persons, nearly as much as will be added to the world population, 2.2 billion.

(3) Almost all of the population increase expected during 2000-2030 will be absorbed by the urban areas of the less developed regions whose population will likely rise from approximately 2 billion in 2000 to just under 4 billion in 2030.

(4) Rural-urban migration and the transformation of rural settlements into cities are important determinants of the high population growth expected in urban areas of the less developed regions over the next thirty years.

(5) There are marked differences in the level and pace of urbanization among the major areas constituting the less developed regions of the world. Latin America and the Caribbean as a whole is highly urbanized, with 75 per cent of its population living in urban settlements in 2000, a proportion higher than that of Europe. Moreover, this proportion is twice as high as the one estimated for Africa or Asia.

(6) Despite their high levels of urbanization, the combined number of urban dwellers in Europe, Latin America and the Caribbean, Northern America and Oceania (1.2 billion) is smaller than the number in Asia (1.4 billion), one of the least urbanized major areas of the world in 2000. Furthermore, by 2030, Asia and Africa will each have higher numbers of urban dwellers than any other major area of the world, and Asia will account for 54 per cent of the urban population of the world, up from 48 per cent in 2000.

(7) Most of these large cities are located in developing countries. With 26.5 million inhabitants, Tokyo is the most populous urban agglomeration in the world in 2001, followed by São Paulo (18.3), Mexico City (18.3), New York (16.8) and Mumbai (16.5). By 2015, Tokyo will remain the largest urban agglomeration with 27.2 million inhabitants, followed by Dhaka, Mumbai, São Paulo, Delhi and Mexico City, all of which are expected to have more than 20 million inhabitants.

(8) Thus, Dhaka in Bangladesh grew at an average annual rate of 7.0 per cent during 1975-2000 and Delhi in India increased at a rate of 4.1 per cent annually over the same period. But they are exceptional cases. Among the 17 mega-cities as identified in 2001, just 5 grew at rates above 3 per cent per year and 8 experienced moderate or low growth (below 2 per cent per year). In the future, just four of today's mega-cities will exhibit growth rates of 3 per cent or more (Dhaka, Delhi, Jakarta and Karachi).

One of the most striking features of contemporary urbanization is the predominance of the Third World, where two-thirds of the world's urban population lives. "The urbanization process in the Third World is multi-faceted and is characterized by various features: (a) primacy and over urbanization, (b) protracted poverty, (c) rural-urban migration, (d) informal labour market featured by widespread unemployment and underemployment, (e) misallocation of labour, (f) inadequate urban housing and services, (g) populist pressure on governance, (h) changing nature of class conflict between rural classes and urban classes and (i) low life chances like high infant mortality rates, low life expectancy, limited access to health care, low levels of literacy and limited years of schooling, and insufficient diet.
The Third World states, by their "urban bias" in the economic development of the nations, have unwittingly created the antagonism between urban and rural classes. Thereby ensuing series of political protests and picketing along with traffic jam, which has become a regular feature of the Third World cities. (Ahmed, 2004)"

### 2.3 Definition of Urbanization

Urbanization is the process by which there is an increase in the proportion of people living in urban areas. It is measured as a ratio of total urban population to the total population of any region or county. Therefore, increase in level of urbanization certainly means increase in number of urban population. Again, urbanization is an indicator of development and therefore it is the inevitable destiny of the human population. The proportion of urban population increases with the socio-economic development of the country.
In different times urbanization has been defined in different ways by different people-

Urbanization is the process of becoming urban, moving to cities, changing from agriculture to other pursuits common to cities and the changing and corresponding changes of behaviour patterns (Mithchell, 1957 cited in Rahman, 2002).

Thompson in his article 'Urbanization' in the Encyclopedia of Social Sciences writes that urbanization is characterized by "the movement of people from small communities concerned chiefly or wholly with agriculture to other communities generally larger whose activities are centered with Government, trade, manufacture or allied interests"(Rahman, 2002).

Urbanization is the process which reveals itself through temporal, spatial and sectoral changes in the demographic, social, economic, technological and environmental aspect of life in a given society (Misra, 1978).

### 2.3.1 The process of urbanization

Urbanization is increasing in both the developed and developing countries. But the process of urbanization is not same in the developed and developing countries.

***The Process of Urbanization in Developed Countries***

Urban areas are usually thought to be centers of business, commerce, industry, and population. Urbanized essentially means the proportion of the population living in urban places. Early in the Unites States history urban areas were far outnumbered by rural areas. Yet, every year more and more cities are considered urban. These cities were located close to transportation routes either waterways, rails, or roads. In the 1800's cities began to grow in importance as centers of commerce and industry but due to transportation constraints in order to participate in these opportunities people had to live in the city center otherwise they were located in the rural periphery that supplied raw materials to cities population. The opportunities presented by industrialization increased the rural to urban migration and cities began to grow.

By the middle of the 1900's cities began to sprawl out from the center into suburbs consequently city's population density began to decrease. People and businesses began to move out from the central city. This phenomenon was facilitated by the broadening of

transportation networks including the creation of subways and more roads. In the past few decades the increase in service related industries makes distance to the city center more flexible for businesses.

In many countries, the population and wealth generated by agriculture and mining started the first steps towards the process of urbanization. For example São Paulo, Brazil the leader in coffee production, commenced the formation of a network of cities. involving the states of Rio de Janeiro and Minas Gerais.

***The Process of Urbanization in Developing Countries***

The process of urbanization has occurred differently in much of the developing world. Historically many of these countries were former colonies. They have some of the highest rates of population growth and the largest urban areas. They are characterized as being poor having significantly less technology then the developed world, and a very rapid transition from rural to urban societies. Whereas in developed countries, the rural to urban migration was facilitated by large-scale industrialization and the need for labor, in the developing world this is not the case. Rather, population is placing a great deal of pressure on urban areas and without having the benefit of industrialization the lack of employment opportunities for the mass of urban migrants is undermining the ability of cities to incorporate people. The consequences of this lack of employment opportunities are growing urban areas a large percent of whose population are unemployed and living in poverty and forced to live in unsanitary squatter settlements.

For example in Bangladesh, during the British Colonial rule, the level of urbanization was low because of their exploiting attitude. From 1960s the pace of urbanization got momentum and has been continuing because of some industrial development and the emergence of Bangladesh as a sovereign nation. After 1974 level of urbanization is increasing but at a decreasing rate. Flexibility of the definition of urban area and rural-urban migration is highly responsible for accelerating the growth rate of urban population (Rouf, 1999). This upward trend of urbanization is reflected at the regional level but with remarkable spatial, temporal and spatio-temporal variations at different regions. In

Bangladesh urban population is concentrated in a handful of urban centers. In 2001, 50.46% of total urban population is concentrated in Dhaka mega city and other three SMAs.

### 2.4 Causes of urbanization

In terms of a place, urbanization means increased spatial scale and/or density of settlement and/or business and other activities in the area over time. The urbanization typically involves the transformation of peripheral population from rural to urban, together with the settlement of incoming migrants. Urbanization could occur as a result of natural expansion of the existing population, however urban fertility rates tends to be lower than rural.
Urbanization and city growth are caused by a number of different factors including rural-urban migration, natural population increase, and annexation. Because the rates of natural increase are generally slightly lower in urban than in rural areas. the principle reasons for rising levels of urbanization are rural–urban migration, the geographic expansion of urban areas through annexations, and the transformation and reclassification of rural villages into small urban settlements. The expansion of the metropolitan periphery can be caused both by the arrival of new migrants and by the sub-urbanization of the middle class out of the central city. The relative importance of each of these various causes of urbanization and suburbanization varies both within and between regions and countries (Cohen. 2006)

In Bangladesh urbanization has been taking place in three ways. These are: (1) Area expansion, (2) Rural to urban migration and (3) Population growth (BBS 1997, p.6).

Islam (1999) agreed in favor of these three causes and mentioned that urbanization and urban growth taken place through a combination of three components, such as (a) natural increase of the native urban population, (b) area redefinition or reclassification or annexation and (c) rural-urban (or other forms of internal) migration. In Bangladesh, as in some other developing countries, the rate of urbanization is extremely high and it is more than two to three times than that of the national population growth rate. In this situation, the role of all the above mentioned three components is important, and it is dominant in the city specific cases. The contribution of these three components to urban growth by cities is evident from Table 2.1.

Table 2.1: Components of population growth in 6 major cities of Bangladesh, 1961-1974

| City | Population | | Natural Increase (%) | In-migrants (%) | Annexation (%) |
|---|---|---|---|---|---|
| | 1961 | 1974 | | | |
| Dhaka | 521034 | 1679572 | 18 | 74 | 8 |
| Chittagong | 364205 | 889760 | 28 | 43 | 29 |
| Khulna | 175023 | 437304 | 27 | 73 | - |
| Narayanganj | 162054 | 270680 | 41 | 17 | 42 |
| Mymensingh | 53256 | 182153 | 17 | 25 | 58 |
| Rajshahi | 56885 | 132909 | 30 | 36 | 34 |

Source: Khan, 1982, p. 384

## 2.5 Consequences of Urbanization

Urbanization and urban growth occurring due to migration (and other factors) have both positive and negative consequences and impacts (Islam, N. 1999).

Some of the positive consequences of urbanization are the following:

- Economic benefits: higher productivity, better income etc.
- Demographic benefits: lowering of age at marriage, reduction of fertility rate etc.
- Socio-cultural benefits: modernization
- Political benefits: empowerment, democracy etc.
- Improved access to information technology.

Urbanization is not an unmixed blessing. Its negative consequences are of great concern. These assume critical role under situation of rapid and uncontrolled or unplanned urbanization.

The negative consequences can be grouped as the following:

- Environmental consequences.
- Encroachment on productive agricultural land and forests.
- Extreme pressure on housing, growth of slums and the pressure on urban services.
- Economic consequences, leading to income inequality and poverty, ill effects of globalization.
- Social consequences, resulting in increased violence and crime, social degradation.

- Cultural consequences: entry of alien culture, loss of national cultural identity.
- Political consequences: Criminalization of politics.

## 2.6 Measures of Urbanization

In studying urbanization often level of urbanization and urban growth are used synonymously. But there exists significant conceptual distinction between them. These two measures of urbanization are defined here:

***Level of Urbanization:***

Urbanization refers to the proportion of a nation's population living in the urban areas. The level of urbanization may be denoted as,

$$U^n = ( U_p / T_p ) \times 100$$

Here, $U^n$ = Level of Urbanization

$U_p$ = Total Urban Population

$T_p$ = Total Population

So, urbanization is indicated by an increase in $U^n$ over a period of time. For instance, in 1981, the total population of Bangladesh was 87.53 million and the urban population was 13.56 million. Hence,

$$U^n_{81} = (13.56 / 87.53) \times 100 = 15.50\%$$

In 1991, the total population was 105.90 million and the urban population was 20.87 million. Therefore,

$$U^n_{91} = (20.87 / 105.90) \times 100 = 19.71\%$$

Again in 2001, the total population was 124.36 million and the urban population was 29.26 million. Hence,

$$U^{n}_{2001} = (29.26 / 124.36) \times 100 = 23\ 53\%$$

Thus, over the last three successive census periods, the proportion of urban population in Bangladesh increased significantly. Hence, these figures of level of urbanization appear that there is a rising trend of urbanization in Bangladesh.

***Urban growth:***

Urban growth refers to an increase in the total urban population. On the other hand, urbanization refers to an increase in the percentage of urban population to total population. So, there may be urban growth with or without urbanization. As for example, between 1991 and 2001, the urban population of Hill Tracts region increased from 324315 to 433989, indicating an annual average growth rate of 2.93 percent; but during the same interval of time the level of urbanization declined from 33.28 percent to 32.58 percent. Thus, during the decade 1991-2001, Hill Tracts region had experienced an urban growth with negative urbanization.

## 2.6 Aspects closely associated with level of urbanization

The aspects which are closely associated with level of urbanization are discussed here

***Percentage of Urban Land (PUL):***

It is the ratio of the total area of urban agglomerations to the total area of a district which is expressed in percentage. It will be calculated by the following formula-

$$\mathbf{PUL = (DU_a / DT_a) \times 100}$$

Here, $DT_a$ = Total area of a district

$DU_a$ = Total area of its urban agglomerations

***Urban Population Density (UPD):***

It is frequently used in the analysis of urbanization. It is the ratio of urban population to the total area of a district. Let, total urban population and total area of a district be $DU_p$ and $DT_a$ respectively. Then

$$\mathbf{UPD = DU_p / DT_a}$$

***Share of National Urban Population (SNUP):***

It is simply the percentage share of a district's total urban population in the total urban population of the country. It can be defined as—

$$\mathbf{SNUP = (DU_p / U_p) \times 100}$$

Where, $U_p$ = Total urban population of the country

$DU_p$ = Total urban population of a district

***Share of National Urban Land (SNUL):***

It is the percentage share of urban land of a district in the total urban land of the country. Let, total urban area of the country and that of a district be $U_a$ and $DU_a$ respectively, then

$$\mathbf{SNUL = (DU_a / U_a) \times 100}$$

## 2.8 Definition of Urban Area

Undertaking research on urbanization in the world and in particular in less developed countries presents major challenges. The most fundamental problem is that there is no global standard for the classification of urban environments. Virtually all countries distinguish between urban and rural population, but the definition of what constitutes an urban area varies among countries and in some cases it even varies over time within a single country. The case is similar for Bangladesh too.

***The definition of urban area adopted in 1981 census:***

The term urban area will normally include places having municipality/paurashava, a town committee/shahar committee or a cantonment board. In general an urban area will be a concentration of at least 5000 persons in continuous collection of houses where the community sense is well developed and the community maintains public utilities, such as roads, street lightings, water supply, sanitary arrangement, etc. An area which maintains urban characteristics but has a population of less than 5000 may be treated as other urban area as special cases. All thana headquarters irrespective of their area, population and level of urbanization will be treated as urban area though they may not come under the purview of the above definition. Moreover, some growth centers like places of trade and commercial importance, hats/bazars were also treated as urban.

***The definition of urban area adopted in 1991 census:***

In 1991 census the census authority modified the above definition and widened its purview The definition of urban area that was adopted in 1991 is as follows:

a) All places with city corporation, municipality or town committee and cantonment area, thana headquarters, industrial areas or development centers and notified towns having distinctly urban characteristics such as railway, tourists, administrative, educational and big market centers.
b) All other places which satisfy the following criteria:
    i) Majority of male working population engaged in non-agricultural pursuits.
    ii) An identifiable central place where amenities like roads, electricity, community centers, water supply, sanitation, sewerage system etc. exist and which are densely populated.

Apart from these, the outgrowths of cities and towns have also been treated as urban or an urban agglomeration. An urban agglomeration forms a town and its adjoining urban outgrowths or two or more physically contiguous towns together with contiguous well-recognized outgrowths, if any, of such towns.

As the Urban Area Report for 2001 census yet not published, so the definition of urban area adopted in 2001 census can not be mentioned here.

However, the definition of urban area adopted in 1991 census of Bangladesh provides no numerical figure regarding density of population, total population and share of working population to be engaged in non-agricultural pursuits of an urban area. Indeed, a comparative definition of urban area should incorporate population size, density and the proportion of working population engaged in non-agricultural activities.

## 2.9 Region Delineation

Defining the regions the study area Bangladesh has been divided according to formal administrative delineation. To measure the regional level of urbanization, Bangladesh has been delineated into twenty regions according to the former districts (before1981 census). Thus the greater districts are considered as regions. Table 2.2 shows the delineation of regions and the current districts which were belonging to old ones.

Table2.2: Relationship between region (Former district) and present administrative districts

| Serial No. | Former District/ Region | Present Administrative Districts |
|---|---|---|
| | **Barisal Division** | |
| 1 | Barisal | Barisal, Bhola, Jhalakati, Pirojpur |
| 2 | Patuakhali | Barguna, Patuakhali |
| | **Chittagong Division** | |
| 3 | Chittagong | Chittagong, Cox's Bazar |
| 4 | Ctg. Hill Tracts | Bandarban, Khagrachari, Rangamati |
| 5 | Comilla | Brahmanbaria, Chandpur, Comilla |
| 6 | Noakhali | Feni, Lakshmipur, Noakhali |
| | **Sylhet Division** | |
| 7 | Sylhet | Hobiganj, Moulavibazar, Sunamganj, Sylhet |
| | **Dhaka Division** | |
| 8 | Dhaka | Dhaka, Gazipur, Manikganj, Munshiganj, Narayanganj, Narsingdi |
| 9 | Faridpur | Faridpur, Rajbari, Gopalganj, Madaripur, Shariatpur |
| 10 | Jamalpur | Jamalpur, Sherpur |
| 11 | Mymensingh | Kishoreganj, Mymensingh, Netrokona |
| 12 | Tangail | Tangail |
| | **Khulna Division** | |
| 13 | Jessore | Jessore, Jhenaidah, Magura, Narail |
| 14 | Khulna | Bagerhat, Khulna, Satkhira |
| 15 | Kushtia | Chuadanga, Kushtia, Meherpur |

| Serial No. | Former District/ Region | Present Administrative Districts |
|---|---|---|
| | **Rajshahi Division** | |
| 16 | Bogra | Bogra, Joypurhat |
| 17 | Dinajpur | Dinajpur. Panchagarh, Thakurgaon |
| 18 | Pabna | Pabna, Sirajganj |
| 19 | Rajshahi | Naogaon, Natore, Nawabganj, Rajshahi |
| 20 | Rangpur | Gaibandha, Kurigram, Lalmonirhat, Nilphamari, Rangpur |

### 2.10 Description of the Factors

According to Laskar (1983) some large cities developed their infrastructure from colonial era and investment tended to be concentrated to those places because of the facilities of markets, labours, transports, services, financial institutions and other utilities. In Bangladesh urbanization at regional level is affected by some socio-economic and infrastructural factors. In this study for analysis of the regional variation of urbanization nine variables (with availability of data) from different socio-economic and infrastructural factors viz. Rural-urban migration (RUM), Percentage of urban Land (PUL), Level of industrialization (LOIND), Percentage of non-agricultural activities (NAA), Literacy rate (LITER), Length of Paved Road (RDLEN), Electricity coverage (ELEC), Water supply coverage (WS) and Sanitation coverage (SANI) has been taken into account. These variables are discussed below with the rational of selecting those:

#### 2.10.1 Rural-Urban Migration

Migration has been defined as the movement of persons who changes his/her place of residence or intend to settle in the place of enumeration area which is different from the previous place of residence for at least 6 months. There is no time limit for the migrant who changes their place of residence for marriage. According to the population census 1991, the total urban immigration rate was 56.16% where rural to urban migration rate was 51.80% (BBS 1997, p.10). For this research only rural to urban internal migration (excluding immigration) by place of birth is taken into account. The data on migration rate considered for 1991 census is given in Appendix D

There is a lot of migration from rural areas to urban areas in less developed countries. Some of the reasons are as follows:

*Rural Push Factors*

- more poverty
- less work opportunities
- limited education opportunities
- fewer medical facilities

*Urban Pull Factors*

- possibilities of jobs
- better education
- better medical
- more available/affordable housing

Migration generally tends to be a highly selective process which results in differentials in some characteristics of the migrant population from the non-migrant population both at the place of origin and at destination. Each of the characteristics, such as sex, education, marital/status, occupation, skill and socio-economic status has impact on urbanization process. The role of migration in urbanization is obvious in all societies and at almost all times, since rural-urban migration is one of the important components of urbanization. In a condition of developing urbanization, role of migration is even more pronounced while in the state of advanced urbanization, where urban growth is almost stagnant or even declining, internal migration plays a minor or almost no role.

### 2.10.2 Percentage of Urban Land

It is the ratio of the total urban area to the total area of a specific region or country which is expressed in percentage. In Bangladesh, from 1981 to 1991, percentage of urban land increased rapidly from 3.59% to 6.49%. Again in 2001, it became 7.43%. This is due to territorial expansion of urban areas and redefinition of urban areas from census to census. This annexation certainly had converted a large number of rural populations to urban population and thus it is another significant reason behind the increasing rate of urbanization in Bangladesh. It is obvious that in a region where the percentage of urban land is high urbanization will be high in that region.

### 2.10.3 Level of Industrialization

According to Rouf (1999) *"The positive association of urbanization with industrialization and economic growth are well known in today's world. It is generally believed that urbanization is associated with the degree of industrialization."* Thus level of industrialization is an important indicator of urbanization. Furthermore, Chaudhury (1980) also included industrialization as a factor affecting regional variation of urbanization.

It can be expressed as the percentage share of employment activities of economically active population of a region in the industrial sector, i.e.

$$\text{Level of Industrialization} = \frac{\text{Employment in industrial sector}}{\text{Total employment in a region}} \times 100$$

Level of industrialization in Bangladesh was 4.26% in 1981 census and in 1991 census it decreased to 3.33% and again in 2001 census it slightly increased to 3.44%. For this research the percentage of employment activities of total population aged 10 years and over of a region in the industrial sector has been utilized.

### 2.10.4 Percentage of Non-agricultural Activities

It is the percentage share of employment activities of economically active population of a region in all the sectors except agricultural sector. This study includes all population age 10 years and over who are engaged in non-agricultural activities. These activities include population engaged in industry, water/gas/electricity, construction, transport and communication, hotel and restaurant, service, business and other sectors. In Bangladesh the non-agricultural activity is 38.73% in 1981 census which increased to 45.35% in 1991 and in 2001 census it further increased to 47.38%.

Chaudhury (1980) included some selected economic characteristics by region. Among those employment activities of economically active persons was one. In this study non-agricultural activity of economically active persons is included on the ground that in the definition urban area it is mentioned *"These places are generally centers of trade and commerce with a population substantially non-agricultural and having non-agricultural labour concentration and……"* (BBS,1987). Therefore, non-agricultural activity is an

important characteristic feature of urban area and consequently it is an important indicator of urbanization.

### 2.10.5 Literacy Rate

In Bangladesh the definition of literacy has been changed from census to census. In 1981 census, a person of age 5 years and above was considered as literate if he or she could write a letter in any language. But in 1991 census, literacy rate has been defined as the percentage of persons aged 7 years and above who is able to write a letter. In Bangladesh literacy rate increases from census to census. In 1981 census it was 26.0 percent, 32.4 percent in 1991 census and increased to 46.2 percent in 2001 census.

Chaudhury (1980) incorporated literacy rate as a factor affecting regional variations in urbanization. In defining urban areas it is mentioned *"These places are generally centers of …… and high literacy rate"* (BBS, 1987). Besides it is very general contemplation that in urban areas literacy rate is high. Therefore, high literacy rate is an important indicator of urbanization

### 2.10.6 Road Length

Rapid and expanded urbanization occurring around the world involves an increased numbers of trips in urban areas. Cities have traditionally responded to growth in mobility by expanding the transportation supply, by building new highways and/or transit lines.

This study included the total amount of paved road (in km.) available in each regions of Bangladesh. It has taken into account the national highway, regional highway and feeder roads under Roads and Highways Department.

It is assumed in this study that infrastructural facilities especially road network promotes urbanization. In general an urban area will be a concentration of at least 5000 persons in continuous collection of houses where the community sense is well developed and the community maintains public utilities, such as roads, ……(BBS.1987).

Again, in defining the criteria of urban area it is mentioned that an identifiable central place where amenities like roads. …… etc. exist (BBS,1997).

### 2.10.7 Electricity Coverage

It is expressed as the percentage of dwelling households in a region having electricity connection. The electricity coverage in Bangladesh increased from census to census. In 1981 census there was no data for electricity coverage, but it was mentioned that the urban areas of the district were provided with electricity. In 1991 census electricity coverage in Bangladesh was 14.30 % and in 2001 census it increased to 31.91%.

Chaudhury (1980) included electricity supply coverage as an indicator of urbanization in his study. In defining urban area it is mentioned that an identifiable central place where amenities like roads, electricity, ..... etc. exist (BBS, 1997). It is a general idea that the electricity coverage is high in urban areas than rural areas in Bangladesh so it is obvious that in those regions with high electricity coverage the urbanization will be also high.

### 2.10.8 Water Supply Coverage

It is expressed as the percentage of dwelling households in a region having supplied water. For this study only those households having tap water facility is considered. In Bangladesh tap water supply coverage was 3.75% in 1981 census. According to the population census1991, only 4.3% households of the country have tap water facility and in the urban areas this rate is 22.48%. In 2001 the percentage of household having tap water facility increased to 6.18%.

An identifiable central place where amenities like roads, electricity, community centers, water supply, ..... etc. exist (BBS, 1997). It is a very common view in Bangladesh that the more the piped water supply coverage in a region the higher the urbanization in that region.

### 2.10.9 Sanitation Coverage

It is expressed as the percentage of dwelling households in a region having sanitary toilet facility. There was no data for sanitation coverage in 1981 census Again in 1991 census it was only 13.12% which increased to 37.42 % in 2001.

In BBS (1997) in defining the criteria of urban area it was mentioned that an identifiable central place where amenities like roads, electricity, community centers, water supply,

sanitation, ..... .....etc. exist. Thus sanitation coverage is used in this study as an indicator of urbanization.

## 2.11 Quantitative Techniques Used

The statistical tools are applied in this research are:

### 2.11.1 Location Quotient (L.Q.)

The location quotient is most frequently used in economic geography and locational analysis, but it has much wider applicability. The location quotient (L.Q ) is an index for comparing an area's share of a particular activity/ phenomenon with the area's share of some basic or aggregate phenomenon. The advantages of the location quotient method are its simplicity and the fact that it can be based on readily available data.

In the early 1940's the U.S National Resource Board computed for every state its location quotient with respect to each manufacturing activity. Pasha (1991) used the location quotient as an indicator of inter-ward disparity in Dhaka city. It measured the extent to which the socio-economic facilities of various wards of the city are in balance. It was used as a device for comparing a ward's percentage share of a particular facility with its percentage share of some basic aggregate. Again Mazumder and Tamima (2006) applied location quotient as an indicator of inter-ward disparity in regard of distribution of various socio-economic facilities in Rajshahi Metropolitan Area.

Location quotient is employed here as a bench mark in the analysis of the concentration or deconcentration of the urban population in different regions of Bangladesh. Here it is used as a ratio of percentage of urban population in a region to the percentage of national urban population. It can be expressed as-

$$\text{L.Q. of region 'X'} = \frac{\text{\% of urban population in region 'X'}}{\text{\% of urban population in Bangladesh}}$$

For example in 1991 the urban population at Rajshahi region was 17.08 percent and percentage of urban population in Bangladesh was 19.71. So in 1991 the L.Q. of Rajshahi region was 0.8664.

### 2.11.2 Gini Index

The Gini Index was first employed by the Italian statistician Corrado Gini in 1982. This is based on a curve fitted to percentile shares, which was developed by Lorenz in 1905 named after him Lorenz curve (Pasha, 1991).

The Gini index is the Gini coefficient expressed as a percentage, and is equal to the Gini coefficient multiplied by 100.

The Gini coefficient is a measure of inequality of a distribution of a variable (income/wealth/population etc.). It is defined as a ratio with values between 0 and 1: the numerator is the area between the Lorenz curve of the distribution and the uniform (perfect) distribution line; the denominator is the area under the uniform distribution line.

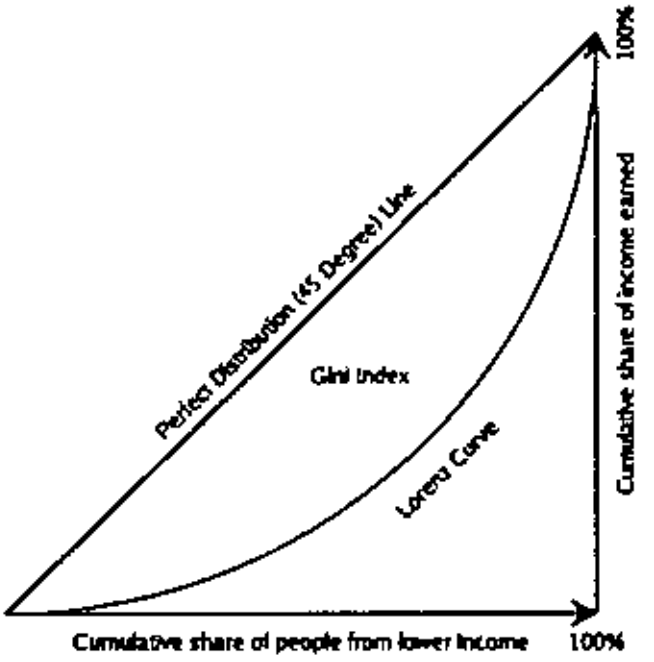



Figure 2.1: Graphical representation of the Gini coefficient

Pasha (1991) employed Gini Index to find out the disparity of various facilities that existed among the different wards of Dhaka city. It is a single measure of relative inequality in terms of the socio-economic facilities available and is useful in studies of the distribution of the socio-economic facilities among the wards (Pasha, 1991).

It is used in this study as a population (urban) inequality metric. The coefficient value ranges from o to 1 where 0 corresponds to perfect population equality (i.e. every region has the same urban population) and 1 corresponds to perfect population inequality (i.e one region has all the urban population, while every region else has zero population).

In a **Lorenz curve**, a measure of the difference between a given distribution of a variable, like population or income, and a perfectly even distribution. More simply, it tells us how evenly the variable is spread; this might be a measure of how urban population is distributed over the regions of a country. It is formed by plotting the cumulative distribution of the amount of the variable concerned against the cumulative frequency distribution of the individuals possessing the amount. The Gini coefficient is defined as a ratio of the areas on the Lorenz curve diagram. If the area between the line of perfect equality and Lorenz curve is A, and the area under the Lorenz curve is B, then the Gini coefficient is A/(A+B). In Figure 2.1 the diagonal line shows an even/perfect distribution, and the calculation of the Gini coefficient uses the 'gap' between the diagonal and the actual (Lorenz) curve. The lower the Gini coefficient, the more evenly spread the variable.

### 2.11.3 Pearson's correlation (r)

It is concerned with the analysis of two variables at a time in order to uncover whether the two variables are related. In this study this method is used for Bivariate Regression Analysis. Pearson's r is a method for examining relationships between two variables. The main features of this method are as follows (Bryman, 2001):

- the coefficient will almost certainly lie between 0 (zero or no relationship between the two variables) and 1 (a perfect relationship)- this indicates the *strength* of a relationship;
- the closer the coefficient is to 1, the stronger the relationship; the closer it is to zero, the weaker the relationship;
- the coefficient will be either positive or negative - this indicates the *direction* of a relationship.

# CHAPTER 3

# TREND OF URBANIZATION IN BANGLADESH

## 3.1 Introduction

Urbanization is one of the most significant developmental issues in Bangladesh. While developing nations in Asia show rapid rate of urbanization, Bangladesh still remains less urbanized. although the absolute urban population as well as the number of cities and towns in the country has increased manifold during the last few decades (Islam, 1996). Both the process of urbanization and the dynamics of growth of urban centers in Bangladesh are quite different from other developing countries in South and Southeast Asia.

In the 18th century when the British East India Company assumed power. there were few urban settlements in this region. Only Dhaka enjoyed some prominence for a short time period after it was declared as a provincial capital by the Mughals in 1610. Outside Dhaka, urbanization in elementary form began to set in as a network of administrative and trade centers during the latter half of British colonial rule. With the departure of the British in 1947 the region that is now Bangladesh became a part of Pakistan. However the country experienced rather urbanization since 1951 and the graph of urbanization within Bangladesh took an upward course

After the inception of Bangladesh in 1971, this graph began to traverse an even steeper trajectory. This sharp acceleration of urban population growth may be attributed to some industrial development in 1960s and the emergence of Bangladesh as a sovereign nation. The first population census of independent Bangladesh 1974 represents the highest ever intercensal variation (137.57 percent) and annual average growth rate (9.04 percent) in urban population. At the turn of the new millennium, urbanization in Bangladesh has continued to grow ever since, but at a lower rate Much of the urbanization has been concentrated in Dhaka District which is 61.30 percent urbanized, compared to 43.57 percent in the second most urbanized district, Chittagong.

In this chapter the trend of urbanization in Bangladesh will be analyzed for the period 1981-2001. Here trend will be studied at three levels - national, divisional and regional level. Moreover, some facts and events that happened before this specified time period will be discussed to link the past with the present. It will also discuss several aspects of urbanization

i.e. percentage of urban land (PUL), urban population density (UPD), share of national urban population (SNUP) and share of national urban land (SNUL) in different spatial and temporal perspectives.

### 3.2 National Trend of Urbanization in Bangladesh (1981-2001)

After 1974 the proportion of urban population increased predominantly due to the flexibility of the definition of 'urban area' and rural-urban migration. About 30 percent of the total increase in urban population during 1974-1981 could be explained by the extended definition of urban area in 1981(Rouf, 1999, p. 30). Table 3.1 shows that a steady growth in the percentage of urban population was registered in each decade since 1981. Again the intercensal variation of urban population is also high but the percentage of variation is decreasing from 53.90% in 1991 to 40.17% in 2001.

Table 3.1: Intercensal Growth Rate of Urban Population (1981-2001)

| Census Year | Urban Population | | Intercensal Variation | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| 1981 | 13562504 | 15.50 | - | - |
| 1991 | 20872174 | 19 71 | 7309670 | 53.90 |
| 2001 | 29256592 | 23.53 | 8384418 | 40.17 |

Source: Population Census 1981, 1991 and 2001

From Table 3.2 it is revealed that annual average growth rate of urban population is much greater than that of the total population. From Table 3.1 and Table 3.2 it is seen that in 1991 the country had over 20.8 million urban population with 19.71 percent level of urbanization accompanied by 53.90 percent intercensal increase and annual average growth rate of 4.31. In case of 2001 census the percentage of intercensal variation and annual average growth rate of urban population are respectively 40.17 percent and 3.38 which are less than that of 1991. Although in 2001 the number of total urban population (29.25 million) and level of urbanization (23.53%) were higher than that of 1981 and 1991, it implies that urbanization in Bangladesh is increasing but at a decreasing rate since 1981.

Table 3.2: Growth Rate of National and Urban Population and Levels of Urbanization in Bangladesh (1981-2001)

| Census Year | Population | | Intercensal Variation | | Annual Av. Growth Rate* (%) | | Level of Urbaniza-tion (%) |
|---|---|---|---|---|---|---|---|
| | Total | Urban | Total | Urban | National | Urban | |
| 1981 | 87528062 | 13562504 | - | - | - | - | 15.50 |
| 1991 | 105903609 | 20872174 | 18375547 | 7309670 | 1.91 | 4.31 | 19.71 |
| 2001 | 124355263 | 29256592 | 18451654 | 8384418 | 1.61 | 3.38 | 23.53 |

* Exponential Growth Rate. Source: Calculated from Population Census 1981, 1991 and 2001

In Figure 3.1 below the trend line depicts the rising trend of level of urbanization in Bangladesh since 1974. It shows that during 1981-1991 the level of urbanization increased steadily but it increased with a lower gradient during 1991-2001.

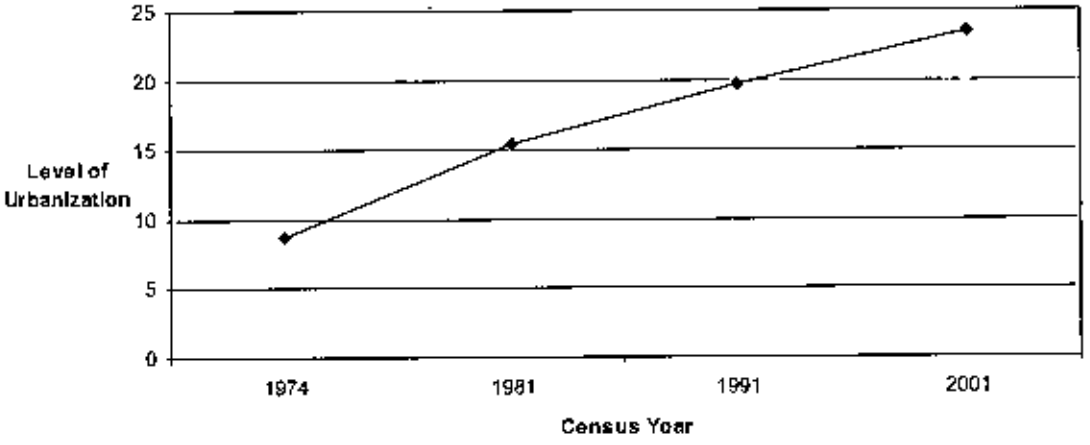



Figure 3.1: Trend of Urbanization in Bangladesh (1974-2001)

Table 3.3 reveals the increasing percentage of urban land from census to census. It is observed from this Table that in 1981 census the amount of urban land was 3.59 percent. In the next census 1991 this amount rapidly increased to 6.49 percent which in 2001 census became to 7.41 percent. The cause is that in Bangladesh the definition of urban area has been changed from census to census, therefore inclusion of rural areas as urban in new census.

Table 3.3: Percentage of Urban Land in Bangladesh (1981-2001)

| Census Year | Total Land (sq. km) | Urban Land (sq.km) | Percentage of Urban Land |
|---|---|---|---|
| 1981 | 147571 | 5302.56 | 3.59 |
| 1991 | 147571 | 9576.90 | 6.49 |
| 2001 | 147571 | 10928.35 | 7.41 |

### 3.3 Divisional Trend of Urbanization (1981-2001)

Up to 1991 census there were four divisions in Bangladesh namely Dhaka, Chittagong Rajshashi and Khulna. Later two new divisions namely Barisal and Sylhet are declared dividing the former divisions Khulna and Chittagong repectively. From Table 3.4 it is found that Dhaka is the highest urbanized division in Bangladesh all along. All along Dhaka was followed by Chittagong and Khulna division occupying 2nd and 3rd position respectively. Sylhet division became the lowest urbanized division all over the period during 1981-2001. From 1991 to 2001 the divisional rank of urbanization in Bangladesh remained unchanged with descending order as Dhaka, Chittagong, Khulna, Rajshahi, Barisal and Sylhet.

Figure 3.2 shows the trend of urbanization by new divisions from 1981 to 2001. It shows an upward trend of urbanization in all the divisions in Bangladesh from census to census. The level of urbanization in Dhaka is the highest compared to other divisions in all three censuses at higher gradient. Chittagong division followed Dhaka where the rate of increase is also high. The other divisions – Khulna, Rajshahi, Barisal and Sylhet also took upward course but with a lower grade. One distinct feature is also observable from this Figure that is the relative change in level of urbanization between Barisal and Rajshahi division. After 1981 the level of urbanization of Rajshahi division improved with a higher rate than that of Barisal and thus Rajshahi division crossed the level of urbanization of Barisal division.

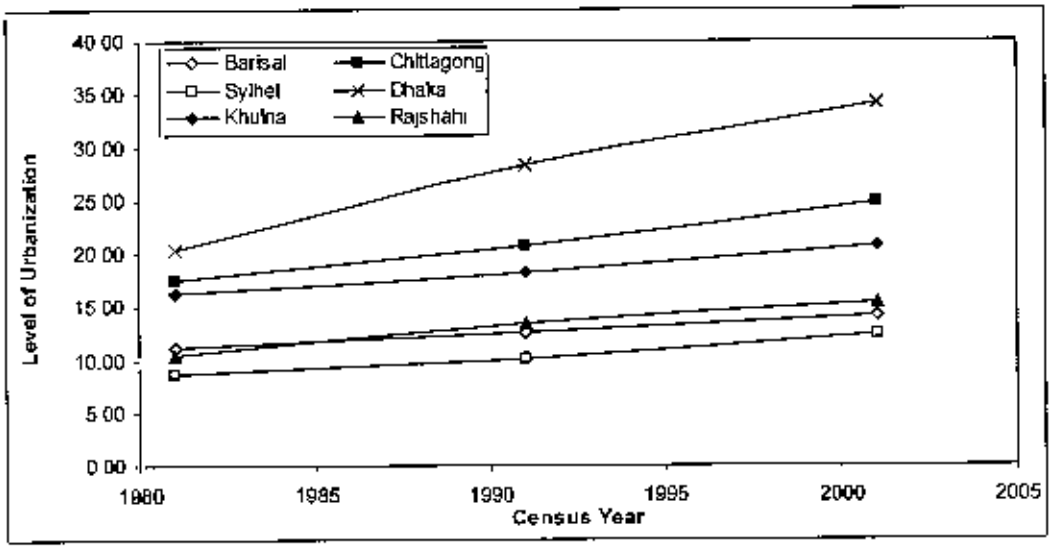



Figure 3.2: Trend of Urbanization by Division (1981-2001)

Table 3.4: Division-wise Level of Urbanization and its Ranking (1981-2001)

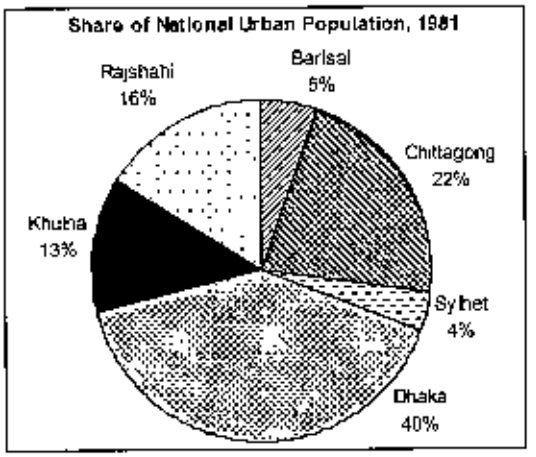
| Division | 1981 | | | 1991 | | | 2001 | | | Division-wise Ranking of Level of Urbz$^n$ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Pop$^n$ | Urban Pop$^n$ | Level of Urbz$^n$ | Total Pop$^n$ | Urban Pop$^n$ | Level of Urbz$^n$ | Total Pop$^n$ | Urban Pop$^n$ | Level of Urbz$^n$ | 1981 | 1991 | 2001 |
| Barisal | 6509581 | 730086 | 11.22 | 7462643 | 935352 | 12.53 | 8173718 | 1162775 | 14.23 | 4th | 5th | 5th |
| Chittagong | 16940044 | 2969804 | 17.53 | 20522459 | 4245656 | 20.69 | 24290384 | 6022650 | 24.79 | 2nd | 2nd | 2nd |
| Sylhet | 5655543 | 493060 | 8.72 | 6765039 | 681759 | 10.08 | 7939343 | 987538 | 12.44 | 6th | 6th | 6th |
| Dhaka | 26649397 | 5433803 | 20.39 | 32255041 | 9137817 | 28.33 | 39044716 | 13364520 | 34.23 | 1st | 1st | 1st |
| Khulna | 10641304 | 1737369 | 16.33 | 12688383 | 2323789 | 18.31 | 14705229 | 3042664 | 20.69 | 3rd | 3rd | 3rd |
| Rajshahi | 21132193 | 2198382 | 10.40 | 26210044 | 3547801 | 13.54 | 30201873 | 4676445 | 15.48 | 5th | 4th | 4th |

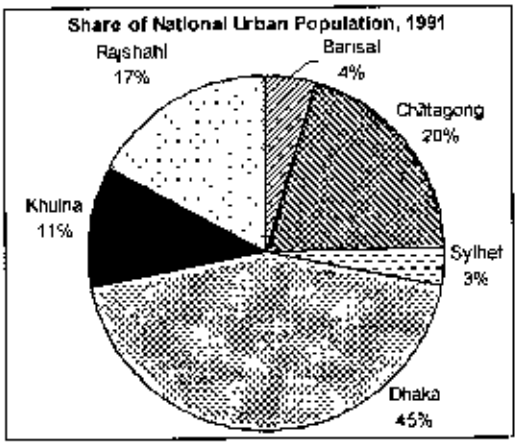
Source. Calculated from Appendix A

### 3.3.1 Share of National Urban Population by Divisions (1981-2001)

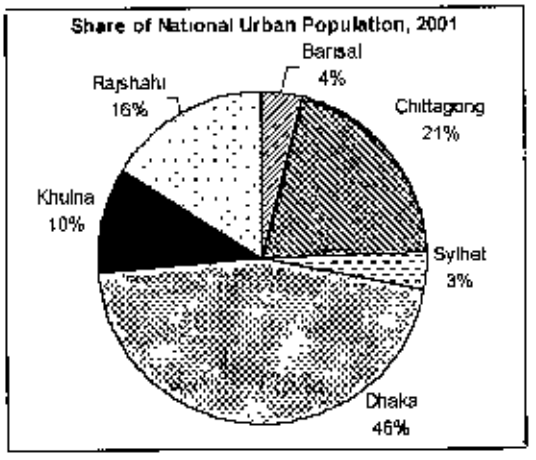
In Figure 3.3 the division-wise Share of National Urban Population (SNUP) for 1981, 1991 and 2001 census has been given away.

Figure 3.3: Share of National Urban Population by Divisions for 1981, 1991 and 2001



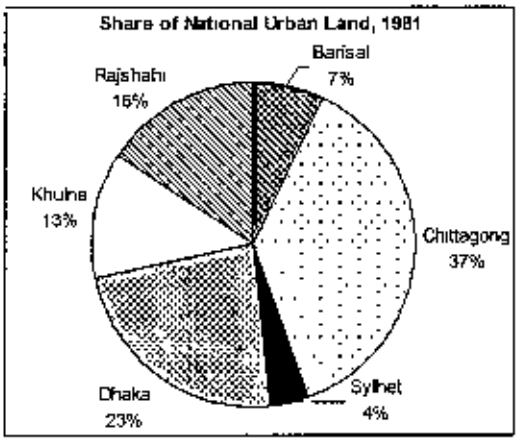

From figure 3.3 it is observed that there has been no change in the position/rank of the divisions in terms of SNUP. But the percentage share varied during 1981 to 2001. Hence it is observed that Dhaka division overwhelmingly holds the highest percentage of urban population in all the census years. On the other hand, Sylhet division holds the lowest for that of the same case. Share of national urban population is seen increasing in Dhaka division and for others it remained unchanged or decreased slightly except Khulna where the share declined from one decade to another.

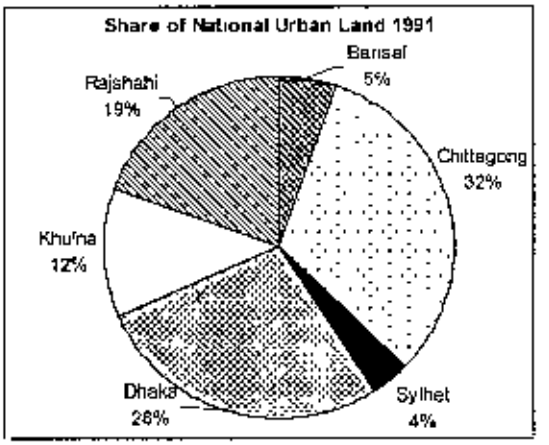



### 3.3.2 Share of National Urban Land by Divisions (1981-2001)

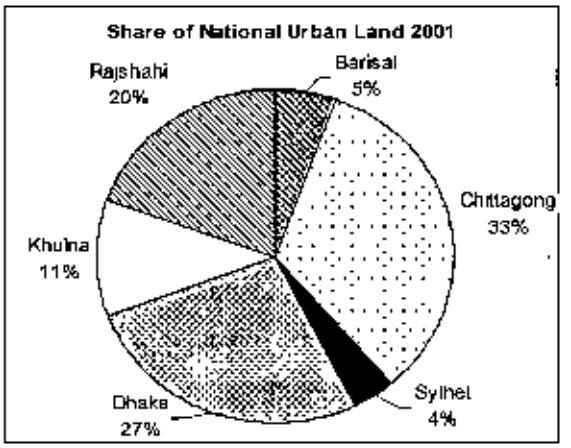
Figure 3.4 provides the share of national urban land (SNUL) for each six divisions in 1981, 1991 and 2001. There has been no change in the position/rank of the divisions in terms of SNUL. But there percentage share varied from one decade to another.

Figure 3.4: Share of National Urban Land by Divisions for 1981, 1991 and 2001




It is observed from this figure that Chittagong division overwhelmingly holds the highest percentage of urban land in all the census years although its share is decreasing from census to census. On the other hand, Sylhet division holds the lowest for the previous mentioned case. Share of national urban land is seen increasing in Dhaka and Rajshahi division and for others it




remained unchanged or decreased slightly except Khulna where the share has been declined from census to census.

### 3.4 Regional Trend of Urbanization (1981-2001)

Table 3.5 reveals the level of urbanization for each twenty regions and their ranks in the census years of 1981, 1991 and 2001. It is observed from this Table that the level of urbanization for almost all the regions increased rapidly from one decade to another. Dhaka region emerged as the highest urbanized region in the last three consecutive censuses where the capital city of Bangladesh - Dhaka is situated. Dhaka was followed by Chittagong, Hill Tracts and Khulna region during 1981-2001 in descending order of their positions. In 1981 Kushtia region held the 5$^{th}$ position but it declined its rank to 6$^{th}$ position both in the census 1991 and 2001. The rank position of Rajshahi region was 11$^{th}$ in 1981 which improved its position in 1991 placing itself in the 5$^{th}$ place and hold continued this position up to 2001.

Table 3.5: Region-wise Level of Urbanization and their Ranks (1981-2001)

| Regions | 1981 | | | | 1991 | | | | 2001 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Pop* | Urban Pop* | Level of Urbaniz* | Rank | Total Pop* | Urban Pop* | Level of Urbaniz* | Rank | Total Pop* | Urban Pop* | Level of Urbaniz* | Rank |
| Dhaka | 10013733 | 3899702 | 38.94 | 1st | 13232427 | 7137518 | 53.94 | 1st | 17192103 | 10539327 | 61.30 | 1st |
| Mymensingh | 6979400 | 717576 | 10.28 | 12th | 7583270 | 929531 | 12.26 | 10th | 9072868 | 1205111 | 13.28 | 14th |
| Jamalpur | 2451719 | 223160 | 9.10 | 13th | 3013069 | 320590 | 10.64 | 15th | 3386751 | 467435 | 13.80 | 12th |
| Tangail | 2442607 | 184781 | 7.56 | 19th | 3002428 | 281542 | 9.38 | 19th | 3290696 | 438011 | 13.31 | 13th |
| Faridpur | 4761938 | 408584 | 8.58 | 17th | 5423847 | 468636 | 8.64 | 20th | 6102298 | 714636 | 11.71 | 19th |
| Chittagong | 5491330 | 1761779 | 32.08 | 2nd | 6715387 | 2599031 | 38.72 | 2nd | 8385849 | 3654118 | 43.57 | 2nd |
| Hill-Tracts | 751692 | 216512 | 28.80 | 3rd | 974445 | 324315 | 33.28 | 3rd | 1331966 | 433989 | 32.58 | 3rd |
| Comilla | 6881002 | 585703 | 8.51 | 18th | 8206860 | 811868 | 9.89 | 17th | 9265040 | 1185575 | 12.80 | 16th |
| Noakhali | 3816020 | 429891 | 11.27 | 9th | 4625767 | 509542 | 11.02 | 13th | 5307529 | 748968 | 14.11 | 11th |
| Sylhet | 5655543 | 493060 | 8.72 | 16th | 6765039 | 681759 | 10.08 | 16th | 7939343 | 987538 | 12.44 | 17th |
| Khulna | 4329314 | 974314 | 22.51 | 4th | 5039153 | 1328654 | 26.37 | 4th | 5792706 | 1662376 | 28.70 | 4th |
| Jessore | 4019993 | 440729 | 10.96 | 10th | 4848023 | 575254 | 11.87 | 11th | 5573802 | 822375 | 14.75 | 9th |
| Kushtia | 2291997 | 322326 | 14.06 | 5th | 2801207 | 419881 | 14.99 | 6th | 3338721 | 557913 | 16.71 | 6th |
| Barisal | 4666734 | 564840 | 12.10 | 6th | 5413078 | 735734 | 13.59 | 8th | 5864383 | 899909 | 15.35 | 8th |
| Patuakhali | 1842847 | 165246 | 8.97 | 14th | 2049565 | 199618 | 9.74 | 18th | 2309335 | 262866 | 11.38 | 20th |
| Rajshahi | 5270141 | 571666 | 10.85 | 11th | 6594298 | 1126013 | 17.08 | 5th | 7624887 | 1527114 | 20.03 | 5th |
| Pabna | 3423704 | 404520 | 11.82 | 7th | 4183469 | 592172 | 14.16 | 7th | 4870084 | 770643 | 15.82 | 7th |
| Bogra | 2727973 | 203009 | 7.44 | 20th | 3434298 | 374169 | 10.90 | 14th | 3859752 | 510374 | 13.22 | 15th |
| Rangpur | 6510050 | 735455 | 11.30 | 8th | 8014876 | 1014107 | 12.65 | 9th | 9153728 | 1307612 | 14.29 | 10th |
| Dinajpur | 3200325 | 283732 | 8.87 | 15th | 3983103 | 441340 | 11.08 | 12th | 4693422 | 560702 | 11.95 | 18th |

Source: Calculated from Appendix A

Interestingly Pabna region hold the 7th position all through the three decades and Rangpur declined its position by 1 rank order from 8th in 1981 to 9th in 1991 and to 10th in 2001. During 1981-1991, Noakhali region degraded from 9th to 13th rank position. Some regions such as Dinajpur, Bogra, Mymensingh also improved their positions significantly from the census year 1981 to 1991. The highest degree of variation in the level of urbanization observed in Tangail region; while it improved its position from the rank of 19th to 13th during 1991 to 2001 census. Another variation was found in Dinajpur region for it's degradation from 12th rank to 18th in the inter-census period 1991-2001. The lowest urbanized region with rank of 20th was Bogra, Faridpur and Patuakhali in 1981, 1991 and 2001 correspondingly. Other regions with low level of urbanization during the period 1981-2001 were Comilla and Sylhet. Again for the same time period the higher level of urbanization was observed in Dhaka, Chittagong, Hill-Tracts, Khulna, Kushtia, Barisal and Pabna region. Another remarkable observation is that the ranks of Dhaka, Chittagong, Hill Tracts, Khulna and Pabna region remained unchanged in the last three decades. Figure 3.5 provides a vivid picture of regional variation in level of urbanization for the census 1981, 1991 and 2001.

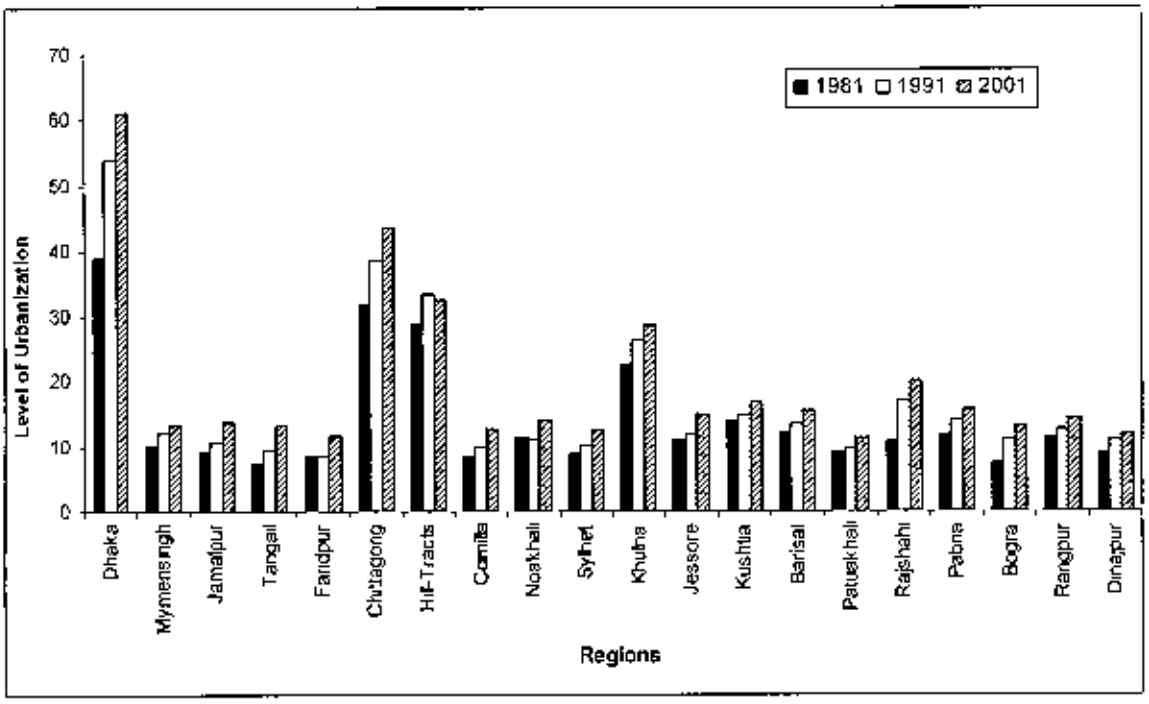



Figure 3.5: Regional Trend of Urbanization in Bangladesh (1981-2001)

### 3.4.1 Urban Population Density (UPD) and Share of National Urban Population (SNUP) by Regions (1981-2001)

With the variation in level of urbanization the share of national urban population and urban population density also varies from census to census among the regions in Bangladesh. Urban population density (UPD) increases not only for natural growth but also for rural-urban migration. Table 3.6 shows that in all the regions the density of urban population increased very rapidly. Dhaka has the highest density with 1st rank position since 1981 which is followed by Chittagong with the 2nd rank. The density of urban population in Dhaka region was 524.15 per sq. km in 1981 which rose to 959.34 per sq. km in 1991 and in 2001 it became 1416.58 per sq. km. The density of urban population is the lowest in Hill Tracts region with 20th rank position in all of the three censuses because of its vast urban land (Table 3.7) and low urban population (Table 3.5). Similar to Dhaka, Chittagong and Hill Tracts in some other regions viz. Sylhet, Patuakhali and Dinajpur though the density of urban population increased but their rank positions remained unchanged during 1981-2001. Again in Rajshahi region the urban population density and its rank increased very rapidly from 1981 with rank position 13th to 6th in 1991 and to 4th in 2001. Similar to Rajshahi in Jamalpur the rank position in respect of UPD improved during 1981-2001 successively from census to census. Following Dhaka and Chittagong regions the density of urban population is higher in comilla, Kushtia, Khulna and Pabna regions with slightly fluctuating rank positions from 3th to 7th during the same period. In some other regions though the density of urban population increased but their rank positions declined successively from census to census e.g. Mymensingh, Barisal and Rangpur. Again the share of national urban population is changing in the regions with the increase in urban population. Among the twenty regions, the share of national urban population (SNUP) is highest in Dhaka region having 28.70% in 1981, 34.20% in 1991 and 36.02% in 2001. Except Dhaka SNUP is higher in Chittagong with rank position 2nd and Khulna with rank 3rd all along. In 1981 the rank of Rajshahi region was 7th but it improved its position to 4th rank and held this position both in 1991 and 2001. Among the other regions Rangpur, Mymensingh, Comilla, Sylhet and Barisal regions held the higher share of urban population. Share of urban population is lowest in Jamalpur, Tangail. Hill-Tracts, Patuakhali and Bogra regions during 1981-2001.

Table 3.6: Urban Population Density (UPD) and Share of National Urban Population (SNUP) by Regions (1981-2001)

| Regions | UPD (pop"/sq. km) | | | Rank of UPD | | | SNUP | | | Rank of SNUP | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1981 | 1991 | 2001 | 1981 | 1991 | 2001 | 1981 | 1991 | 2001 | 1981 | 1991 | 2001 |
| Dhaka | 524.15 | 959.34 | 1416.58 | 1 | 1 | 1 | 28.7 | 34.2 | 36.02 | 1 | 1 | 1 |
| Chittagong | 226.6 | 334.4 | 469.98 | 2 | 2 | 2 | 12.97 | 12.46 | 12.49 | 2 | 2 | 2 |
| Comilla | 87.21 | 120.89 | 176.53 | 4 | 4 | 3 | 4.31 | 3.89 | 4.05 | 6 | 7 | 7 |
| Rajshahi | 60.55 | 119.26 | 161.74 | 13 | 6 | 4 | 4.21 | 5.39 | 5.22 | 7 | 4 | 4 |
| Kushtia | 92.25 | 120.17 | 159.68 | 3 | 5 | 5 | 2.37 | 2.01 | 1.91 | 14 | 15 | 15 |
| Pabna | 83.06 | 121.6 | 158.24 | 5 | 3 | 6 | 2 98 | 2.84 | 2.63 | 13 | 10 | 11 |
| Khulna | 79.79 | 108.81 | 136.14 | 6 | 7 | 7 | 7 17 | 6.37 | 5.68 | 3 | 3 | 3 |
| Jamalpur | 65.71 | 94.4 | 137.64 | 12 | 10 | 8 | 1.64 | 1.54 | 1.6 | 16 | 18 | 17 |
| Rangpur | 76.09 | 104.93 | 135 29 | 7 | 8 | 9 | 5.41 | 4.86 | 4.47 | 4 | 5 | 5 |
| Bogra | 52.25 | 96.31 | 131.37 | 16 | 9 | 10 | 1.49 | 1.79 | 1.74 | 18 | 16 | 16 |
| Tangail | 54.12 | 82.47 | 128.3 | 15 | 15 | 11 | 1.36 | 1.35 | 1.5 | 19 | 19 | 18 |
| Jessore | 67.11 | 87.6 | 125.23 | 10 | 13 | 12 | 3.24 | 2.76 | 2.81 | 10 | 11 | 10 |
| Noakhali | 71 83 | 85.14 | 125.14 | 8 | 14 | 13 | 3.16 | 2.44 | 2.56 | 11 | 12 | 12 |
| Mymensingh | 72.76 | 94.25 | 122.2 | 9 | 11 | 14 | 5.28 | 4.45 | 4.12 | 5 | 6 | 6 |
| Barisal | 68 51 | 89.23 | 109.15 | 11 | 12 | 15 | 4.16 | 3.52 | 3.08 | 8 | 8 | 9 |
| Faridpur | 58.29 | 66.86 | 101.96 | 14 | 16 | 16 | 3.01 | 2.25 | 2.44 | 12 | 13 | 13 |
| Dinajpur | 42.65 | 66.34 | 84.28 | 17 | 17 | 17 | 2.09 | 2.11 | 1.92 | 15 | 14 | 14 |
| Sylhet | 39.14 | 54.13 | 78.4 | 18 | 18 | 18 | 3.63 | 3.27 | 3.38 | 9 | 9 | 8 |
| Patuakhali | 32.71 | 39 51 | 52.03 | 19 | 19 | 19 | 1.22 | 0.96 | 0.9 | 20 | 20 | 20 |
| Hill-Tracts | 16.29 | 24.39 | 32.64 | 20 | 20 | 20 | 1.59 | 1.55 | 1.48 | 17 | 17 | 19 |

Source: Calculated from Appendix A

### 3.4.2 Percentage of Urban Land (PUL) and Share of National Urban Land (SNUL) by Regions (1981-2001)

Table 3.7 reveals the percentage of urban land (PUL) in each region and the share of national urban land (SNUL) by regions with their respective ranks during 1981-2001.

With redefinition and territorial extension of urban areas in Bangladesh the percentage of urban land is increasing in each region from census to census. It is revealed that in 1981 it was 11.19 percent in Chittagong region with the 1st rank position, whereas in 1991 and 2001 it increased to 16.16 percent and 17.73 percent respectively with the 2nd rank position in both the censuses. On the other hand in Dhaka region the amount of urban land rapidly improved from 8.47 percent in 1981 to 21.68 percent in 1991. In 2001 it further rose to 22.39 percent. Following these trends the rank positions in respect of PUL also improved for Dhaka region and in 1981 it was in 2nd position whereas both in 1991 and 2001 its rank improved to 1st position. In Hill-Tracts region the percentage of urban land was also higher (with 3rd rank positions all along) because of declaration of hilly areas into urban localities. Again Kushtia region held the 4th rank positions in all through the three censuses with increasing percentage of urban land i.e. 5.37 percent in 1981, 8.06 percent in 1991 and 9.05 pereent in 2001. A drastic change in respect of PUL occurred in Rajshahi region during 1981-1991. In 1981 the PUL in Rajshahi region was only 2.29 percent which placed it into 15th rank position whereas this rank improved to 5th position in 1991 with 7.24 percent urban land and again in 2001 this percentage further improved to 8.14 with the same rank position. In respect of PUL Barisal region is an exception where the PUL increased very slowly in the inter-census periods which placed it from 5th in 1981 to 15th rank positions in both 1991 and 2001.

In 1981 the share of national urban land (SNUL) was highest in Chittagong (16.41%); this position was occupied by Dhaka both in 1991(16.84%) and in 2001(15.19%). Both in 1991 and 2001 census regarding SNUL the 2nd and 3rd highest position was occupied by Chittagong and Hill Tracts alternatively. Bogra had the lowest SNUL in the three census years with only 1.44% in 1981, 1.31 in 1991 and 1.30 in 2001. In some regions such as Comilla, Patuakhali, Pabna and Rangpur SNUL increased both during 1981-1991 and 1991-2001 decennial periods because of expansion of urban areas in these regions.

Table 3.7: Percentage of Urban Land (PUL) and Share of National Urban Land (SNUL) by Regions (1981-2001)

| Regions | Total Land (sq.km) | 1981 | | | 1991 | | | 2001 | | | Rank of PUL | | | Rank of SNUL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Urban Land | PUL | SNUL | Urban Land | PUL | SNUL | Urban Land | PUL | SNUL | 1981 | 1991 | 2001 | 1981 | 1991 | 2001 |
| Dhaka | 7440 | 630.48 | 8.47 | 11.89 | 1613.1 | 21.68 | 16.84 | 1665.7 | 22.39 | 15.19 | 2 | 1 | 1 | 3 | 1 | 1 |
| Mymensingh | 9862 | 268.2 | 2.72 | 5.06 | 454.67 | 4.61 | 4.75 | 544.97 | 5.53 | 4.97 | 10 | 10 | 12 | 7 | 7 | 6 |
| Jamalpur | 3396 | 85.4 | 2.51 | 1.61 | 153.64 | 4.52 | 1.6 | 200.41 | 5.90 | 1.83 | 11 | 11 | 10 | 17 | 18 | 17 |
| Tangail | 3414 | 84.1 | 2.46 | 1.59 | 143.09 | 4.19 | 1.49 | 160.93 | 4.71 | 1.47 | 12 | 15 | 15 | 18 | 19 | 19 |
| Faridpur | 7009 | 159.1 | 2.27 | 3 | 277.42 | 3.96 | 2.9 | 388.83 | 5.55 | 3.55 | 16 | 16 | 11 | 13 | 13 | 11 |
| Chittagong | 7775 | 870.4 | 11.19 | 16.41 | 1256.7 | 16.16 | 13.12 | 1378.8 | 17.73 | 12.57 | 1 | 2 | 2 | 1 | 2 | 3 |
| Hill-Tracts | 13295 | 773.3 | 5.82 | 14.58 | 1201.4 | 9.04 | 12.54 | 1483.8 | 11.16 | 13.53 | 3 | 3 | 3 | 2 | 3 | 2 |
| Comilla | 6716 | 156.6 | 2.33 | 2.95 | 293.32 | 4.37 | 3.06 | 421.24 | 6.27 | 3.84 | 14 | 12 | 8 | 14 | 12 | 8 |
| Noakhali | 5985 | 188.3 | 3.15 | 3.55 | 302.12 | 5.05 | 3.15 | 329.44 | 5.50 | 3 | 6 | 9 | 13 | 10 | 11 | 13 |
| Sylhet | 12596 | 210.3 | 1.67 | 3.97 | 337.37 | 2.68 | 3.52 | 417.73 | 3.32 | 3.81 | 19 | 20 | 20 | 9 | 10 | 9 |
| Khulna | 12211 | 295.33 | 2.42 | 5.57 | 528.71 | 4.33 | 5.52 | 540.37 | 4.43 | 4.93 | 13 | 13 | 16 | 4 | 6 | 7 |
| Jessore | 6567 | 187 | 2.85 | 3.53 | 363.86 | 5.54 | 3.8 | 387.91 | 5.91 | 3.54 | 8 | 7 | 9 | 12 | 8 | 12 |
| Kushtia | 3494 | 187.6 | 5.37 | 3.54 | 281.57 | 8.06 | 2.94 | 316.05 | 9.05 | 2.88 | 4 | 4 | 4 | 11 | 14 | 15 |
| Barisal | 8245 | 291.6 | 3.54 | 5.5 | 356.19 | 4.32 | 3.72 | 407.2 | 4.94 | 3.71 | 5 | 14 | 14 | 5 | 9 | 10 |
| Patuakhali | 5052 | 76.8 | 1.52 | 1.45 | 153.08 | 3.03 | 1.6 | 192.47 | 3.81 | 1.75 | 20 | 19 | 18 | 19 | 17 | 18 |
| Rajshahi | 9442 | 215.9 | 2.29 | 4.07 | 683.27 | 7.24 | 7.13 | 769.04 | 8.14 | 7.01 | 15 | 5 | 5 | 8 | 4 | 4 |
| Pabna | 4870 | 148 | 3.04 | 2.79 | 275.39 | 5.65 | 2.88 | 325.46 | 6.68 | 2.97 | 7 | 6 | 6 | 15 | 15 | 14 |
| Bogra | 3885 | 76.4 | 1.97 | 1.44 | 125.69 | 3.24 | 1.31 | 142.15 | 3.66 | 1.3 | 17 | 18 | 19 | 20 | 20 | 20 |
| Rangpur | 9665 | 274.35 | 2.84 | 5.17 | 528.26 | 5.47 | 5.52 | 614.34 | 6.36 | 5.6 | 9 | 8 | 7 | 6 | 5 | 5 |
| Dinajpur | 6653 | 123.4 | 1.85 | 2.33 | 248.12 | 3.73 | 2.59 | 280.82 | 4.22 | 2.56 | 18 | 17 | 17 | 16 | 16 | 16 |

Source: Calculated from Appendix A

# CHAPTER 4

# NATURE OF URBANIZATION IN URBAN CENTERS

## 4.1 Introduction

The number of urban centers of a given size and the distribution of population on various urban centers is an important factor in the study of urbanization. Historically the growth of urban centers in Bangladesh in terms of number as well as size seems to be very much influenced by the change of political status of the country. It is observed that just after the partition of India in 1947 a remarkable growth occurred in large urban centers with the large scale immigration from across the border and also from rural areas (Rusul, 1996). Again there was a rapid growth of urban centers followed by an explosive growth of big cities after the liberation of Bangladesh in 1971. Development of new growth centers and flexibility in the definition of urban area mainly contributed to this rapid growth. Cities with more than 100,000 population increased from 9 in 1981 to 18 in 1991 and to 21 in 2001. The total number of urban centers increased from 492 in 1981 to 522 in 1991 and to 536 in 2001 (Table 4.1). According to the recent census, above 50 percent of the national urban population is concentrated in four metropolitan cities- Dhaka, Chittagong, Khulna and Rajshahi.

The nature of urbanization at different hierarchies of urban centers is studied here for the period 1981-2001. In doing so it examined the trends of growth of urban centers in Bangladesh on the basis of population size and at the same time it analyzed change in rank order of urban centers for the last three consecutive census periods.

## 4.2 Hierarchies of urban centers

The hierarchy of urban centers in Bangladesh is almost same for three consecutive censuses of 1981, 1991 and 2001. In population census 1981, the urban area according to their functions and sizes was categorized as (i) statistical metropolitan area, (ii) municipality, (iii) other urban area and (iv) thana headquarters (BBS, 1987, p.9). Again, in 1991 census the

urban areas have been classified into five categories according to its function and size. These are: (i) mega city, (ii) statistical metropolitan area, (iii) municipality, (iv) thana headquarters and (v) other urban areas (BBS 1997, p.4). In the census 2001, urban areas of the country have been classified into four distinct classes on the basis of their population size (BBS 2003, pp. 28-29). These are:

*(1) Mega city:* Any metropolitan area having population more than 5.0 million is termed as mega city. According to population census 2001, Dhaka is the only mega city of the country. The entire area of Dhaka City Corporation and the thanas of Gazipur Sadar, Narayanganj Sadar, Bandar, Savar and Keraniganj are included in Dhaka Mega city.

*(2) Statistical Metropolitan Area (SMA).* The City Corporations of the country and the adjacent areas having urban characteristics have been termed as Statistical Metropolitan Area in the census 2001. Excluding Dhaka which is a mega city, Chittagong, Khulna and Rajshahi are the SMA's of the country.

The areas covered under three SMA's have been described below:

*Chittagong SMA.* The entire area of Chittagong City Corporation and the thana of Hathazari, Sitakunda and Karnaphuli are included in Chittagong SMA.

*Khulna SMA:* The entire area of Khulna City Corporation and the thanas of Rupsa and Dighulia are included in Khulna SMA.

*Rajshahi SMA.* The entire area of Rajshahi City Corporation and the Paba thana is included in Rajshahi SMA.

*(3) Paurashavas:* The incorporated areas declared by the Ministry of Local Government Rural Development and Co-operatives as paurashavas have been considered as paurashava in the census 2001.

*(4) Other Urban Area:* The thana headquarters of the country which is not declared as paurashava during census operation and other non-paurashava towns which conform more or less urban characteristics are considered as other urban area.

### 4.3 Growth of Urban Centers from 1981 to 2001

The trend of growth of urban centers is considerably influenced by the pattern of population growth prevailing in Bangladesh at any particular time. Table 4.1 shows the number of urban centers in Bangladesh during 1981-2001. It is found from this Table that up to 1981 there was no city in Bangladesh having population more than 5 millions, as a result there was no mega city at that time. In 1991 census Dhaka's population reached to 6487459, then it was termed as mega city. The numbers of statistical metropolitan areas remained unchanged since 1981. Again, the inclusion of new paurashava areas in census to census is a major cause for the growth of urban population. The number of paurashavas increased from 71 in 1981 to 107 in 1991 and in 2001 it increased to 223 including 4 SMA's that includes 11 paurashavas.

Table 4.1: Urban Centers in Bangladesh (1981-2001)

| Urban Centre | Number | | |
|---|---|---|---|
| | 1981 | 1991 | 2001 |
| Mega City | - | 1 | 1 |
| Statistical Metropolitan Area | 4 | 3* | 3 |
| Municipality | 71 | 107 | 223 |
| Urban Growth Center | 417 | 415* | 309* |
| **Total** | **492** | **522** | **536** |

*Decrease due to conversion of Dhaka SMA as Dhaka Mega city & urban growth centers as municipalities

#### 4.3.1 Mega city

Dhaka the only mega city of Bangladesh is also the National capital of the country. It consists of Dhaka City Corporation (including Aminbazar of Savar thana), Tongi, Gazipur, Savar and Narayanganj Paurashavas and the adjoining other urban area covering parts of Demra, Gulshan, Lalbag, Mirpur, Sabujbag, Uttara, Gazipur, Savar, Narayanganj and Bandar thanas and the entire thana of Keraniganj (BBS. 1997). It has emerged as a fast growing mega city in recent times. It began with a manageable population of 2.2 million in 1975 which reached 12.3 million in 2000. The growth rate of the population during 1974-2000 was 6.9% (UN, 1998). There is no city in the world, which has experienced such a

high growth rate in population during this period. The United Nations (1999) describes the rapid population growth of this city as 'exceptional'.

Table 4.2 shows the population and area of Dhaka mega city at different levels - city corporation and paurashava (PSA) and other urban area (OUA). Dhaka City has faced its highest rate of physical and population growth during 1981-1991, with the population doubling during that decade and the city expanding from 402 sq. km to 1353 sq. km. In 1995, a new master plan was prepared for the further development of Dhaka City and the recent construction of a bridge over the Buriganga river has encouraged the expansion of Dhaka city in a southern direction to the other side of the river (Siddiqui et. al. 2000, cited on Hossain, 2006). It was found from Table 4.3 that in the interval of 1981-1991 the variation of area and population was 236.57 percent and 88.58 percent respectively. At the same time the annual average growth rate of population was 6.34 percent. This decadal variation declined in the next decade (1991-2001). However, the further expansion of Dhaka City is constrained by physical barriers such as the low-lying flood prone areas around the city. Also, valuable agricultural and forest land will have to be sacrificed if the built-up area is to increase. The population of the city is increasing very rapidly primarily due to rural-urban migration. The population of the city reached to 9,672,763 in 2001 with an annual average growth rate of about 4 percent. In 2001, the capital city Dhaka alone accounted for nearly 33.06 percent of the total urban population. In 1981 the density of population in Dhaka city was 8558 per sq. km and as the area increased several times in 1991 it decreased to 4795 per sq. km.

From Table 4.3, it is found that during 1991-2001 the area and population variation of Dhaka mega city was 1.34 percent and 49.1 percent respectively. As the area expansion was very low compare to the population growth the density of population increased from 4795 per sq. km. to 7054 per sq. km. in the same interval of time. Understandably, these additional people have created tremendous pressure on the urban land, utility services and other amenities of urban life. This has resulted in an adverse effect on the urban environment where a large number of people have settled in slums and squatter settlements where they lived below the poverty line (Hossain, 2004 cited on Hossain, 2006).

Table 4.2: Population and Area of Dhaka mega city, 1981-2001

| Locality | 1981 | | 1991 | | 2001 | |
|---|---|---|---|---|---|---|
| | Population | Area (sq.km) | Population | Area (sq.km) | Population | Area (sq.km) |
| City Corp. & PSA | 2816805 | 208 | 4232034 | 276 | 6236965 | 289.92 |
| OUA | 623342 | 194 | 2255425 | 1087 | 3435798 | 1081.24 |
| **Megacity*/ SMA** | **3440147** | **402** | **6487459** | **1353** | **9672763** | **1371.16** |

*In 1991 Dhaka SMA gained the status of Mega city.
Source: BBS, 1997 and BBS, 2003

Table 4.3: Particulars of Dhaka mega city in respect of Population and Area. 1981-2001

| Particulars | 1981 | 1991 | 2001 |
|---|---|---|---|
| % of Intercensal Variation of Population | - | 88.58 | 49.1 |
| % of Intercensal Variation of Area (in sq. km.) | - | 236.57 | 1.34 |
| Density (per sq. km.) | 8558 | 4795 | 7054 |
| Annual Average Growth Rate of Population* | - | 6.34 | 3.99 |

*Exponential Growth Rate
Source: Calculated from Table 4.2

### 4.3.2 Statistical Metropolitan Area (SMA)

The City Corporations of the country and the adjacent areas with urban characteristics and population from 500,000 to 4,999,999 are termed as Statistical Metropolitan Area in the census 2001. Among the six city corporations in Bangladesh, excluding Dhaka which is a mega city other three divisional cities- Chittagong, Khulna and Rajshahi are the SMA's of the country. The population and area of these three SMA's with percentage of decadal variation are shown in Table 4.4. Among these three SMA's Chittagong is the largest metropolitan area in respect of both land area and population. Again comparing Khulna and Rajshahi SMA, Khulna is larger than Rajshahi in respect of population and Rajshahi is larger than Khulna on the basis of land area. The variation of both population and area of the three SMA's is several times higher in the decade 1981-1991 than in 1991-2001. In 2001,

nearly 50.46 percent of the total urban population is concentrated in Dhaka mega city. Chittagong, Khulna and Rajshahi Statistical Metropolitan Areas (SMAs).

Table 4.4: Population and Area of Statistical Metropolitan Areas (1981-2001)

| SMA | Population | | | Area (sq. km) | | |
|---|---|---|---|---|---|---|
| | 1981 | 1991 | 2001 | 1981 | 1991 | 2001 |
| Chittagong | 1390684 | 2079968 | 3265451 | 698.21 | 986.34 | 1044.91 |
| | - | **49.56** | **57.00** | - | **41.27** | **5.94** |
| Khulna | 642000 | 921365 | 1172831 | 73.72 | 267.42 | 267.42 |
| | - | **43.52** | **27.29** | - | **262.75** | **0** |
| Rajshahi | 253726 | 507435 | 651062 | 86.03 | 377.09 | 377.09 |
| | - | **99.99** | **28.3** | - | **338.32** | **0** |

The underlined figures are percentage of decadal variation.

***Chittagong Statistical Metropolitan Area (SMA)***

Chittagong, the commercial capital of Bangladesh, is the second largest Metropolitan Area. It is also the biggest port city of Bangladesh. Chittagong Municipal Committee was established in 1863 and in 1864 it was reconstituted as Municipality. In 1981 Chittagong Municipal Corporation gained the status (having population from 500000 to 4999999) of Statistical Metropolitan Area. Table 4.5 is a breakdown of Table 4.4. The population and area of Chittagong SMA at its two levels- City Corporation (including paurashavas) and other urban area is shown here. It is remarkable that the population of City Corporation including two paurashavas – Patiya and Sitakunda Municipality is 2 to 3 times higher than the population of other urban area whereas the area of other urban area (i.e. thana headquarters and urban growth centers) is 3 to 4 times larger than that of city corporation and paurashava areas

Table 4.5: Population and Area of Chittagong SMA, 1981-2001

| Locality | 1981 | | 1991 | | 2001 | |
|---|---|---|---|---|---|---|
| | Population | Area (sq.km) | Population | | Population | Area (sq.km) |
| City Corp & PSA | 1025846 | 180.21 | 1392860 | 209.67 | 2110259 | 206.66* |
| Other Urban Area | 364838 | 518 | 687108 | 780.46 | 1155192 | 838.25 |
| **SMA Total:** | **1390684** | **698.21** | **2079968** | **986.34** | **3265451** | **1044.91** |

*Change due to cartography upgrading

Source: Source: BBS, 1997 and BBS, 2003

Table 4.6: Particulars of Chittagong SMA in respect of Population and Area, 1981-2001

| Particulars | 1981 | 1991 | 2001 |
|---|---|---|---|
| Density (per sq.km.) | 1992 | 2109 | 3125 |
| Annual Average Growth Rate of Population* | - | 4.03 | 4.51 |

*Exponential Growth Rate
Source: Calculated from Table 4.5

***Khulna Statistical Metropolitan Area (SMA)***

Khulna is the third largest city of the country. It has been a place of commercial importance for more than 160 years. Its importance grew rapidly with the establishment of large and small scale industries in this city before and after liberation of Bangladesh. Khulna Municipality was established in 1884 and in 1991 it was upgraded to Khulna City Corporation. It was termed as Khulna Statistical Metropolitan Area in 1980 covering Khulna City Corporation and its adjoining other urban areas. In Table 4.7 the population and area of Khulna SMA along with its City Corporation and other urban area is shown. It is observable that the concentration of population is too much high in city corporation area than in other urban area. Table 4.8 shows that during 1991-2001 though the area of Khulna SMA was unchanged the population increased with annual average growth rate of 2.41 percent and the density of population increased from 3445 /sq. km to 4386 /sq. km in Khulna statistical metropolitan area.

Table 4.7: Population and Area of Khulna SMA, 1981-2001

| Locality | 1981 | | 1991 | | 2001 | |
|---|---|---|---|---|---|---|
| | Population | Area (sq.km) | Population | Area (sq.km) | Population | Area (sq.km) |
| City Corporation | 561945 | 40.25 | 663340 | 70.1 | 770498 | 70.1 |
| Other Urban Area | 80055 | 33.47 | 258025 | 197.32 | 402333 | 197.32 |
| **SMA Total:** | **642000** | **73.72** | **921365** | **267.42** | **1172831** | **267.42** |

Source: BBS, 1997 and BBS, 2003

Table 4.8: Particulars of Khulna SMA in respect of Population and Area, 1981-2001

| Particulars | 1981 | 1991 | 2001 |
|---|---|---|---|
| Density (per sq.km.) | 8709 | 3445 | 4386 |
| Annual Average Growth Rate of Population* | - | 3.61 | 2.41 |

*Exponential Growth Rate
Source: Calculated from Table 4.7

***Rajshahi Statistical Metropolitan Area (SMA)***

The concept of Statistical Metropolitan Area was introduced in the Population Census 1981 and since then Rajshahi City Corporation was termed as Rajshahi Metropolitan Area comprising of Rajshahi City Corporation and the adjoining area with urban characteristics. Table 4.9 depicts that though the area of City Corporation is low than the other urban area which includes thana headquarters and urban growth centers the case is just opposite for population i.e. more population lived in City Corporation area than in other urban areas in the three census years. Table 4.10 shows the density and annual average growth rate of population in Rajshahi statistical metropolitan area during 1981-2001.

Table 4.9: Population and Area of Rajshahi SMA, 1981-2001

| Locality | 1981 | | 1991 | | 2001 | |
|---|---|---|---|---|---|---|
| | Population | Area (sq.km) | Population | Area (sq.km) | Population | Area (sq.km) |
| City Corporation | 165821 | 29.83 | 294056 | 96.68 | 388811 | 96.68 |
| Other Urban Area | 87905 | 56.2 | 213379 | 280.41 | 262251 | 280.41 |
| **SMA Total:** | **253726** | **86.03** | **507435** | **377.09** | **651062** | **377.09** |

Source: BBS, 1997 and BBS, 2003

Table 4.10: Particulars of Rajshahi SMA in respect of Population and Area, 1981-2001

| Particulars | 1981 | 1991 | 2001 |
|---|---|---|---|
| Density (per sq.km.) | 2949 | 1346 | 1727 |
| Annual Average Growth Rate of Population* | - | 6.93 | 2.49 |

*Exponential Growth Rate
Source: Calculated from Table 4.9

### 4.3.3 Paurashava

A *paurashava* or urban growth centre is defined as the locality containing over 5,000 people who enjoy modern amenities of life such as improved road transportation, telephone, electricity, sewerage, newspaper, and function as a unit of local government who formulate and implement local development planning. In urban areas, City Corporations and Paurashavas are supposed to play a vital role for the development of towns and cities. They render services to the urban dwellers through planning, designing, implementing and maintaining the infrastructure and essential services within the jurisdiction. Paurashavas are important administrative and planning unit for Bangladesh. According to the Census of 1981 there were 71 paurashavas which increased to 107 in 1991 and in 2001 there are 223 paurashavas in the country. The Figure 4.1 below shows the growing number of paurashavas in Bangladesh during 1981-2001.

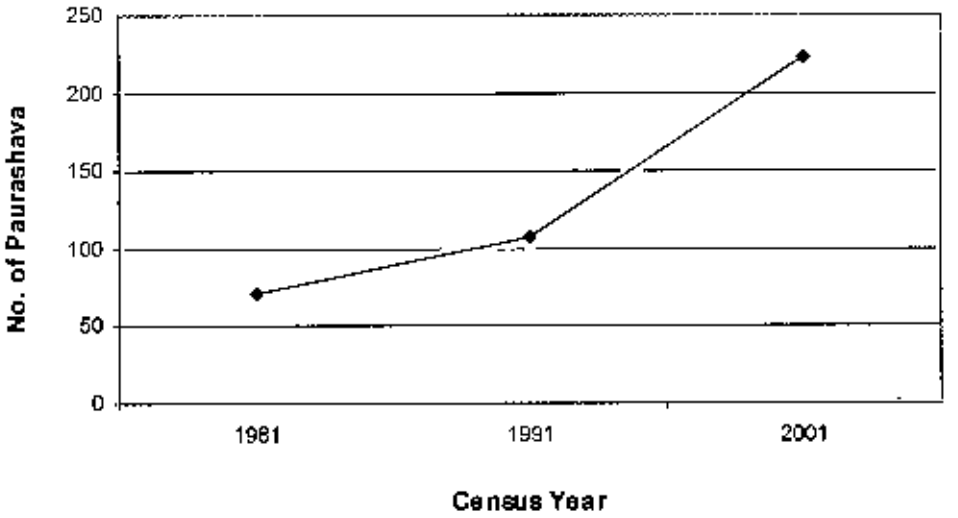



Figure 4.1: Increasing Number of Paurashavas in Bangladesh (1981-2001)

In Table 4.11 the total population of paurashavas under twenty regions in three consecutive censuses (i.e. 1981, 1991 and 2001) and the percentage of inter-censual variation of population are given. It is observed from this Table that the total municipal population of region Dhaka was highest among the twenty regions. Dhaka was followed by Chittagong, Khulna, Rajshahi, Rangpur, Mymensingh and Comilla region in descending order according to the number of municipal population. During 1981-1991 the percentage of variation of municipal population was highest in Hill-Tracts region and it was 154.42 percent. The main

reason of this huge variation was upgradation of hilly areas into urban localities and settlements of internal migrants into urban localities by giving incentives. Again during 1991-2001 this variation was highest in Barisal and Sylhet region with 439.56 percent and 200.31 percent respectively. These may be explained by the declaration of Barisal and Sylhet as separate divisions and the upgradation of Barisal and Sylhet paurashavas as city corporations by this time. The municipal population comprised of 58.97 percent, 56.97 percent and 68 33 percent of national urban population respectively in 1981, 1991 and 2001.

Table 4.11: Region-wise Population of Paurashavas, 1981-2001

| Regions | Population* | | | Percentage of Intercensual Variation | |
|---|---|---|---|---|---|
| | 1981 | 1991 | 2001 | 1981-1991 | 1991-2001 |
| Dhaka | 2958517 | 4586222 | 6680700 | 55.02 | 45.67 |
| Mymensingh | 311646 | 440760 | 674340 | 41.43 | 52.99 |
| Jamalpur | 140029 | 215233 | 431060 | 53.71 | 100.28 |
| Tangail | 109243 | 152194 | 342520 | 39.32 | 125.05 |
| Faridpur | 186850 | 233132 | 569980 | 24.77 | 144.49 |
| Chittagong | 1055460 | 1477672 | 2276500 | 40.00 | 54.06 |
| Hill-1racts | 36405 | 92620 | 135000 | 154.42 | 45.76 |
| Comilla | 280981 | 399076 | 797380 | 42.03 | 99.81 |
| Noakhali | 177736 | 241782 | 452960 | 36.03 | 87 34 |
| Sylhet | 179504 | 228814 | 687160 | 27.47 | 200.31 |
| Khulna | 677614 | 851739 | 1024060 | 25.70 | 20.23 |
| Jessore | 258207 | 375537 | 647120 | 45.44 | 72.32 |
| Kushtia | 158594 | 235420 | 293940 | 48.44 | 24.86 |
| Barisal | 218927 | 318660 | 1719360 | 45.56 | 439.56 |
| Patuakhali | 58345 | 66763 | 157600 | 14.43 | 136.06 |
| Rajshahi | 307357 | 640481 | 1053440 | 108.38 | 64.48 |
| Pabna | 232945 | 352932 | 551260 | 51 51 | 56.19 |
| Bogra | 117032 | 203573 | 343640 | 73.95 | 68.80 |
| Rangpur | 399124 | 520584 | 778900 | 30.43 | 49.62 |
| Dinajpur | 133882 | 257578 | 373320 | 92.39 | 44.93 |
| **TOTAL:** | **7998398** | **11890772** | **19990240** | **48.66** | **68.12** |
| National Urban Pop[n] | 13562504 | 20872174 | 29256592 | | |
| Percentage of Urban Population | 58.97 | 56.97 | 68.33 | | |

*It also includes population of paurashavas under SMA

### 4.4 Distribution of Urban Population by Size Classes:

The urban units of Bangladesh have been classified into the following size classes (BBS 1997, p. 23) -

(i) Towns (T) : Population, less than 100,000

(ii) Cities (C) : Population, 100000 – 499,999

(iii) Statistical Metropolitan Area (SMA): Population, 500.000-4,999,999

(iv) Mega city : Population 5.000.000 and above

As the population data according to towns were not available so it can not be included in this study.

#### 4.4.1 Cities:

The process of urban growth is closely related to the size distribution of cities. As the urban population grows, will it be accommodated in a large number of small cities, or in a small number of large cities, or in a variety of city sizes? The population size of cities having more than 100000 population in 1981, 1991 and 2001 census have been presented in Table 4.12. In 1981 census there were only 5 urban centers (municipal cities) exceeding population of 100,000 each, these exclude 4 SMAs. Again, apart from one mega city and three statistical metropolitan areas (SMA) there are 14 cities in Bangladesh having population of 100000 and above. In 2001 census the number of cities having population more than 100,000 increased to 17 excluding the four SMAs and the paurashavas that were included under these SMAs (among the 7 paurashavas under Dhaka SMA the population size of 5 paurashavas were more than 100,000). These are Sylhet, Rangpur, Barisal, Mymensingh, Jessore, Nawabganj, Bogra, Comilla, Dinajpur, Sirajganj, Jamalpur, Madhabdi, Tangail, Pabna, Naogaon, Brahmanbaria, and Saidpur. Among these cities Sirajganj, Madhabdi and Saidpur are new additions in the list of previous census 2001. The number of population in some of these cities consequently their rank positions improved from one decade to another; such cities are Sylhet, Rangpur, Jamalpur and Nawabganj. Among these Sylhet improved its position from 5$^{th}$ in 1981 to 2$^{nd}$ in 1991 and in 2001 it upgraded in 1$^{st}$ position. Declaration of Sylhet as a separate division of the country may be one of the reasons for high growth of urban population in this area. Interestingly the rank position of Dinajpur and Tangail cities remained unchanged during 1991-2001. In some

cities viz. Mymensingh, Bogra, Comilla, Pabna and Naogaon the size of urban population increased but their rank positions declined from decade to decade. One exception found in the case of Brahmanbaria where the number of urban population decreased during 1991-2001.

Table 4.12: Population Distribution of Cities (excluding Mega city and SMAs) having more than 100000 Population, 1981-2001

| Name of City | Population | | | Rank | | |
|---|---|---|---|---|---|---|
| | 1981 | 1991 | 2001 | 1981 | 1991 | 2001 |
| Sylhet | 100514 | 234355 | 320280 | 5 | 2 | 1 |
| Rangpur | 121888 | 208294 | 251840 | 3 | 4 | 2 |
| Barisal | 142098 | 202746 | 224660 | 1 | 5 | 3 |
| Mymensingh | - | 273350 | 209660 | - | 1 | 4 |
| Jessore | 115495 | 161349 | 192240 | 4 | 7 | 5 |
| Nawabganj | - | 130577 | 163400 | - | 10 | 6 |
| Bogra | - | 164114 | 162140 | - | 6 | 7 |
| Comilla | 128212 | 225259 | 160920 | 2 | 3 | 8 |
| Dinajpur | - | 136133 | 156300 | - | 9 | 9 |
| Sirajganj | - | - | 129720 | - | - | 10 |
| Jamalpur | - | 109126 | 128060 | - | 12 | 11 |
| Madhabdi | - | - | 122780 | - | - | 12 |
| Tangail | - | 106004 | 119060 | - | 13 | 13 |
| Pabna | - | 137577 | 112460 | - | 8 | 14 |
| Naogoan | - | 101266 | 107160 | - | 14 | 15 |
| Brahmanbaria | - | 121756 | 104120 | - | 11 | 16 |
| Saidpur | - | - | 100240 | - | - | 17 |

Source: BBS 1997, BBS 2003

# CHAPTER 5

# ANALYSIS OF INTER-REGIONAL VARIATION OF URBANIZATION

## 5.1 Introduction

Urbanization is influenced by a number of factors including rural-urban migration, natural population increase, and annexation of area. Because rates of natural increase are generally slightly lower in urban than in rural areas, the principal reasons for rising levels of urbanization are rural-urban migration, the geographic expansion of urban areas through annexations. and the transformation and reclassification of rural villages into small urban settlements. The expansion of the metropolitan periphery can be caused both by the arrival of new migrants and by the sub-urbanization of the middle class out of the central city. The relative importance of each of these various causes of urbanization and suburbanization varies both within and between regions and countries. Similarly in Bangladesh there is spatio-temporal variation of urbanization from region to region. It is observed from Table 3.5 (Chapter 3) that the range of urbanization varied from census to census. In 1981 census the range was between 7.44 - 38.94 percent, in 1991 census it was between 8.64-53.94 percent and in 2001 census it was 11.38-61.30 percent. The interregional variation in urbanization indicates the unstable economic growth and lack of urban policy in the regions of Bangladesh. Here, the urban expansion has occurred only in terms of population size, devoid of urban facilities, let alone urbanism.

In this chapter the inter-regional variations of urbanization in Bangladesh has been studied. Along with this, regional inequality in the distribution of urban population will be analyzed using Location Quotient (L.Q.) of different regions and Gini Index.

This study analyzed the factors causing regional disparity in urbanization and for this various socio-economic and infrastructural factors has been taken for analysis. Again, all the factors are not equally significant all along. In this regard the changing and relative importance of these factors has been studied using Bivariate Correlation Coefficient.

## 5.2 Analysis of Regional Variation

The spatio-temporal variation of urbanization is analyzed here for the twenty regions of Bangladesh in the years 1981, 1991 and 2001. The variation in regard of urban population and the annual average growth rate of urban population have been estimated for the three censuses. Again to make a clear-cut distinction among the regions in respect of level of urbanization the regions were categorized into three groups: low urbanized region, medium urbanized region and high urbanized region based on the range of level of urbanization. The Analysis of inter-regional variation of urbanization was also carried out using the device Location Quotient (L.Q.) and Gini Index.

### 5.2.1 Intercensal Variation of Urban Population by Regions

In Table 5.1 the intercensal variation of urban population and the percentage of this variation by region during the period 1981-1991 and 1991-2001 have been presented. From this Table it is revealed that during 1981-1991 the regional variation of urban population was higher than that of 1991-2001. That means the number of urban population has been increasing but at a decreasing rate. This statement is not solely true for all the twenty regions. For example in Faridpur region the variation of urban population during 1981-1991 was only 14.70 percent which increased to 52.49 percent from 1991 to 2001. During the decade of 1981-1991 the percentage of variation of urban population was higher in Rajshahi, Bogra and Dhaka region (in descending order) compare to others. This variation of urban population was higher in Tangail, Dhaka and Faridpur region (in descending order) during 1991- 2001. It is remarkable that in the regions having big cities such as Dhaka, Chittagong, Khulna and Rajshahi the variation of urban population decreased from the decade of 1981-1991 to 1991-2001 while in other regions such as in Faridpur, Jamalpur, Tangail, Comilla, Noakhali, Sylhet, Khustia and Patuakhali this variation increased between the same periods.

Table 5.1: Intercensal Variation of Urban Population by Region during 1981-1991 and 1991-2001

| Regions | Urban Population | | | Intercensal Variation | | % of Variation | |
|---|---|---|---|---|---|---|---|
| | 1981 | 1991 | 2001 | 1981-1991 | 1991- 2001 | 1981-1991 | 1991-2001 |
| Dhaka | 3899702 | 7137518 | 10539327 | 3237816 | 3401809 | 83.03 | 47.66 |
| Mymensingh | 717576 | 929531 | 1205111 | 211955 | 275580 | 29.54 | 29.65 |
| Jamalpur | 223160 | 320590 | 467435 | 97430 | 146845 | 43.66 | 45.80 |
| Tangail | 184781 | 281542 | 438011 | 96761 | 156469 | 52.37 | 55.58 |
| Faridpur | 408584 | 468636 | 714636 | 60052 | 246000 | 14.70 | 52.49 |
| Chittagong | 1737698 | 2599931 | 3654118 | 862233 | 1054187 | 49.62 | 40.55 |
| Hill-Tracts | 216512 | 324315 | 433989 | 107803 | 109674 | 49.79 | 33.82 |
| Comilla | 585703 | 811868 | 1185575 | 226165 | 373707 | 38.61 | 46.03 |
| Noakhali | 429891 | 509542 | 748968 | 79651 | 239426 | 18.53 | 46.99 |
| Sylhet | 493060 | 681759 | 987538 | 188699 | 305779 | 38.27 | 44.85 |
| Khulna | 974314 | 1328654 | 1662376 | 354340 | 333722 | 36.37 | 25.12 |
| Jessore | 440729 | 575254 | 822375 | 134525 | 247121 | 30.52 | 42.96 |
| Kushtia | 322326 | 419881 | 557913 | 97555 | 138032 | 30.27 | 32.87 |
| Barisal | 564840 | 735734 | 899909 | 170894 | 164175 | 30.26 | 22.31 |
| Patuakhali | 165246 | 199618 | 262866 | 34372 | 63248 | 20.80 | 31.68 |
| Rajshahi | 571666 | 1126013 | 1527114 | 554347 | 401101 | 96.97 | 35.62 |
| Pabna | 404520 | 592172 | 770643 | 187652 | 178471 | 46.39 | 30.14 |
| Bogra | 203009 | 374169 | 510374 | 171160 | 136205 | 84.31 | 36.40 |
| Rangpur | 735455 | 1014107 | 1307612 | 278652 | 293505 | 37.89 | 28.94 |
| Dinajpur | 283732 | 441340 | 560702 | 157608 | 119362 | 55.55 | 27.05 |

### 5.2.2 Variation in Growth Rate of Urban Population

Table 5.2 shows the annual average growth rates of the regions and their corresponding ranks from 1981 to 2001. It is pragmatic that the growth rates were disorganized with very wide range of fluctuations (Figure 5.1). For example in 1991 the ranks of Rajshahi, Bogra and Dhaka region were 1st, 2nd and 3rd respectively while in 2001 except Dhaka the ranks of Rajshahi and Bogra became 11th and 10th respectively. In 2001 the 1st and 2nd position were occupied by Tangail and Faridpur region correspondingly. Out of twenty regions the growth rates of ten regions viz. Mymensingh, Jamalpur, Tangail, Faridpur, Comilla, Noakhali, Sylhet, Jessore, Kushtia and Patuakhali were increased while the growth rates of Dhaka, Chittagong, Hill-Tracts, Khulna, Barisal, Rajshahi, Pabna, Bogra, Rangpur and Dinajpur regions were decined. The rank position of Dhaka region

Table 5.2: Annual Average Growth Rate of Urban Population by Region and its Rankings (1981-2001)

| Regions | Annual Average Growth Rate | | Ranks | |
|---|---|---|---|---|
| | 1981-1991 | 1991-2001 | 1981-1991 | 1991-2001 |
| Dhaka | 6.04 | 3.92 | 3rd | 3rd |
| Mymensingh | 2.59 | 2.6 | 17th | 16th |
| Jamalpur | 3.65 | 3.77 | 10th | 6th |
| Tangail | 4.19 | 4.45 | 5th | 1st |
| Faridpur | 1.4 | 4.19 | 20th | 2nd |
| Chittagong | 4.03 | 3.44 | 7th | 9th |
| Hill-Tracts | 4.04 | 2.93 | 6th | 12th |
| Comilla | 3.29 | 3.79 | 11th | 5th |
| Noakhali | 1.74 | 3.85 | 19th | 4th |
| Sylhet | 3.22 | 3.72 | 12th | 7th |
| Khulna | 3.07 | 2.23 | 13th | 19th |
| Jessore | 2.7 | 3.58 | 14th | 8th |
| Kushtia | 2.65 | 2.85 | 15th | 13th |
| Barisal | 2.64 | 1.99 | 16th | 20th |
| Patuakhali | 1.91 | 2.78 | 18th | 14th |
| Rajshahi | 6.78 | 3.05 | 1st | 11th |
| Pabna | 3.78 | 2.62 | 8th | 15th |
| Bogra | 6.1 | 3.1 | 2nd | 10th |
| Rangpur | 3.72 | 2.55 | 9th | 17th |
| Dinajpur | 4.45 | 2.39 | 4th | 18th |

Source: Calculated from appendix A

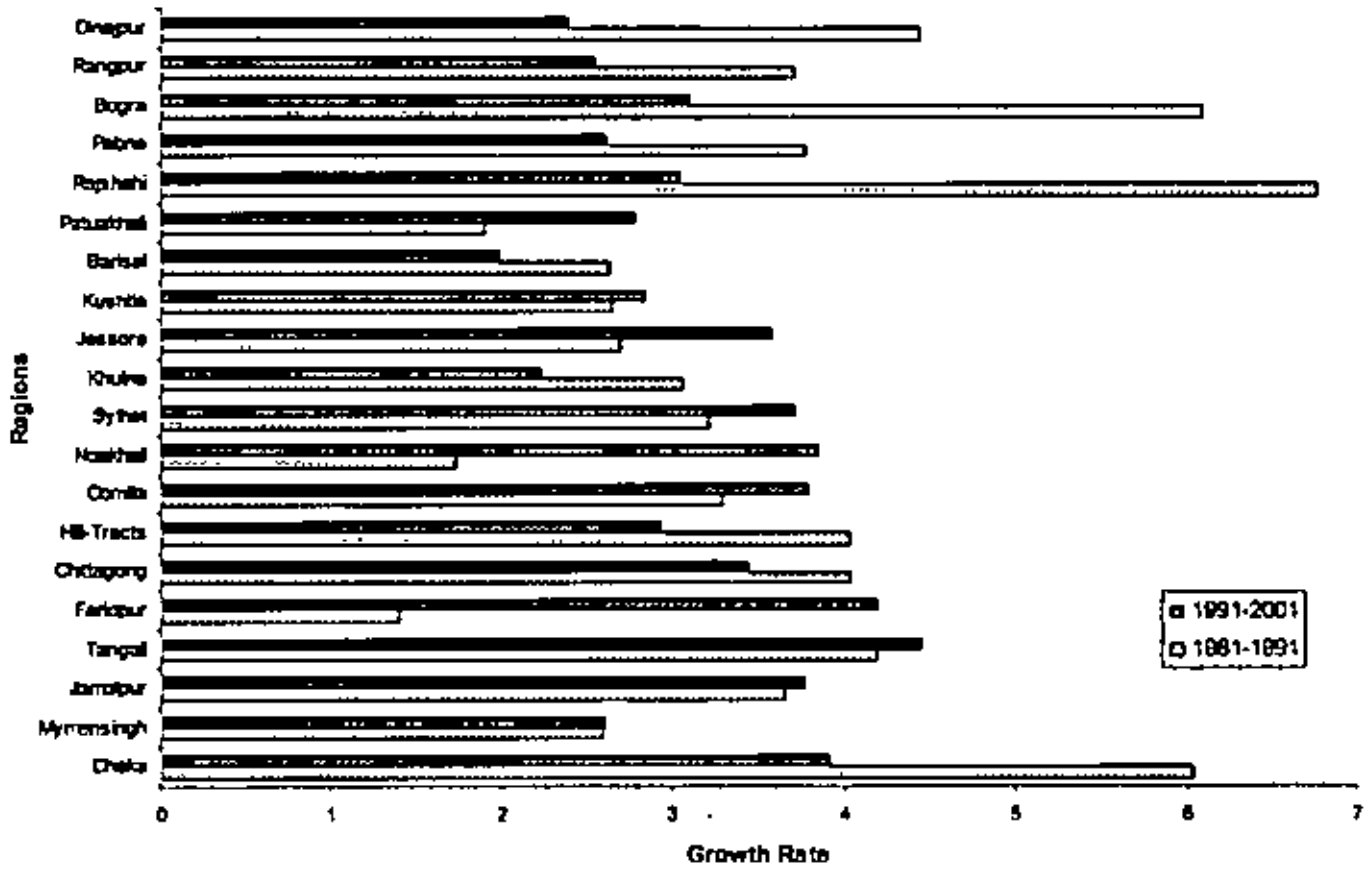



Figure 5.1: Variations in Urban Growth Rate by Regions (1981-2001)

### 5.2.3 Categorization of regions based on level of urbanization

In this study all the regions of Bangladesh has been categorized into three groups on the basis of level of urbanization. These are:

*(1)Low urbanized region:* Those regions which has level of urbanization up to 10 percent.

*(2) Middle urbanized region:* Regions which has level of urbanization from 10.01 percent to 20 percent.

*(3) High urbanized region:* Regions having level of urbanization above 20.01 percent.

In Table 5.3 all the regions with their respective category, range, number has been presented for the last three decades. It is found that the number of low urbanized region is decreasing from one decade to another and in 2001 it is remarkable that there was no region with level of urbanization up to 10 percent. On the other hand the number of middle and high urbanized region is increasing between 1981-1991 and 1991-2001. Dhaka, Chittagong, Hill Tracts and Khulna were the high urbanized regions with level of urbanization more than 20 percent during 1981-1991 and in 2001 Rajshahi region was included in this group. In 1981census there were eight low urbanized regions with level of urbanization up to 10 percent and among those Sylhet, Jamalpur, Bogra and Dinajpur were included in the group of middle urbanized regions with level of urbanization between 10.01 – 20 percent in 1991 census.

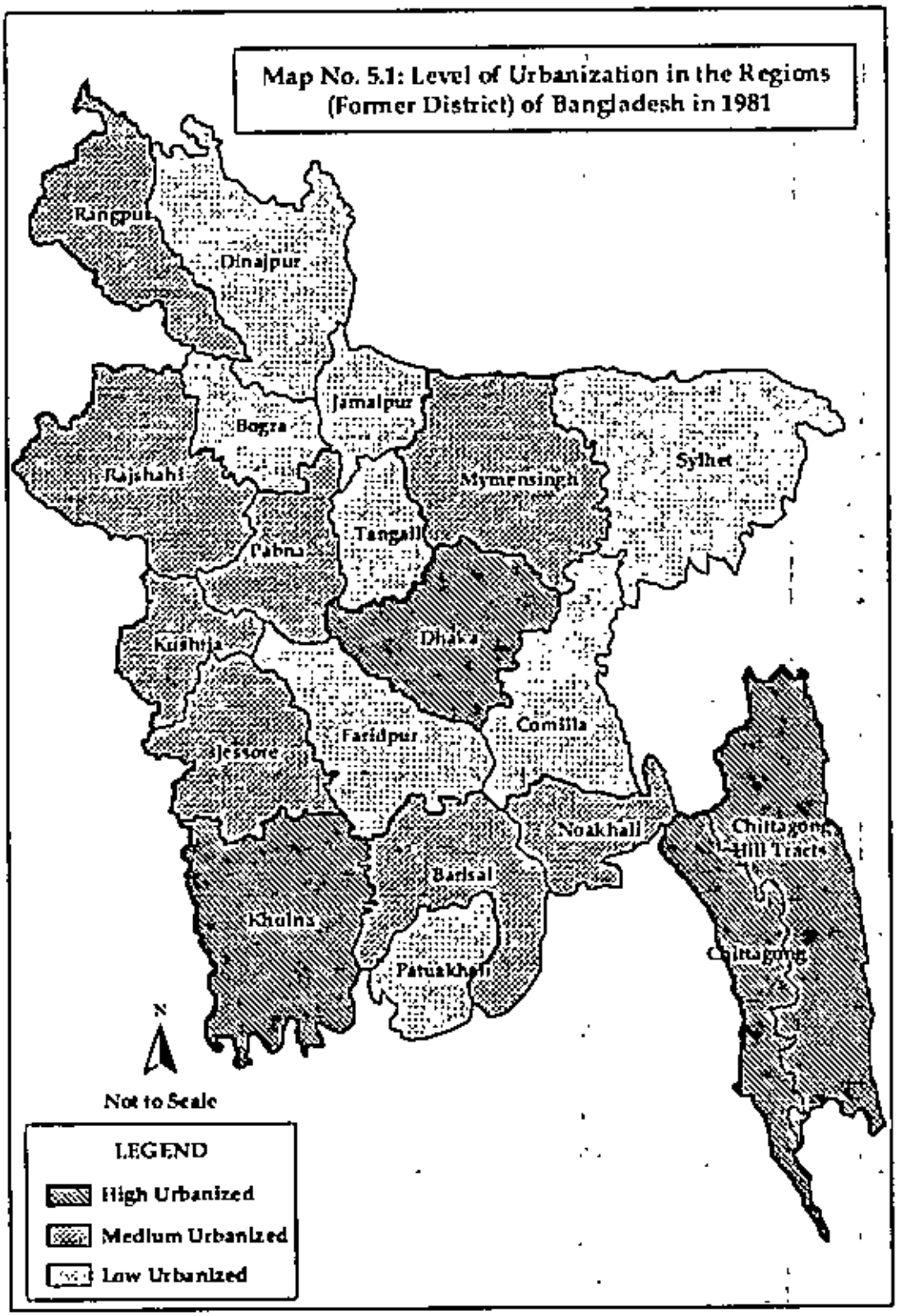


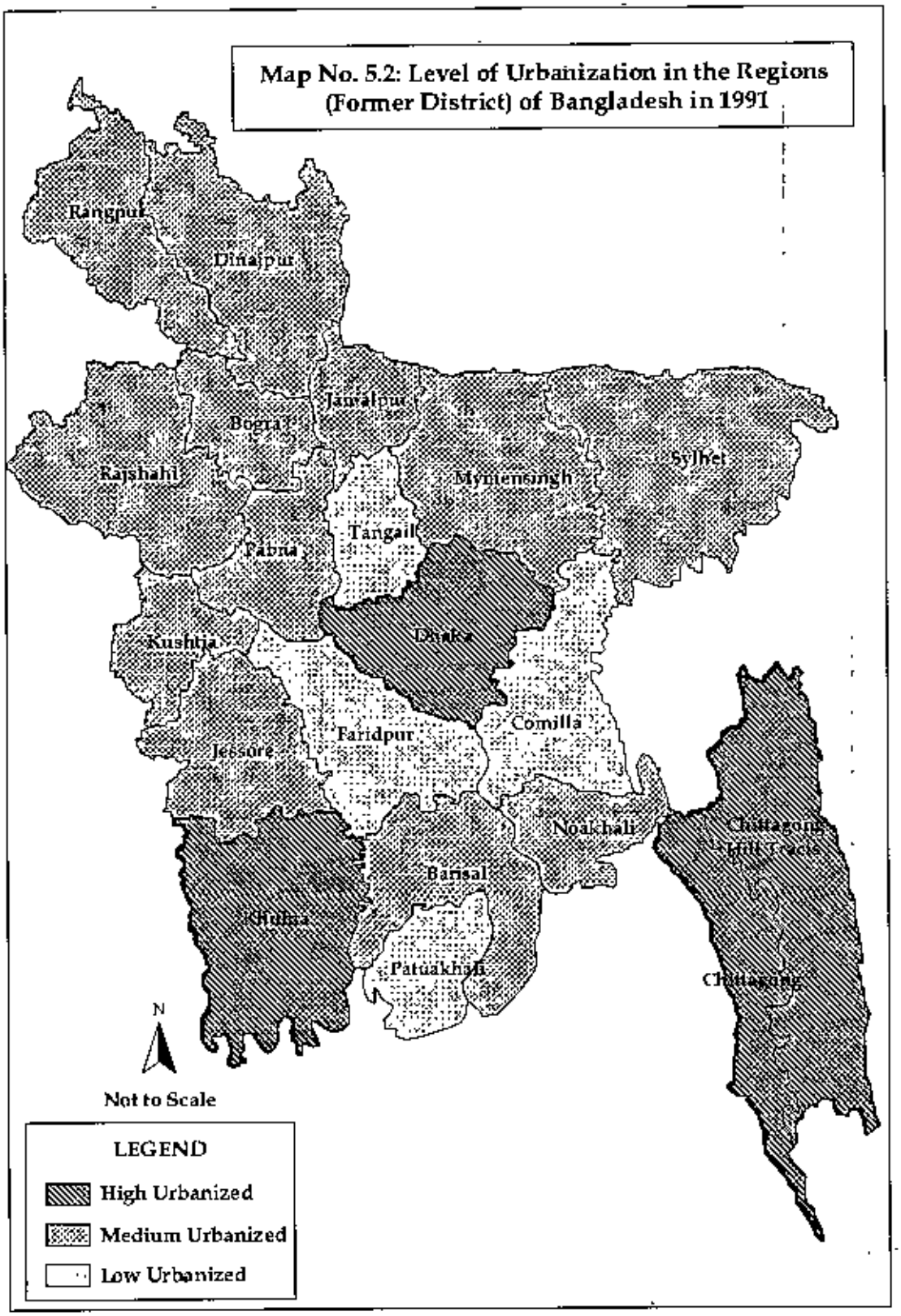
In Map 5.1, 5.2 and 5.3 the regions of Bangladesh has been divided in three categories – low, medium and high urbanized regions according to their level of urbanization for 1981, 1991 and 2001.

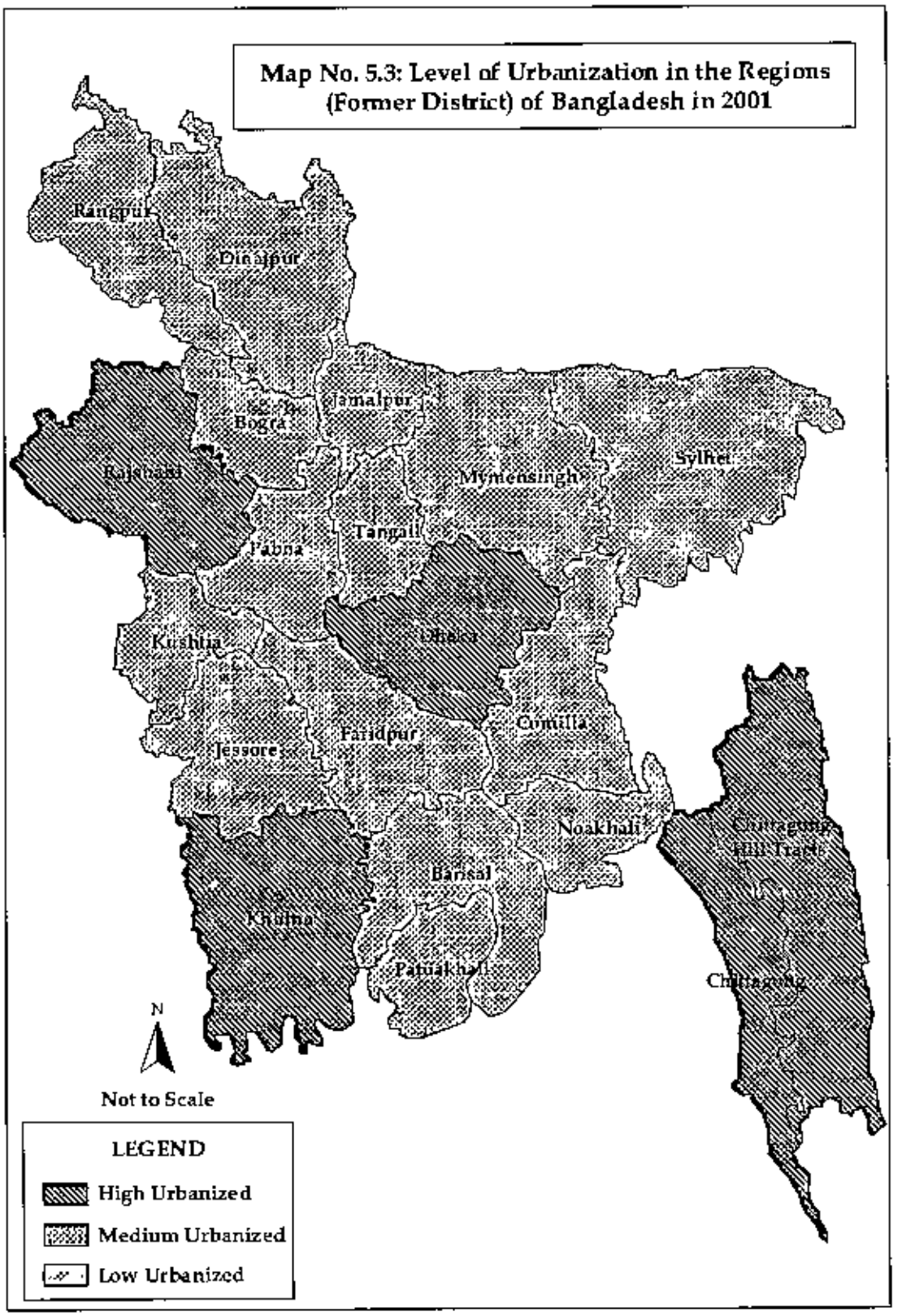
Table 5.3: Categorization of Regions based on Level of Urbanization for 1981, 1991 and 2001

| Category | Range | 1981 | | 1991 | | 2001 | |
|---|---|---|---|---|---|---|---|
| | | Number | Regions | Number | Regions | Number | Regions |
| Low | Up to 10% | 8 | Jamalpur, Tangail, sylhet. Faridpur, Comilla, Patuakhali, Bogra, Dinajpur | 4 | Tangail, Faridpur, Comilla, Patuakhali | 0 | |
| Medium | 10.01 – 20% | 8 | Mymensingh, Noakhali, Jessore, Kushtia, Barisal, Rajshahi, Pabna, Rangpur | 12 | Mymensingh, Jamalpur, Noakhali. Sylhet, Jessore, Kushtia, Barisal, Rajshahi, Pabna, Bogra. Rangpur. Dinajpur | 15 | Mymensingh, Jamalpur, Tangail, Faridpur, Comilla, Noakhali, Jessore, Kushtia, Barisal, Sylhet, Patuakhali, Pabna, Bogra, Rangpur, Dinajpur |
| High | 20.01& Above | 4 | Dhaka. Chittagong, Hill Tracts, Khulna | 4 | Dhaka, Chittagong, Hill Tracts, Khulna | 5 | Dhaka. Chittagong, Hill Tracts, Khulna, Rajshahi |

Source: Prepared based on Table 3.5


Map No. 5.1: Level of Urbanization in the Regions (Former District) of Bangladesh in 1981
Rangpur
Dinajpur
Bogra
Jamalpur
Rajshahi
Mymensingh
Sylhet
Pabna
Tangail
Kushtia
Dhaka
Jessore
Faridpur
Comilla
Noakhali
Chittagong Hill Tracts
Barisal
Khulna
Patuakhali
Chittagong
N
Not to Scale
LEGEND
High Urbanized
Medium Urbanized
Low Urbanized


Map No. 5.2: Level of Urbanization in the Regions (Former District) of Bangladesh in 1991
Rangpur
Dinajpur
Jamalpur
Bogra
Rajshahi
Mymensingh
Sylhet
Tangail
Pabna
Dhaka
Kushtia
Comilla
Faridpur
Jessore
Noakhali
Chittagong Hill Tracts
Barisal
Khulna
Patuakhali
Chittagong
N
Not to Scale
LEGEND
High Urbanized
Medium Urbanized
Low Urbanized


Map No. 5.3: Level of Urbanization in the Regions (Former District) of Bangladesh in 2001
Rangpur
Dinajpur
Jamalpur
Bogra
Rajshahi
Mymensingh
Sylhet
Pabna
Tangail
Kushtia
Dhaka
Jessore
Faridpur
Comilla
Noakhali
Barisal
Khulna
Patuakhali
Chittagong Hill Tracts
Chittagong
N
Not to Scale
LEGEND
High Urbanized
Medium Urbanized
Low Urbanized

### 5.2.4 Analysis of Inter-regional Variation by Location Quotient

An idea about the extent of concentration of urban population in different regions of Bangladesh can be obtained from Table 5.4. It shows the location quotients (L.Q.) of urban population of all the regions for 1981, 1991 and 2001. It appears that the regions whose location quotients exceed unity represent the concentration of urban population in those regions. All along the three decades the L.Q.'s of Dhaka, Chittagong, Hill Tracts and Khulna regions were found greater than one which represents that these regions are over concentrated with urban population. Among these four regions the L.Q. of Dhaka region is found highest whose values are 2.51, 2.74 and 2.61 in 1981, 1991 and 2001 respectively. It indicates that urban population is highly concentrated in Dhaka region. On the other hand those regions whose L.Q.'s are less than unity are less concentrated or deficient with urban population and it is found that among the twenty regions the L.Q. of sixteen regions are less than one. It shows that Bogra and Tangail in 1981, Faridpur and Tangail in 1991 and Patuakhali and Faridpur in 2001 were highly deficient of urban population. The wide variation of the values of L.Q. indicates that urban population is highly concentrated in few regions.

Table 5.4: Region-wise Location Quotients of Urban Population, 1981-2001

| 1981 | | 1991 | | 2001 | |
|---|---|---|---|---|---|
| Regions | L.Q. | Regions | L.Q. | Regions | L.Q. |
| Bogra | 0.48 | Faridpur | 0.44 | Patuakhali | 0.48 |
| Tangail | 0.49 | Tangail | 0.48 | Faridpur | 0.50 |
| Comilla | 0.55 | Patuakhali | 0.49 | Dinajpur | 0.51 |
| Faridpur | 0.55 | Comilla | 0.50 | Sylhet | 0.53 |
| Sylhet | 0.56 | Sylhet | 0.51 | Comilla | 0.54 |
| Dinajpur | 0.57 | Jamalpur | 0.54 | Bogra | 0.56 |
| Patuakhali | 0.58 | Bogra | 0.55 | Mymensingh | 0.56 |
| Jamalpur | 0.59 | Noakhali | 0.56 | Tangail | 0.57 |
| Mymensingh | 0.66 | Dinajpur | 0.56 | Jamalpur | 0.59 |
| Rajshahi | 0.70 | Jessore | 0.60 | Noakhali | 0.60 |
| Jessore | 0.71 | Mymensingh | 0.62 | Rangpur | 0.61 |
| Noakhali | 0.73 | Rangpur | 0.64 | Jessore | 0.63 |
| Rangpur | 0.73 | Barisal | 0.69 | Barisal | 0.65 |
| Pabna | 0.76 | Pabna | 0.72 | Pabna | 0.67 |
| Barisal | 0.78 | Kushtia | 0.76 | Kushtia | 0.71 |
| Kushtia | 0.91 | Rajshahi | 0.87 | Rajshahi | 0.85 |
| Khulna | 1.45 | Khulna | 1.34 | Khulna | 1.22 |
| Hill-Tracts | 1.86 | Hill-Tracts | 1.69 | Hill-Tracts | 1.38 |
| Chittagong | 2.04 | Chittagong | 1.96 | Chittagong | 1.85 |
| Dhaka | 2.51 | Dhaka | 2.74 | Dhaka | 2.61 |

Source: Calculated from appendix A

### 5.2.5 Analysis of Inter-regional Variation by Gini Index

Bangladesh is experiencing urbanization and the trend of urbanization is increasing gradually. But the impact of urbanization will be more effective when the distribution of urban population or the share of national urban population will be almost equal. Urban population distribution for 1981, 1991 and 2001 census has been shown in the Figure 5.2, 5.3 and 5.4 respectively.

It is seen from these Figures that the urban population distribution in Bangladesh was not uniform in all the three decades. This inequality increased with the increasing distance of the Lorenz curve from the perfect distribution line. In 1981 it was moderately skewed. Again in 1991 the distance between perfect distribution line and Lorenz curve is more than that of 1981 and thus for this year the distribution of urban population was more skewed than in 1981. Again in 2001 census this inequality of urban population distribution was slightly decreased compare to 1991 census.

In Figure 5.5 the comparison of urban population distribution for 1981, 1991 and 2001 census is shown. It is apparent from this Figure that the distribution of urban population is more unequal in 1991 than that of 1981 and 2001. And it is more unequal in 2001 than in 1981.

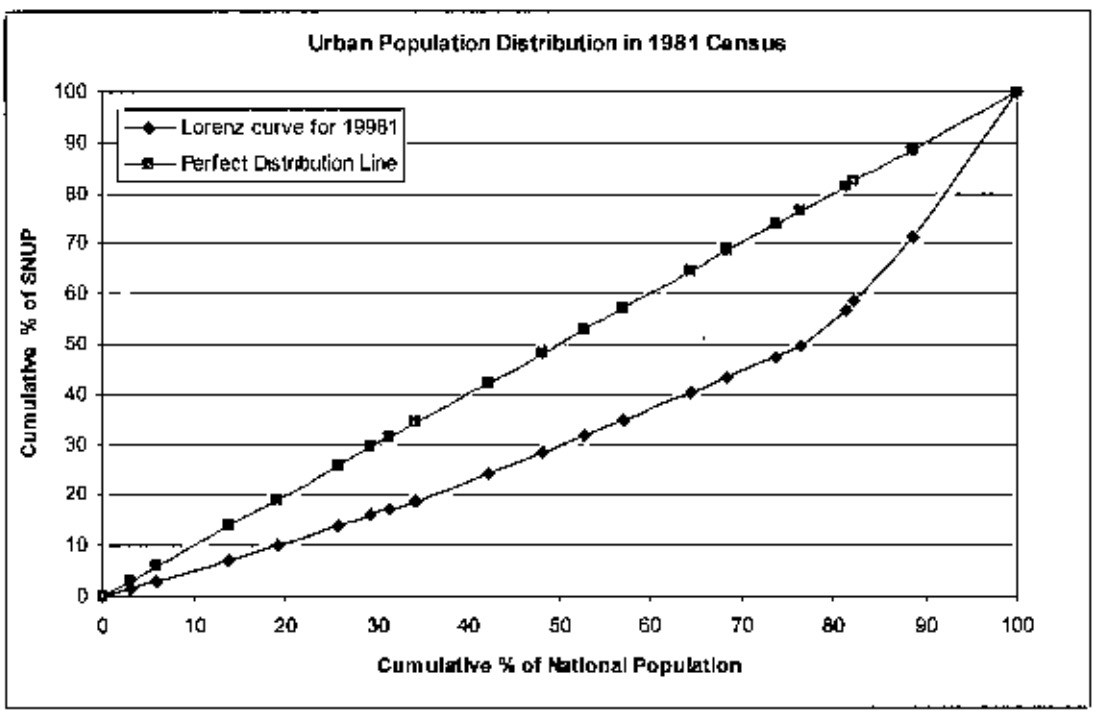



Figure 5.2: Region-wise Distribution of Urban Population in 1981

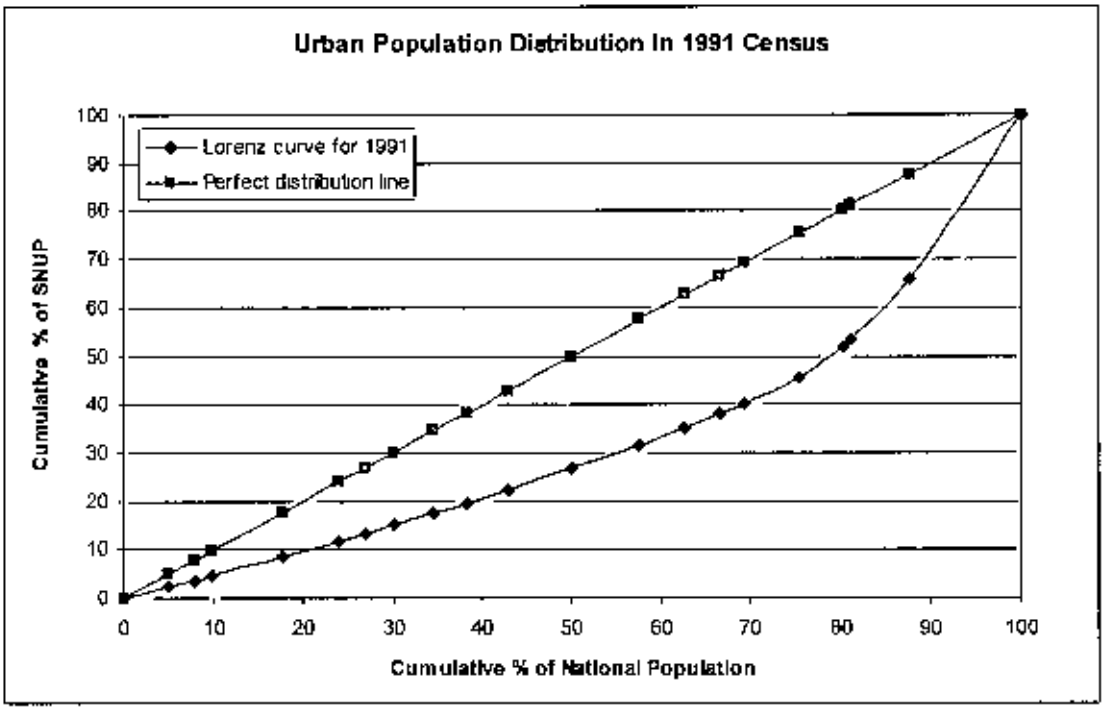



Figure 5.3: Region-wise Distribution of Urban Population in 1991

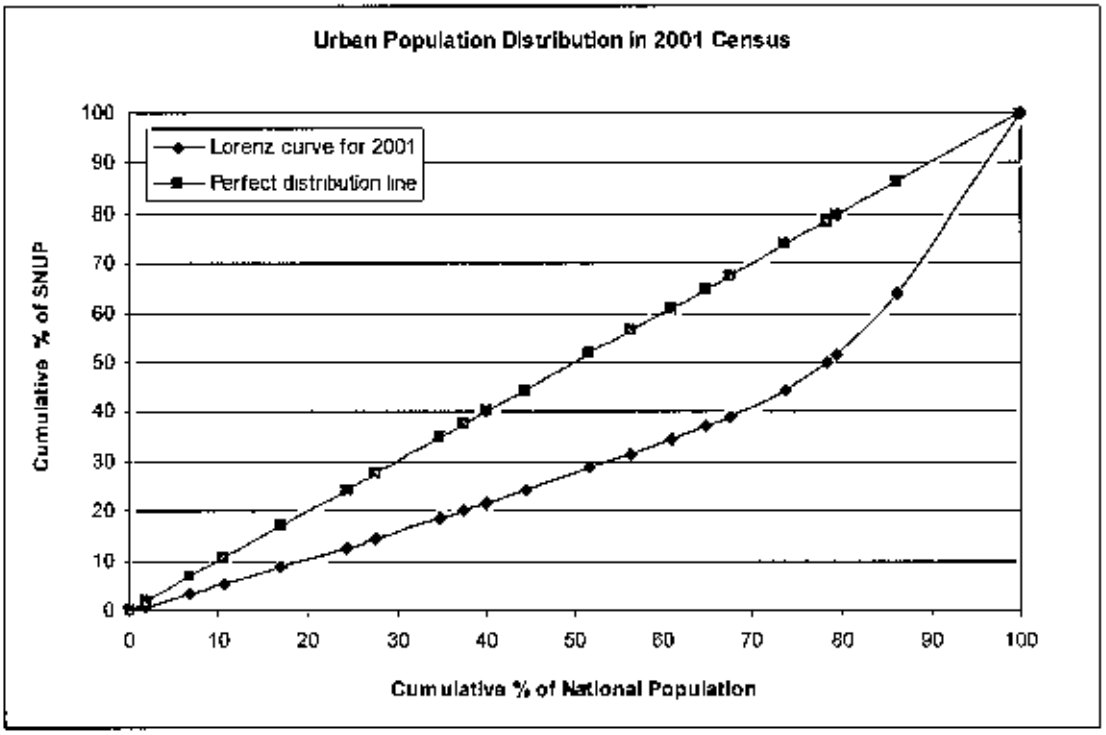



Figure 5.4: Region-wise Distribution of Urban Population in 2001

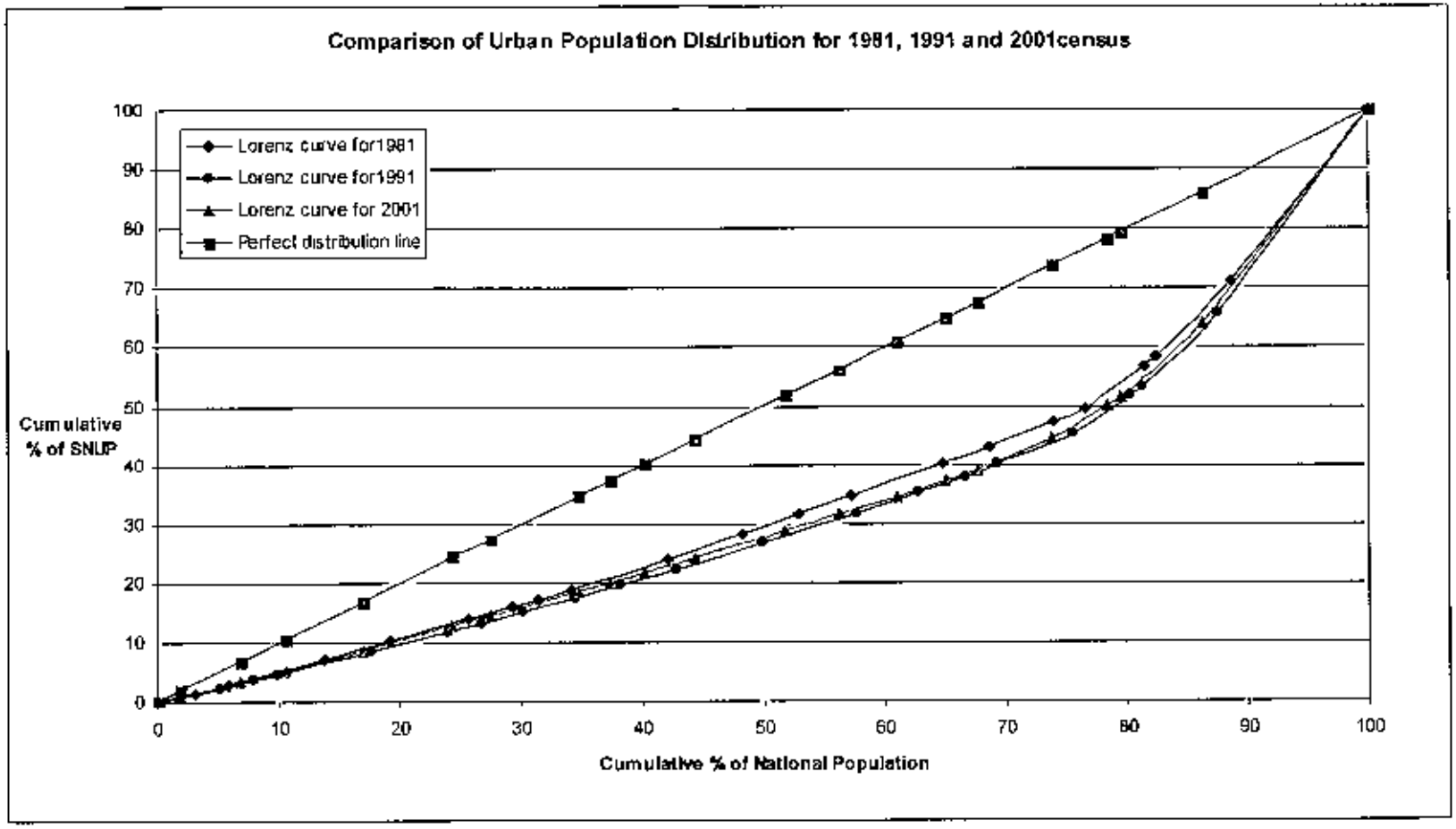



Figure 5.5: Comparison of Region-wise Distribution of Urban Population in 1981, 1991 and 2001

The above fact is more apparently understandable by comparing the Gini-coefficients. To measure the inequality of distribution of urban population among the twenty regions the value of Gini-coefficient has been calculated. As we know that the value of Gini-coefficient (G) range from 0 to 1, where 0 indicates perfect equality and 1 indicates perfect inequality. The calculation of Gini-coefficient is given in Appendix B.

Table 5.5: Gini-coefficients of Urban Population Distribution in 1981, 1991 and 2001

| Census Year | Gini-coefficient |
|---|---|
| 1981 | 0.314 |
| 1991 | 0.354 |
| 2001 | 0.340 |

From the above Table it is revealed that for the year 1981, the value of Gini-coefficient was 0.314 which indicates that the urban population distribution is unequal in the regions of Bangladesh. Again, for the year 1991, it was 0.354 which indicates that the urban population distribution is more unequal than that of 1981. The value of Gini co-efficient was found 0.340 for the year 2001. That means from 1991 to 2001 the inequality in the distribution of urban population slightly decreased. On the whole it is seen that there lies negligible difference between these three values that indicates that the urban population distribution is unequal and it is almost same in these years.

## 5.3 Analysis of the Factors affecting Regional Variation

It is assumed that there are some factors which work behind the regional variation of urbanization in Bangladesh. In a particular region where strong positively correlated variables are available in large amount, the urbanization will be high in that region.

For this study nine variables from socio-economic and infrastructural factors viz. Rural-urban migration (RUM), Percentage of urban Land (PUL), Level of industrialization (LOIND), Percentage of non-agricultural activities (NAA), Literacy rate (LITER), Length of Paved Road (RDLEN), Electricity coverage (ELEC), Water supply coverage (WS) and Sanitation coverage (SANI) were taken for analysis.

The changing aspects of each variable are studied. Here relationships of urbanization with each of the variables are illustrated with scatter diagrams.

### 5.3.1 Degree of Relationship between Urbanization and Factors

The degree of relationship between urbanization and nine selected variables has been shown with scatter diagrams in Appendix C.

Figure C-1 shows a positive relation (although not perfect) between rural-urban migration and urbanization at regional levels in 1991 and 2001(For 1981 census migration data was not available). In 1991 the graph seems very slightly resembling the tendency of a linear relationship. Although these two variables are positively associated, except three or four regions this relation is confined within a short range for all regions.

The scatter diagrams of Figure C-2 shows a strong positive relation between percentage of urban land and urbanization at regional level for 1981, 1991 and 2001. It appears a clear linear patterning of the two variables which is clearly depicted in few large urban centers. For the remaining regions this relation is limited within a short range.

In Figure C-3 the scatter plots show that at the regional level there is a positive relationship between industrialization and urbanization. From few regions it seems that this relation is quite strong in 1981 and 2001 and it is moderate for 1991. For rest of the regions this relation is confined within a short range like the previous cases.

The scatter plots of Figure C-4 show strong positive relation between percentage of non-agricultural activities and urbanization in all the three years of 1981, 1991 and 2001. All the scatter plots seem clearly the tendency of a linear relationship. Similar to the previous cases this relation is restrained within a short range.

Figure C-5 depicts that there is a positive relation between literacy rate and urbanization at regional levels in 1981, 1991 and 2001. This relation is moderate in 1991 and 2001 than in 1981. However all the scatter plots seem slightly resembling the tendency of a linear relationship. Again in most of the regions the correlations are very closer.

Figure C-6 shows that there is a positive relation between these two variables. This relation is moderate in 1981 and 1991 and the scatter plot of 2001 shows a weak positive relation of the two variables. However all the scatter plots seems resembling the tendency of a linear relationship.

Figure C-7 depicts a strong positive relation between water supply coverage and level of urbanization at the regional level in 1981, 1991 and 2001. The scatter plots show the trend of a linear relationship between these two variables. It is evident here that in a handful of larger urban centers where the water supply coverage is higher in those regions the level of urbanization is also higher. On the other hand in rest of regions as the piped water supply coverage is very low this relation is confined in a short range.

Figure C-8 shows a strong positive relation between urbanization and electricity coverage at regional levels in 1991 and 2001. Comparing the two diagrams it is observable that this relation is closer in 1991 than in 2001.A clear patterning to the variables is evident here by this strong relation and both the scatter plots seems resembling the tendency of a linear relationship.

Figure C-9 reveals that there is a positive relation between sanitation coverage and urbanization at the regional levels both in 1991 and 2001 (Sanitation data for 1981 census is not available). The scatter plot of 1991 shows that the relation between two variables is strong than that of 2001. Both the graphs depict the trend of linear relationship.

### 5.3.2 Bivariate Correlation Coefficients of the Variables

To estimate the Bivariate Correlation Coefficients of the variables Pearson's Correlation is used here. With respect to level of urbanization (LOU) i.e. dependant variable the correlation coefficients of all independent variables are estimated for 1981, 1991 and 2001. The total number of independent variables in this study are nine and these are Rural-urban migration (RUM), Percentage of urban Land (PUL), Level of industrialization (LOIND), Percentage of non-agricultural activities (NAA), Literacy rate (LITER), Length of Paved Road (RDLEN), Electricity coverage (ELEC), Water supply coverage (WS) and Sanitation coverage (SANI). It is shown from the Tables 5.6, 5.7 and 5.8 that all the variables are not equally significant in the three decades or even in a single decade. Again a particular variable which is significant

in a particular year may become insignificant in another year. So, there is a changing importance of the variables from one decade to another.

Tables 5.6, 5.7 and 5.8 show the correlations between all the independent variables along with the dependant variable for 1981, 1991 and 2001 respectively. It is evident that all the variables are positively correlated with lend support in favour of the assumptions of this study. Now it can be clearly stated whether a particular variable is important or not and what is its importance relative to others.

***Bivariate Correlation Coefficients of the Variables for 1981:***

From Table 5.6 the relative importance of the variables affecting regional variation of urbanization in Bangladesh for the year 1981 is easily distinguishable. Water supply coverage has emerged as the most strongly correlated variable with coefficient 0.906. This has been followed by non-agricultural activities with coefficient 0.877. Again percentage of urban land which increases with the expansion of urban area is a principle cause of urbanization. It is also proved that percentage of urban land and level of urbanization is strongly correlated with a coefficient of 0.865. Among the other three variables level of industrialization (coefficient 0.754), literacy rate (coefficient 0.418) are weakly related and road length (coefficient 0 697) is moderately correlated with urbanization. It is also remarkable that all the independent variables are positively correlated with each other.

***Bivariate Correlation Coefficients of the Variables for 1991:***

The relative importance of the variables affecting regional variation of urbanization in Bangladesh for the year 1991 is easily distinguishable from Table 5.7. Similar to the year of 1981, water supply coverage has emerged as the most strongly correlated variable with coefficient 0.955. This has been followed by percentage of urban land with coefficient 0.924, electricity coverage with coefficient 0.921, sanitation coverage with coefficient 0.862 and non-agricultural activities with coefficient 0.850. The other variables- rural-urban migration (coefficient 0.536), level of industrialization (coefficient 0.636), literacy rate (coefficient 0.530) and road length (coefficient 0.513) are moderately correlated with urbanization and thus affects regional variation of urbanization. It is also remarkable that although rural-urban migration is believed as the number 1 influential factor of urbanization this study does not clarify this. The reason of the controversy is that most research works on migration in our country are centered on Dhaka city though there are another 520 urban centers all over the

country. Obviously, this claim is true for Dhaka mega city or Chittagong SMA but if we consider all the 522 urban centers and total rural-urban migration all together, it will discover that influence of migration on urbanization all over the country is not as high as was guessed. Moreover Table 5.7 depicts that all the independent variables are positively correlated with each other.

***Bivariate Correlation Coefficients of the Variables for 2001:***

The relative importance of the variables affecting regional variation of urbanization in Bangladesh for the year 2001 is evident in Table 5.8. Similar to the last two decades, water supply coverage has emerged as the most strongly correlated variable with coefficient 0.937. This has been followed by percentage of urban land with coefficient 0.929, non-agricultural activities with coefficient 0.862 and electricity coverage with coefficient 0.806. The other variables- level of industrialization (coefficient 0.773), sanitation coverage (coefficient 0.529) and literacy rate (coefficient 0.493) are moderately correlated with urbanization and thus affects regional variation of urbanization. Rest of the two variables- rural-urban migrations (coefficient 0.315) and road length (coefficient 0.391) are weakly correlated with urbanization. This result also substantially undermined the claim that rural-urban migration is the number 1 influential factor towards urbanizing our country. Table 5.8 also depicts that all the independent variables are positively correlated with each other.

Table 5 6: Bivariate Correlation Coefficients of the Independent Variables along with the Dependent Variable (1981)

| VARIABLES | | LOU | PUL | LOIND | NAA | LITER | RDLEN | WS |
|---|---|---|---|---|---|---|---|---|
| LOU | Pearson Correlation | 1 | .865(**) | 754(**) | .877(**) | .418 | .697(**) | .906(**) |
| | Sig. (2-tailed) | . | .000 | 000 | .000 | .066 | .001 | .000 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| PUL | Pearson Correlation | 865(**) | 1 | .638(**) | .857(**) | .270 | .669(**) | 751(**) |
| | Sig. (2-tailed) | .000 | . | .002 | .000 | .250 | .001 | 000 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| LOIND | Pearson Correlation | .754(**) | .638(**) | 1 | .871(**) | .455(*) | 757(**) | .808(**) |
| | Sig. (2-tailed) | .000 | .002 | . | 000 | 044 | 000 | 000 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| NAA | Pearson Correlation | .877(**) | 857(**) | .871(**) | 1 | .555(*) | .741(**) | .877(**) |
| | Sig. (2-tailed) | .000 | .000 | .000 | . | .011 | 000 | .000 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| LITER | Pearson Correlation | .418 | 270 | 455(*) | .555(*) | 1 | .434 | .521(*) |
| | Sig. (2-tailed) | .066 | .250 | .044 | .011 | . | .056 | .019 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| RDLEN | Pearson Correlation | .697(**) | .669(**) | .757(**) | .741(**) | .434 | 1 | 770(**) |
| | Sig. (2-tailed) | 001 | .001 | .000 | .000 | .056 | . | 000 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| WS | Pearson Correlation | .906(**) | .751(**) | .808(**) | .877(**) | 521(*) | .770(**) | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .019 | .000 | . |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 |

** Correlation is significant at the 0 01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed).

Table 5.7: Bivariate Correlation Coefficients of the Independent Variables along with the Dependent Variable (1991)

Statistical analysis is performed with N = 20

| VARIABLE | | LOU | RUM | PUL | LOIND | NAA | LITER | RDLEN | WS | ELEC | SANI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LOU | Pearson Correlation | 1 | 536(*) | 924(**) | .636(**) | .850(**) | .530(*) | .513(*) | .955(**) | .921(**) | .862(**) |
| | Sig. (2-tailed) | | .015 | 000 | .003 | .000 | .016 | .021 | 000 | 000 | .000 |
| RUM | Pearson Correlation | 536(*) | 1 | 596(**) | 572(**) | .675(**) | .473(*) | .234 | .448(*) | .595(**) | .574(**) |
| | Sig. (2-tailed) | .015 | | 006 | .008 | .001 | .035 | .321 | .048 | .006 | .008 |
| PUL | Pearson Correlation | .924(**) | .596(**) | 1 | .690(**) | .780(**) | .426 | .476(*) | .920(**) | 924(**) | 804(**) |
| | Sig. (2-tailed) | .000 | .006 | . | .001 | .000 | .061 | .034 | .000 | .000 | .000 |
| LOIND | Pearson Correlation | 636(**) | 572(**) | .690(**) | 1 | .694(**) | .239 | .235 | .608(**) | 738(**) | .635(**) |
| | Sig. (2-tailed) | .003 | .008 | .001 | . | .001 | .311 | .318 | .004 | 000 | 003 |
| NAA | Pearson Correlation | .850(**) | .675(**) | .780(**) | .694(**) | 1 | .736(**) | .334 | .832(**) | .843(**) | .877(**) |
| | Sig. (2-tailed) | .000 | .001 | .000 | .001 | . | .000 | .150 | .000 | .000 | .000 |
| LITER | Pearson Correlation | .530(*) | .473(*) | .426 | .239 | .736(**) | 1 | .154 | .580(**) | .515(*) | .697(**) |
| | Sig. (2-tailed) | 016 | .035 | .061 | .311 | 000 | . | .517 | .007 | .020 | .001 |
| RDLEN | Pearson Correlation | .513(*) | .234 | .476(*) | .235 | 334 | 154 | 1 | .497(*) | .499(*) | .537(*) |
| | Sig. (2-tailed) | .021 | .321 | .034 | .318 | .150 | 517 | . | .026 | .025 | .015 |
| WS | Pearson Correlation | .955(**) | .448(*) | .920(**) | 608(**) | 832(**) | 580(**) | .497(*) | 1 | .920(**) | .891(**) |
| | Sig. (2-tailed) | 000 | .048 | .000 | .004 | .000 | 007 | 026 | . | .000 | .000 |
| ELEC | Pearson Correlation | .921(**) | .595(**) | .924(**) | .738(**) | .843(**) | .515(*) | 499(*) | 920(**) | 1 | .931(**) |
| | Sig. (2-tailed) | 000 | .006 | .000 | .000 | .000 | 020 | .025 | 000 | | .000 |
| SANI | Pearson Correlation | .862(**) | .574(**) | 804(**) | 635(**) | .877(**) | .697(**) | .537(*) | .891(**) | 931(**) | 1 |
| | Sig. (2-tailed) | 000 | .008 | .000 | .003 | .000 | .001 | .015 | .000 | .000 | . |

* Correlation is significant at the 0 05 level (2-tailed).

** Correlation is significant at the 0 01 level (2-tailed)

Table 5.8: Bivariate Correlation Coefficients of the Independent Variables along with the Dependent Variable (2001)

Statistical analysis is performed with N = 20

| VARIABLE | | LOU | RUM | PUL | LOIND | NAA | LITER | RDLEN | WS | ELEC | SANI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LOU | Pearson Correlation | 1 | 315 | .930(**) | .773(**) | .862(**) | .493(*) | .391 | .937(**) | .806(**) | .529(*) |
| | Sig. (2-tailed) | . | .176 | .000 | 000 | 000 | 027 | .088 | .000 | 000 | .016 |
| RUM | Pearson Correlation | .315 | 1 | 216 | 174 | 147 | 101 | .121 | .285 | .176 | .121 |
| | Sig. (2-tailed) | 176 | . | .360 | .463 | .536 | .672 | 612 | .224 | 458 | 611 |
| PUL | Pearson Correlation | .930(**) | .216 | 1 | .746(**) | .802(**) | .337 | 422 | 897(**) | .809(**) | .469(*) |
| | Sig. (2-tailed) | .000 | .360 | | .000 | .000 | .146 | .064 | .000 | .000 | .037 |
| LOIND | Pearson Correlation | 773(**) | .174 | .746(**) | 1 | .802(**) | .418 | 138 | 808(**) | .847(**) | .569(**) |
| | Sig. (2-tailed) | .000 | .463 | .000 | | .000 | .067 | .562 | .000 | .000 | .009 |
| NAA | Pearson Correlation | .862(**) | .147 | .802(**) | .802(**) | 1 | .633(**) | .457(*) | 845(**) | .857(**) | .793(**) |
| | Sig. (2-tailed) | .000 | .536 | .000 | .000 | . | .003 | .043 | .000 | .000 | .000 |
| LITER | Pearson Correlation | .493(*) | .101 | .337 | .418 | .633(**) | 1 | .255 | .513(*) | .576(**) | .717(**) |
| | Sig. (2-tailed) | 027 | .672 | .146 | .067 | .003 | . | .279 | .021 | .008 | .000 |
| RDLEN | Pearson Correlation | .391 | .121 | .422 | .138 | .457(*) | .255 | 1 | .380 | .339 | .357 |
| | Sig. (2-tailed) | .088 | .612 | .064 | .562 | .043 | .279 | . | .098 | .144 | .122 |
| WS | Pearson Correlation | .937(**) | .285 | 897(**) | 808(**) | .845(**) | .513(*) | .380 | 1 | .853(**) | 609(**) |
| | Sig. (2-tailed) | .000 | .224 | 000 | .000 | .000 | .021 | .098 | | 000 | 004 |
| ELEC | Pearson Correlation | .806(**) | .176 | .809(**) | .847(**) | .857(**) | .576(**) | .339 | .853(**) | 1 | .792(**) |
| | Sig. (2-tailed) | .000 | .458 | .000 | .000 | .000 | 008 | .144 | .000 | . | .000 |
| SANI | Pearson Correlation | .529(*) | 121 | .469(*) | 569(**) | .793(**) | .717(**) | .357 | 609(**) | .792(**) | 1 |
| | Sig. (2-tailed) | .016 | .611 | .037 | .009 | .000 | .000 | 122 | 004 | .000 | . |

** Correlation is significant at the 0 01 level (2-tailed), * Correlation is significant at the 0 05 level (2-tailed)

### 5.3.3 Comparison of Correlation Coefficients

Table 5.9 is a summary Table of the Tables 5.6, 5.7 and 5.8 and from this we can easily distinguish the relative and changing importance of the variables affecting regional variation of urbanization in Bangladesh. Here a comparison of the correlation coefficients of all the independent variables with level of urbanization (LOU) is shown for the three consecutive censuses 1981, 1991 and 2001.

Among the six variables taken in 1981 five were found significant in explaining the research objectives. Again the total number of variables for both 1991 and 2001 were nine and of them respectively nine and six lend support in favor of our claim.

Table 5.9: Comparison of Correlation Coefficients of the Variables (1981-2001)

| Correlation Between | Correlation Coefficient | | |
|---|---|---|---|
| | 1981 | 1991 | 2001 |
| LOU-NAA | 0.877 | 0.850 | 0.862 |
| LOU-LOIND | 0.755 | 0.636 | 0.773 |
| LOU-WS | 0.906 | 0.955 | 0.937 |
| LOU-SANI | - | 0.862 | 0.529 |
| LOU-ELEC | - | 0.921 | 0.806 |
| LOU-LITER | 0.418 | 0.530 | 0.493 |
| LOU-PUL | 0.865 | 0.924 | 0.930 |
| LOU-RUM | - | 0.536 | 0.315 |
| LOU-RDLEN | 0.697 | 0.513 | 0.391 |

- Data unavailable

From Table 5.9 it can be clearly stated that whether a factor is significant or not and whether its significance varies from one decade to another or not.

Water supply coverage has emerged as the most strongly related factor with coefficient 0.906, 0.955 and 0.937 in the year 1981, 1991 and 2001 respectively. This research has taken into account the tap water supply coverage and in Bangladesh it is mostly available in metropolitan and municipal areas which accommodate significant portion of urban population.

Percentage of urban land is another variable which is closely associated with level of urbanization. The coefficients of this variable are 0.865, 0.924 and 0.930 respectively for 1981, 1991 and 2001. In another study Rouf (1999) showed that share of urban area was

related with coefficient 0.90. Percentage of urban land is directly related to the expansion of urban area, which seems to become a routine function in Bangladesh. From megacity to tiny urban agglomerations, all are expanding from time to time and giving rise to rapid urbanization (Rouf, 1991).

Electricity coverage has emerged as the most influential factor with coefficient of correlation 0.921 and 0.806 respectively in 1991 and 2001. The availability of electricity connection is a criterion of urban area.

Non-agricultural activity is another most significant variable affecting regional variation of urbanization. In all the three years 1981, 1991 and 2001 it is moderately associated with coefficients 0.877, 0.850 and 0.862 respectively. In Bangladesh it is a criterion of urban area that majority of male working population engaged in non-agricultural pursuits. This study result lends support in favor of this.

Level of industrialization is another potent factor affecting regional variation of urbanization with coefficient of correlations 0.755, 0.636 and 0.773 for 1981, 1991 and 2001 respectively. Industrialization is a factor of migration and migration is one of the major causes of urbanization. In another study by Rouf (1999) the correlation coefficient of level of industrialization with level of urbanization was found 0.74. Thus level of industrialization is linked with level of urbanization and this study also proved it.

Sanitation coverage is another influential variable affecting regional variation of urbanization. It was related with coefficients of correlation 0.862 and 0.529 in the year 1991 and 2001 respectively.

Road length i e. availability of paved road is moderately related with coefficients 0.697 and 0.513 for the year 1981 and 1991 correspondingly. But in 2001 it was found insignificant.

It is assumed that rural-urban migration is the most dominant factor influencing regional variation of urbanization. Obviously in large cities like Dhaka, migration has a great influence on urbanization. But it is proved from this study that influence of migration on urbanization all over the country is not as high as was assumed and it is found that in 1991 rural-urban migration is related with coefficient 0.536. In another study by Rouf (1999) it

was found 0.58. The relation between migration and urbanization found insignificant in 2001. Another variable literacy rate was insignificant in 1981 and 2001. In 1991 it was related with coefficient 0.530.

So, it is evident that a particular variable is not equally significant in all over the three decades. i.e. their importance varies from census to census.

# CHAPTER 6
# SUMMARY AND CONCLUSIONS

## 6.1 Introduction

The study was designed towards understanding the trend of urbanization in Bangladesh in the last three census years i.e. 1981, 1991 and 2001 with their spatial, temporal and spatio-temporal variations. The nature of urbanization at different hierarchies of urban centers was examined in this study. Besides these the factors affecting regional variation of urbanization were analyzed using quantitative techniques with a view to learning how much and to what extent they are contributing to regional variations of urbanization. The relative and changing importance of these factors in this regard were analyzed for three consecutive censuses of 1981, 1991 and 2001.

## 6.2 Summary Findings

It is tried here to summarize the main findings of this study:

**National Aspects of Urbanization:**

- The level of urbanization showed an upward trend during 1981-2001 in Bangladesh, which is reflected in every region.
- The level of urbanization as measured by the proportion of total population living in urban areas was 15.50 percent in 1981, which increased to 19.71 percent in 1991 and further rose to 23.53 percent in 2001. It implies that urbanization in Bangladesh is increasing but at a decreasing rate.
- Annual average growth rate (AAGR) of urban population was much greater than the growth rate of national population. In 1991, AAGR of urban population was 4.31% whereas the AAGR of national population was 1.91%. Again in 2001 these figures were 3.38 percent and 1.61 percent for urban and national population respectively.
- The intercensal variation of urban population in Bangladesh was high which was 53.90 percent during 1981-1991 and 40.17 percent during 1991-2001. It shows that the percentage of variation is high but it is slightly decreasing.
- Territorial extension of existing urban areas and a change in the definition of urban areas is a very important cause of urbanization in Bangladesh. From 1981 to 1991 in Bangladesh the share of national urban land (SNUL) increased rapidly from 3.59% to 6.49%. Again in 2001, it rose to 7.43%. In 1981 the share of national urban land

(SNUL) was highest in Chittagong (16.41%); this position was occupied by Dhaka both in 1991 and 2001 with share of 16.84% and 15.19% respectively.

The table below shows the above mentioned aspects at a glance:

| Particulars | 1981 | 1991 | 2001 |
|---|---|---|---|
| » Level of Urbanization (%) | 15.50 | 19.71 | 23.53 |
| » Annual Average Growth Rate of National Population (%) | 2.83 | 1.91 | 1.67 |
| » Annual Average Growth Rate of Urban Population (%) | 10.66 | 5.06 | 2.97 |
| » Intercensal Variation of Urban Population (%) | 110.85 | 53.90 | 40.17 |
| » Share of Urban land (%) | 3.59 | 6.49 | 7.41 |

**Regional Aspects of Urbanization:**

- The regional trend of level of urbanization was not uniform throughout Bangladesh in the years 1981, 1991 and 2001. There existed remarkable spatial, temporal and spatio-temporal variations in the level of urbanization in Bangladesh. These variations regarding level of urbanization were found at the divisional, regional and other levels.
- Dhaka region emerged as the highest urbanized region in the last three consecutive censuses which was followed by Chittagong, Hill Tracts and Khulna in descending order over the study period. It is interesting to note that four regions Dhaka, Chittagong, Hill Tracts and Khulna have never changed their ranks throughout the three decades. This is indicative of regional primacy.
- In 1981 there were eight low urbanized (level of urbanization up to 10%) regions and in 1991 this number declined to four consisting Tangail, Faridpur, Comilla and Patuakhali regions. It is remarkable that in 2001 there was no region with level of urbanization less than 10 percent.
- With the upward trend of urbanization the density of urban population also increased very rapidly in all the regions. Dhaka had the highest density since 1981 which is followed by Chittagong. The density of urban population is the lowest in Hill Tracts region in all of the three censuses because of its vast urban land (773.3 sq. km) and low urban population.
- There is a fluctuating tendency in case of share of national urban population (SNUP) for each of the regions from census to census. Like other aspects Dhaka region held the highest share with 28.70%, 34.20% and 36.02% respectively in 1981, 1991 and

2001. Except Dhaka SNUP was higher in Chittagong, Khulna and Rajshahi regions. It was lowest in Jamalpur, Tangail, Hill-Tracts, Patuakhali and Bogra region over the three decades.

Some regional aspects are given here in the table below:

| Particulars | 1981 | 1991 | 2001 |
|---|---|---|---|
| » Range of Regional Level of Urbanization (%) | 7.44-38.94 | 8.64-53.94 | 11.38-61.30 |
| » *No. of Regions with Level of Urbanization:* | | | |
| (i) Up to 10% | 8 | 4 | 0 |
| (ii) 10.01-20% | 8 | 12 | 15 |
| (iii) Above 20% | 4 | 4 | 5 |

**Aspects Related to Urban Centers:**

- In this country urban population is concentrated in a handful of urban centers. In 2001, 50.46 percent of total urban population was concentrated in Dhaka mega city Chittagong. Khulna and Rajshahi Statistical Metropolitan Areas.
- The urban hierarchy changes over time which is revealed from table 4.12 of this study. The win-loss game of city ranking is indicative of unstable economic growth and lack of urban policy. The urban expansion has occurred only in terms of population size, devoid of urban facilities, let alone urbanism.
- The number of urban centers increased from 492 in 1981 to 522 in 1991and to 536 in 2001. Cities with more than 100000 populations increased from 9 in 1981 to 18 in 1991 and to 21 in 2001.

Some particulars of urbanization related to urban centers are given below:

| Particulars | 1981 | 1991 | 2001 |
|---|---|---|---|
| » No. of Urban Centers | 492 | 522 | 536 |
| » No. of Municipalities | 71 | 107 | 223 |
| » Percentage of Population residing in municipalities | 58.97 | 56.97 | 68.33 |
| » Percentage of Population in mega city and SMA's | 42.22 | 47.89 | 50.46 |
| » *Population Density* | | | |
| • Dhaka Mega city | 8558 | 4795 | 7054 |
| • Chittagong SMA | 1992 | 2109 | 3125 |
| • Khulna SMA | 8709 | 3445 | 4386 |
| • Rajshahi SMA | 2949 | 1346 | 1727 |
| » No. of cities with more than 100,000 Population | 9 | 18 | 21 |

**Inequality in Distribution of Urban Population:**

- As over fifty percent of the urban population lived in the four metropolitan areas (Dhaka, Chittagong, Khulna and Rajshahi) it implied that the distribution of urban population in this country is highly skewed. This fact became easily understandable by comparing the Gini-coefficients of distribution of urban population among the twenty regions in 1981, 1991 and 2001.

| Census Year | Gini-coefficient |
|---|---|
| 1981 | 0.314 |
| 1991 | 0.354 |
| 2001 | 0.340 |

- These values indicate that the urban population distribution is unequal in the regions of Bangladesh. It is seen that there lies negligible difference between these three values which indicates that the urban population distribution is unequal over the three years. From 1991 to 2001 this inequality slightly decreased but still more than the census year 1981.

**Relative and Changing Importance of the Factors Affecting Urbanization:**

- The study showed that all the independent variables viz. rural-urban migration, percentage of urban land, level of industrialization, percentage of non-agricultural activities, literacy rate, length of paved road, electricity coverage, water supply coverage and sanitation coverage are positively correlated with dependent variable level of urbanization.

The table below shows the correlation coefficients of the variables with level of urbanization in the three census years.

| Variables | Correlation Coefficient | | |
|---|---|---|---|
| | 1981 | 1991 | 2001 |
| Non-agricultural Activities | 0.877 | 0.850 | 0.862 |
| Level of Industrialization | 0.755 | 0.636 | 0.773 |
| Water Supply Coverage | 0.906 | 0.955 | 0.937 |
| Sanitation Coverage | - | 0.862 | 0.529 |
| Electricity Coverage | - | 0.921 | 0.806 |
| Literacy Rate | 0.418 | 0.530 | 0.493 |
| Percentage of Urban Land | 0.865 | 0.924 | 0.930 |
| Rural-Urban Migration | - | 0.536 | 0.315 |
| Road Length | 0.697 | 0.513 | 0.391 |

- The importance of the variables affecting regional variation of urbanization changed in the three census years 1981, 1991 and 2001. Water supply coverage has emerged as the most strongly related factor with coefficient 0.906, 0.955 and 0.937 in the year 1981, 1991 and 2001 respectively. The coefficients of percentage of urban land are 0.865, 0.924 and 0.930 in 1981, 1991 and 2001 respectively. Electricity coverage has emerged as the most influential factor with coefficient of correlation 0.921 and 0.806 respectively in 1991 and 2001. Non-agricultural activities are moderately associated with coefficients 0.877, 0.850 and 0.862 in the successive census years. Level of industrialization is related with level of urbanization with coefficients of correlation 0.755, 0.636 and 0.773 for 1981, 1991 and 2001 respectively. Sanitation coverage is related with coefficients of correlation 0.862 and 0.529 in the year 1991 and 2001 respectively. Road length is related with coefficients 0.697 and 0.513 for the year 1981 and 1991 correspondingly. But in 2001 it was found insignificant. The influence of migration was not so high all over the country. In 1991 and 2001 the coefficients were found 0.536 and 0.315 respectively. Another variable literacy rate was insignificant in 1981 and 2001. In 1991 it was related with coefficient 0.530.

The Figure 6.1 shows the causes of regional variation found from this study.

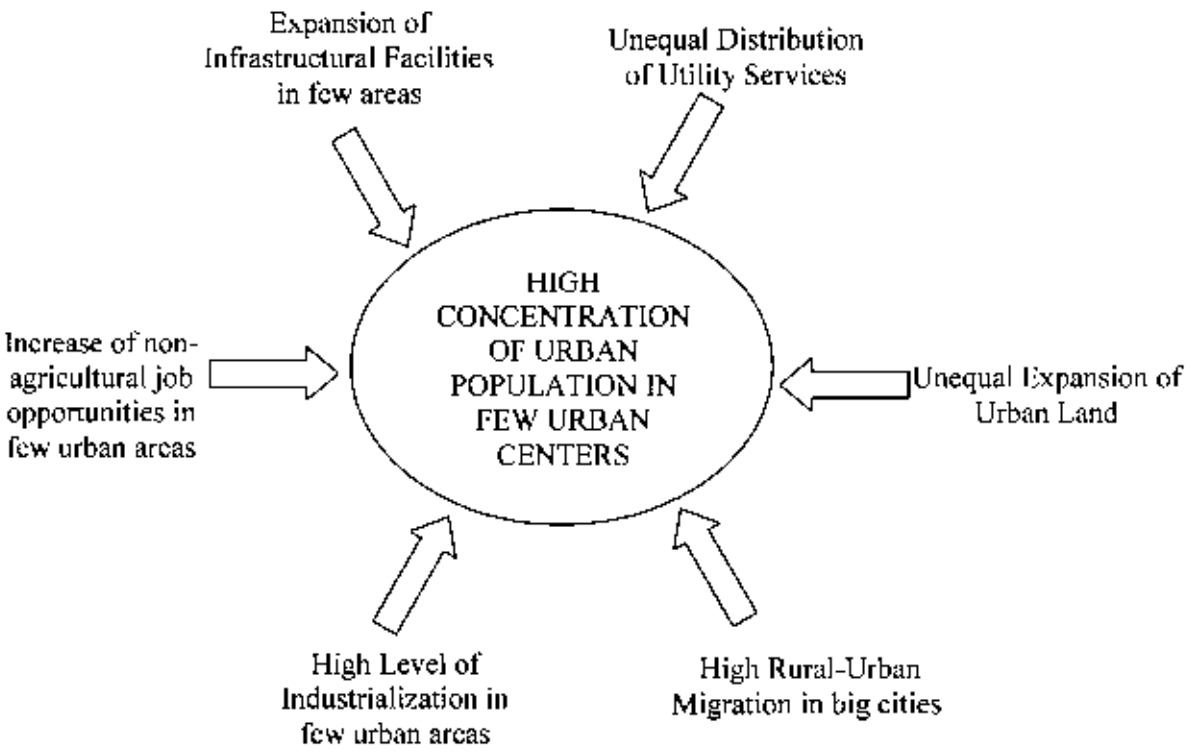



Figure 6.1: Causes of Regional Disparity in Urbanization

## 6.2 Recommendations:

The regional inequalities are accentuated when localities grow at the expense of other regions which are stagnant, therefore, some policies should be taken to lessen the inequalities. Here some recommendations are given on the basis of research findings:

- Effective measures should be taken to raise the level of urbanization in the less urbanized regions such as Patuakhali, Faridpur, Dinajpur, etc.
- To reduce the spatial disparity of urbanization Government should take initiative to redistribute and relocate various types of establishments and institutions from large urban centers to medium or smaller urban centers. For example, the garment factories should be shifted from the main city of Dhaka.
- It is found from this study that level of industrialization is a significant variable affecting regional variation of urbanization. So, new industries as far as possible should be established away from large and congested areas. It will also help to reduce migration towards the large cities which is another reason of regional disparity in urbanization. Hence, the creation of employment opportunities in rural areas is the chief weapon to regulate the pace of rural-urban migration.
- It is found that above fifty percent of urban population is concentrated in only four higher-order urban centers. As a result a large number of urban centers are not full-fledged in Bangladesh. To overcome this problem emphasis should be given to the provision and development of various infrastructure and services such as water supply, electricity, sanitation, roads etc. in the small and medium sized urban centers.
- To reduce the concentration of population from few large urban centers measures should be taken so that smallest urban centers (may be urban growth centers) grow rapidly and the largest ones either grow slowly or preferably stop growing e.g Dhaka mega city. In this regard taxation policy can play a vital role.
- To reduce the density of population from metropolitan areas efforts should be made to set up more satellite towns and transport facilities should be improved between the metropolitan cities and the satellite towns.

- As percentage of urban land is strongly correlated with level of urbanization so as far as possible in each region the percentage of urban land should be made equal.
- While the cities are absorbing huge number of population every year they do so in a policy vacuum. There is no explicit urbanization policy in Bangladesh Various documents allude to some policy measures but in a somewhat uncoordinated manner. Finally a comprehensive urbanization policy should be formulated with policies for population, for balanced development and improvement of urban areas as major components.
- Rapid urbanization and population growth in Bangladesh have caused vastly increased demand for urban infrastructure and municipal services but the capabilities of urban local bodies to provide urban services and maintain healthy urban environment have not grown in tandem with the pace of urbanization. In particular, their institutional capacity to plan and manage provision of urban services in an efficient and accountable manner, availability of resources to render the services, the legal and regulatory regimes and the level of autonomy in making decisions have been inadequate. Urbanization has played a major role in Bangladesh's strong growth performance and a well planned and decentralized urbanization has considerable poverty reducing potential However, unplanned urbanization, through creating pressure on basic urban services, ultimately limits the growth potential of the economy. Planned urban development with particular focus on adequate provision of urban municipal services is essential to improve the quality of life in the urban areas and for exploiting the growth potential of the urban areas in a sustainable manner. The Government should understand and confirm the need for managing the urbanization process in a balanced and coordinated manner and strengthened urban local governments to address the growing needs for urban municipal services.

## 6.4 Conclusion:

Bangladesh is still an agrarian society though nearly one quarter of its population lives in the urban areas. As urbanization is an indicator of development, it increases with the socio-economic development of the country. As in Bangladesh the higher level of urbanization is concentrated in few regions and these regions face problems due to high population density. It is a crucial need to decrease regional variation in urbanization to supply the utility and community facilities to its inhabitants. Again the pressure on urban land increases the land value which makes most people unable to afford land/house for better living. Consequently slums & squatter settlements are rapidly growing in the large cities. Massive urbanization in a poor economy like that of Bangladesh is liable to exacerbate the already created problems of poverty, inequity in resource distribution, environmental hazards, crimes, severe congestions, public health problems, etc. However, urbanization is a normal process of development activities & big cities can play a positive role in it. The point at issue is the regional variation of urbanization resulting uncontrolled growth of urban population in big cities which needs urgent attention. Above all adoption and implementation of a comprehensive urbanization policy and improvement of urban management within a local government system are essential for a sustainable future of the country.

## 6.5 Scope for Further Research:

This study attempted to utilize the limited data available to provide some insights into the recent trend of urbanization in Bangladesh explore regional variations and analyze the factors affecting this variation. Thus it provides a basis for comparative insights for follow-up researches.

The present study included only some socio-economic and infrastructural factors. But there are others factors of urbanization such as demographic, geo-environmental, behavioral and others which deserve to be incorporated. There is a scope to utilize dummy variable in further research on urbanization. So in future detail research work in broader extent is recommended including these factors and variables.

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# APPENDIX A

| Regions | Total Area (sq. km) | 1981 | | | 1991 | | | 2001 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Total pop$^n$ | Urban Pop$^n$ | Urban Area (sq.km) | Total pop$^n$ | Urban Pop$^n$ | Urban Area (sq.km) | Total pop$^n$ | Urban Pop$^n$ | Urban Area (sq.km) |
| Dhaka | 7440 | 10013733 | 3899702 | 630 48 | 13232427 | 7137518 | 1613.11 | 17192103 | 10539327 | 1665.65 |
| Mymensingh | 9862 | 6979400 | 717576 | 268 2 | 7583270 | 929531 | 454.67 | 9072868 | 1205111 | 544.97 |
| Jamalpur | 3396 | 2451719 | 223160 | 85 4 | 3013069 | 320590 | 153.64 | 3386751 | 467435 | 200.41 |
| Tangail | 3414 | 2442607 | 184781 | 84.1 | 3002428 | 281542 | 143.09 | 3290696 | 438011 | 160.93 |
| Faridpur | 7009 | 4761938 | 408584 | 159 1 | 5423847 | 468636 | 277.42 | 6102298 | 714636 | 388.83 |
| Chittagong | 7775 | 5491330 | 1761779 | 870.4 | 6715387 | 2599931 | 1256.65 | 8385849 | 3654118 | 1378 8 |
| Hill-Tracts | 13295 | 751692 | 216512 | 773.3 | 974445 | 324315 | 1201 37 | 1331966 | 433989 | 1483.75 |
| Comilla | 6716 | 6881002 | 585703 | 156.6 | 8206860 | 811868 | 293 32 | 9265040 | 1185575 | 421 24 |
| Noakhali | 5985 | 3816020 | 429891 | 188 3 | 4625767 | 509542 | 302 12 | 5307529 | 748968 | 329.44 |
| Sylhet | 12596 | 5655543 | 493060 | 210 3 | 6765039 | 681759 | 337.37 | 7939343 | 987538 | 417.73 |
| Khulna | 12211 | 4329314 | 974314 | 295 33 | 5039153 | 1328654 | 528.71 | 5792706 | 1662376 | 540.37 |
| Jessore | 6567 | 4019993 | 440729 | 187 | 4848023 | 575254 | 363.86 | 5573802 | 822375 | 387.91 |
| Kushtia | 3494 | 2291997 | 322326 | 187 6 | 2801207 | 419881 | 281.57 | 3338721 | 557913 | 316.05 |
| Barisal | 8245 | 4666734 | 564840 | 291.6 | 5413078 | 735734 | 356.19 | 5864383 | 899909 | 407 2 |
| Patuakhali | 5052 | 1842847 | 165246 | 76.8 | 2049585 | 199618 | 153.08 | 2309335 | 262866 | 192 47 |
| Rajshahi | 9442 | 5270141 | 571666 | 215.9 | 6594298 | 1126013 | 683 27 | 7624887 | 1527114 | 769.04 |
| Pabna | 4870 | 3423704 | 404520 | 148 | 4183469 | 592172 | 275 39 | 4870084 | 770643 | 325 46 |
| Bogra | 3885 | 2727973 | 203009 | 76.4 | 3434298 | 374169 | 125 69 | 3859752 | 510374 | 142 15 |
| Rangpur | 9665 | 6510050 | 735455 | 274 35 | 8014876 | 1014107 | 528.26 | 9153728 | 1307612 | 614.34 |
| Dinajpur | 6653 | 3200325 | 283732 | 123 4 | 3983103 | 441340 | 248 12 | 4693422 | 560702 | 280.82 |

Source: Zila Series of Population Census 1981, 1991 and 2001

# APPENDIX B

## Calculation of Gini Coefficient for 1981

| Regions | % of national pop | % share of national urb pop | Cumulative % of SNUP | Paired Sums | Twice the Trapezoid areas |
|---|---|---|---|---|---|
| | b | c | a+c | a+(a+c) | b{a+(a+c)} |
| Bogra | 3.12 | 1 50 | 1.497 | 1 497 | 4.665 |
| Tangail | 2.79 | 1 36 | 2.859 | 4 356 | 12 156 |
| Comilla | 7.86 | 4.32 | 7.178 | 10.037 | 78 907 |
| Faridpur | 5.44 | 3 01 | 10.190 | 17 368 | 94.491 |
| Sylhet | 6.46 | 3.64 | 13 826 | 24.016 | 155.179 |
| Dinajpur | 3 66 | 2.09 | 15.918 | 29.744 | 108.754 |
| Patuakhali | 2 11 | 1.22 | 17 136 | 33.054 | 69.594 |
| Jamalpur | 2.80 | 1.65 | 18.782 | 35.918 | 100.609 |
| Mymensingh | 7 97 | 5.29 | 24.073 | 42.854 | 341 716 |
| Rajshahi | 6.02 | 4 22 | 28.288 | 52 360 | 315.266 |
| Jessore | 4.59 | 3.25 | 31.537 | 59.825 | 274 764 |
| Noakhali | 4.36 | 3.17 | 34 707 | 66 244 | 288.810 |
| Rangpur | 7.44 | 5 42 | 40 130 | 74.837 | 556 611 |
| Pabna | 3 91 | 2.98 | 43.112 | 83.242 | 325.605 |
| Barisal | 5 33 | 4.16 | 47 277 | 90.389 | 481.929 |
| Kushtia | 2.62 | 2.38 | 49.654 | 96.931 | 253.821 |
| Khulna | 4 95 | 7.18 | 56.838 | 106 491 | 526.727 |
| Hill-Tracts | 0.86 | 1.60 | 58.434 | 115 271 | 98 995 |
| Chittagong | 6.27 | 12 81 | 71.246 | 129.680 | 813 588 |
| Dhaka | 11 44 | 28.75 | 100.000 | 171 246 | 1959.162 |
| **Total:** | **100.00** | **100.00** | | | **6861.349** |

$$\text{Gini-Coefficient, } G = \frac{10000 - \Sigma\, b\{a+(a+c)\}}{10000}$$

$$= \frac{10000 - 6861.349}{10000}$$

$$= 0.314$$

## Calculation of Gini Coefficient for 1991

| Regions | % of national pop$^n$ | % share of national urban pop$^n$ | Cumulative % of SNUP | Paired Sums | Twice the Trapezoid areas |
|---|---|---|---|---|---|
| | b | c | A+c | a+(a+c) | b{a+(a+c)} |
| Faridpur | 5.12 | 2.250 | 2.250 | 2 250 | 11 523 |
| Tangail | 2.84 | 1.349 | 3.599 | 5.849 | 16 582 |
| Patuakhali | 1.94 | 0 956 | 4.555 | 8 154 | 15.781 |
| Comilla | 7 75 | 3 890 | 8.445 | 13.000 | 100 744 |
| Sylhet | 6 39 | 3.266 | 11 711 | 20.156 | 128.757 |
| Jamalpur | 2.85 | 1.536 | 13.247 | 24 959 | 71.010 |
| Bogra | 3 24 | 1.793 | 15 040 | 28 287 | 91.731 |
| Noakhali | 4.37 | 2.441 | 17.481 | 32 521 | 142.049 |
| Dinajpur | 3.76 | 2.114 | 19.596 | 37 077 | 139.449 |
| Jessore | 4.58 | 2.756 | 22.352 | 41.948 | 192 026 |
| Mymensingh | 7.16 | 4 453 | 26.805 | 49.157 | 351.991 |
| Rangpur | 7.57 | 4 859 | 31.664 | 58.469 | 442 499 |
| Barisal | 5 11 | 3.525 | 35.189 | 66.853 | 341 706 |
| Pabna | 3.95 | 2 837 | 38.026 | 73.215 | 289.218 |
| Kushtia | 2.65 | 2.012 | 40.038 | 78.064 | 206.483 |
| Rajshahi | 6.23 | 5.395 | 45.432 | 85 470 | 532.197 |
| Khulna | 4.76 | 6.366 | 51 798 | 97.231 | 462.647 |
| Hill-Tracts | 0.92 | 1.554 | 53.352 | 105 150 | 96.751 |
| Chittagong | 6.34 | 12.456 | 65.808 | 119.160 | 755 600 |
| Dhaka | 12.49 | 34 196 | 100.000 | 165.808 | 2071.740 |
| **Total:** | **100.00** | **100.000** | | | **6460.485** |

$$\text{Gini-Coefficient, } G = \frac{10000 - \Sigma\, b\{a+(a+c)\}}{10000}$$

$$= \frac{10000 - 6460\ 485}{10000}$$

$$= 0.354$$

## Calculation of Gini Coefficient for 2001

| Regions | % of national pop$^n$ | % share of national urban pop$^n$ | Cumulative % of SNUP | Paired Sums | Twice the Trapezoid areas |
|---|---|---|---|---|---|
| | b | c | a+c | a+(a+c) | b{a+(a+c)} |
| Patuakhali | 1.86 | 0.900 | 0 900 | 0.900 | 1.671 |
| Faridpur | 4.91 | 2 443 | 3 343 | 4.243 | 20 819 |
| Dinajpur | 3 77 | 1.916 | 5.259 | 8.602 | 32 465 |
| Sylhet | 6 38 | 3.375 | 8 635 | 13 894 | 88.703 |
| Comilla | 7.45 | 4.052 | 12 687 | 21.322 | 158.855 |
| Bogra | 3 10 | 1.744 | 14.431 | 27 118 | 84 170 |
| Mymensingh | 7.30 | 4 119 | 18.551 | 32.982 | 240.633 |
| Tangail | 2 65 | 1 497 | 20.048 | 38.598 | 102.139 |
| Jamalpur | 2.72 | 1.598 | 21.645 | 41.693 | 113.549 |
| Noakhali | 4.27 | 2 560 | 24.205 | 45.851 | 195.692 |
| Rangpur | 7.36 | 4.469 | 28.675 | 52.880 | 389.248 |
| Jessore | 4.48 | 2 811 | 31.486 | 60.161 | 269.649 |
| Barisal | 4.72 | 3.076 | 34 562 | 66.047 | 311.468 |
| Pabna | 3.92 | 2.634 | 37.196 | 71.757 | 281 021 |
| Kushtia | 2.68 | 1 907 | 39 103 | 76 298 | 204.848 |
| Rajshahi | 6 13 | 5.220 | 44 322 | 83 425 | 511.524 |
| Khulna | 4 66 | 5.682 | 50.004 | 94.327 | 439 393 |
| Hill-Tracts | 1.07 | 1.483 | 51 488 | 101 492 | 108.708 |
| Chittagong | 6 74 | 12.490 | 63.978 | 115.466 | 778 638 |
| Dhaka | 13.82 | 36.024 | 100.000 | 163 978 | 2266.991 |
| **Total:** | **100.00** | **100.000** | | | **6600.184** |

$$\text{Gini-coefficient, } G = \frac{10000 - \Sigma\, b\{a+(a+c)\}}{10000}$$

$$= \frac{10000 - 6600\ 184}{10000}$$

$$= 0.340$$

## APPENDIX C

**Degree of relationship between urbanization and factors affecting regional variation**

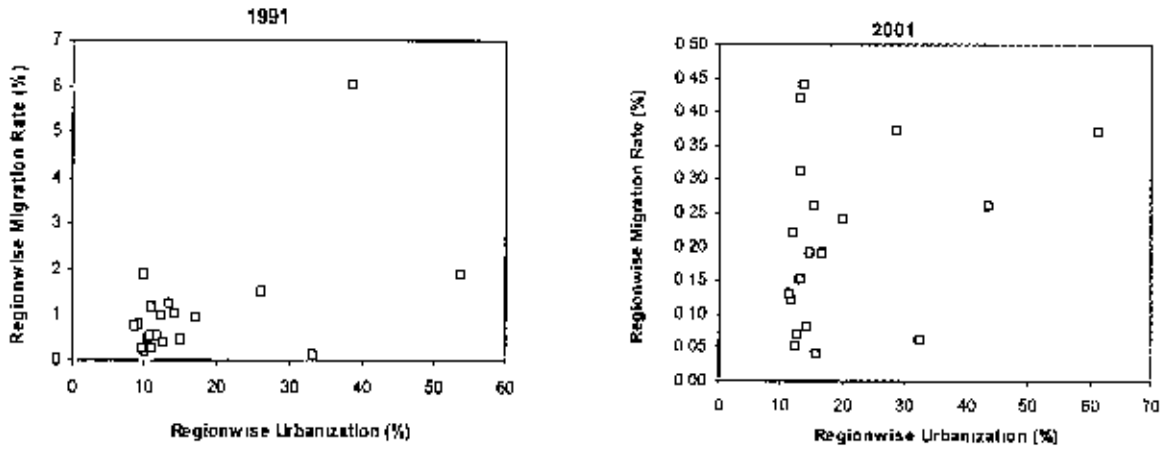


Figure C-1: Scatter plot of region wise urbanization and rural-urban migration (1991-2001)

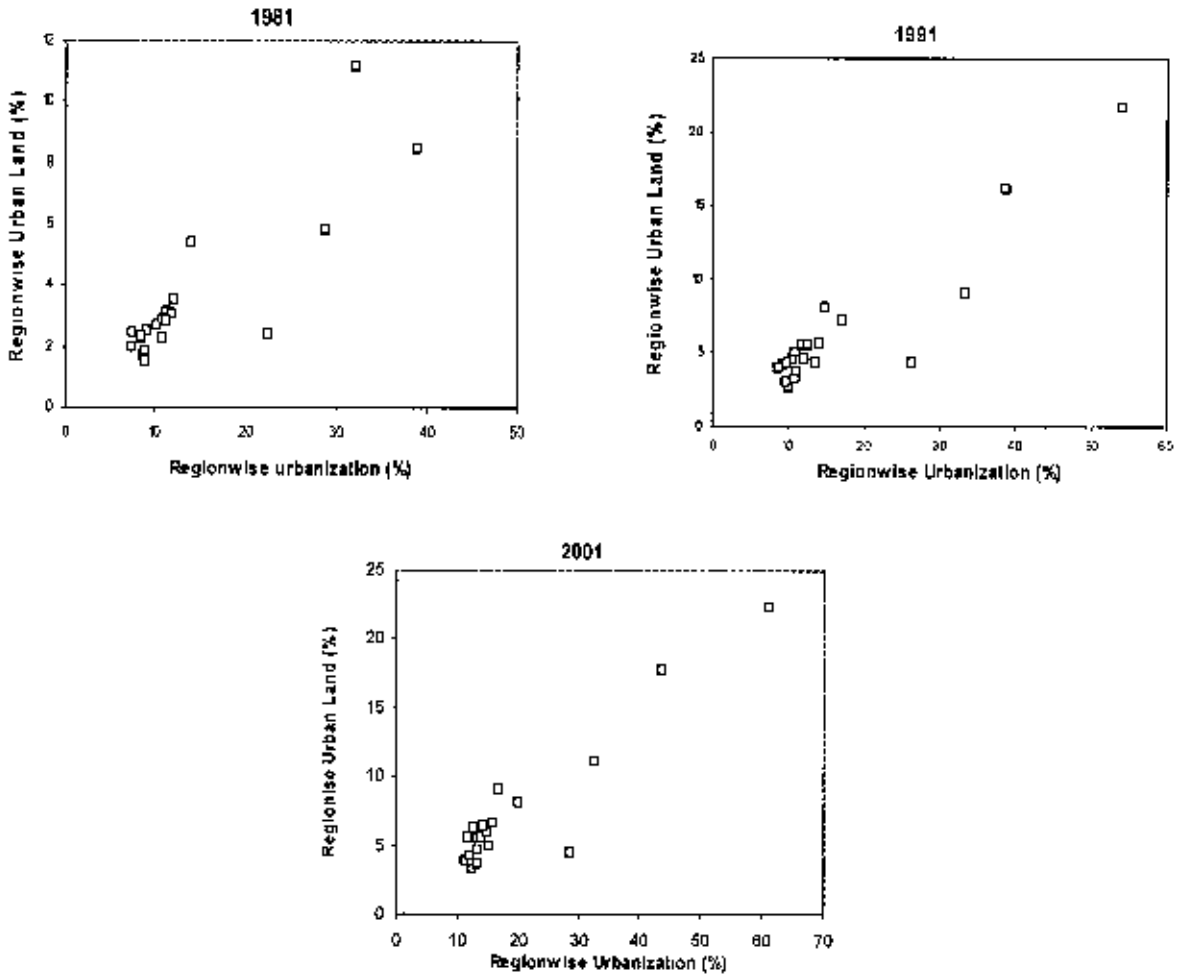


Figure C-2: Scatter plot of region wise urbanization and percentage of urban Land (1981-2001)

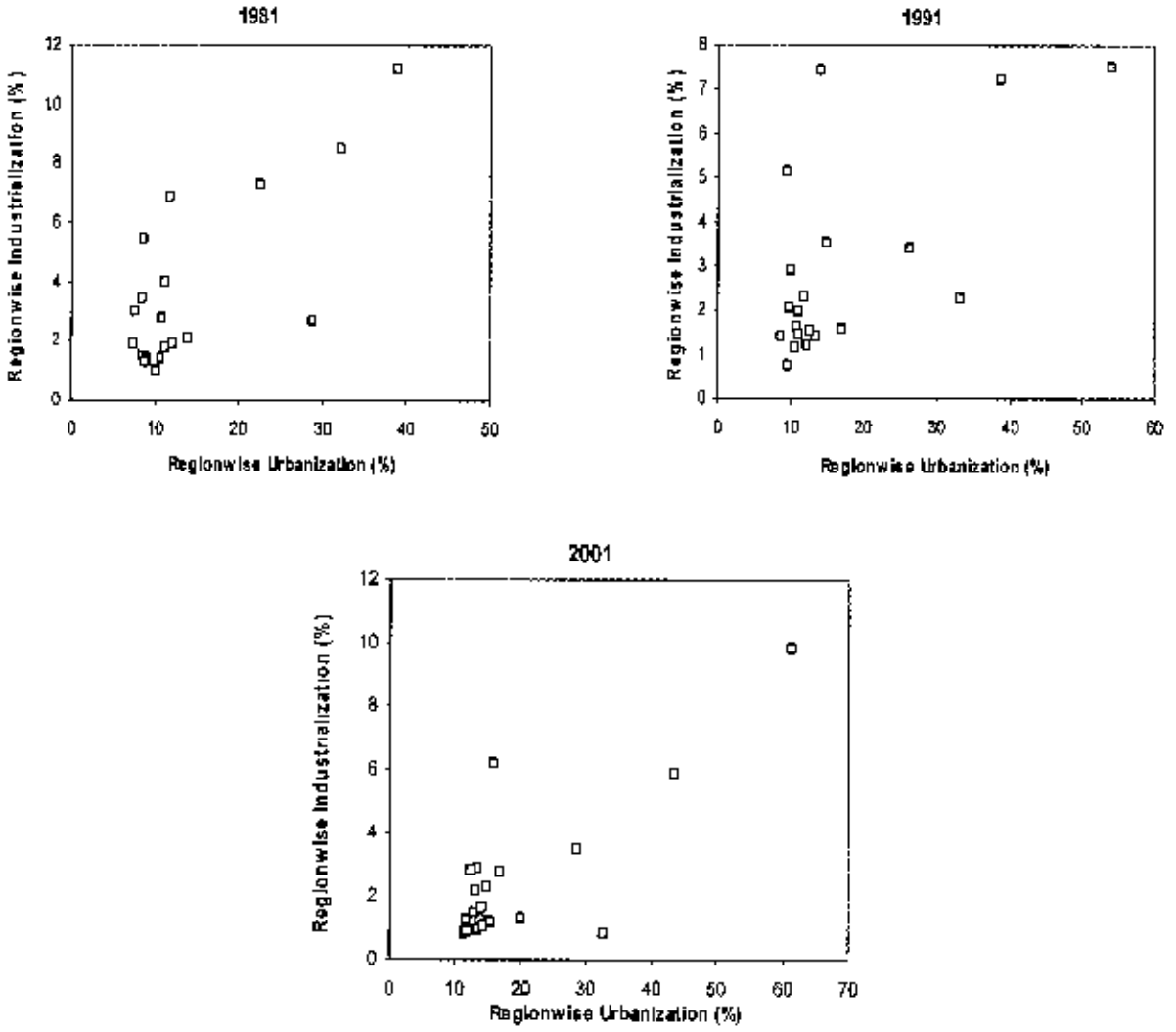


Figure C-3: Scatter plot of region wise urbanization and industrialization (1981-2001)

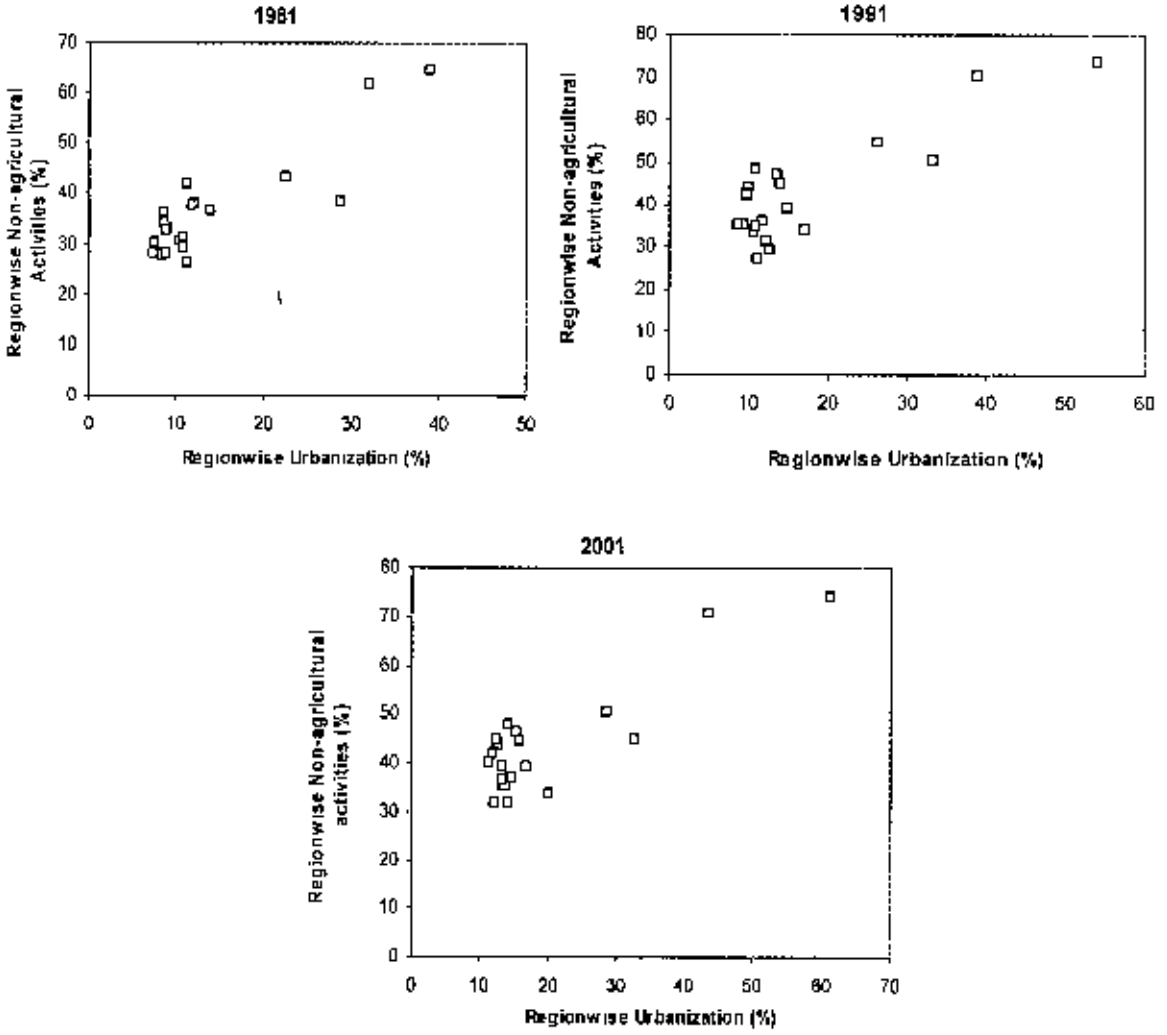


Figure C-4: Scatter plot of region wise urbanization and non-agricultural activities (1981-2001)

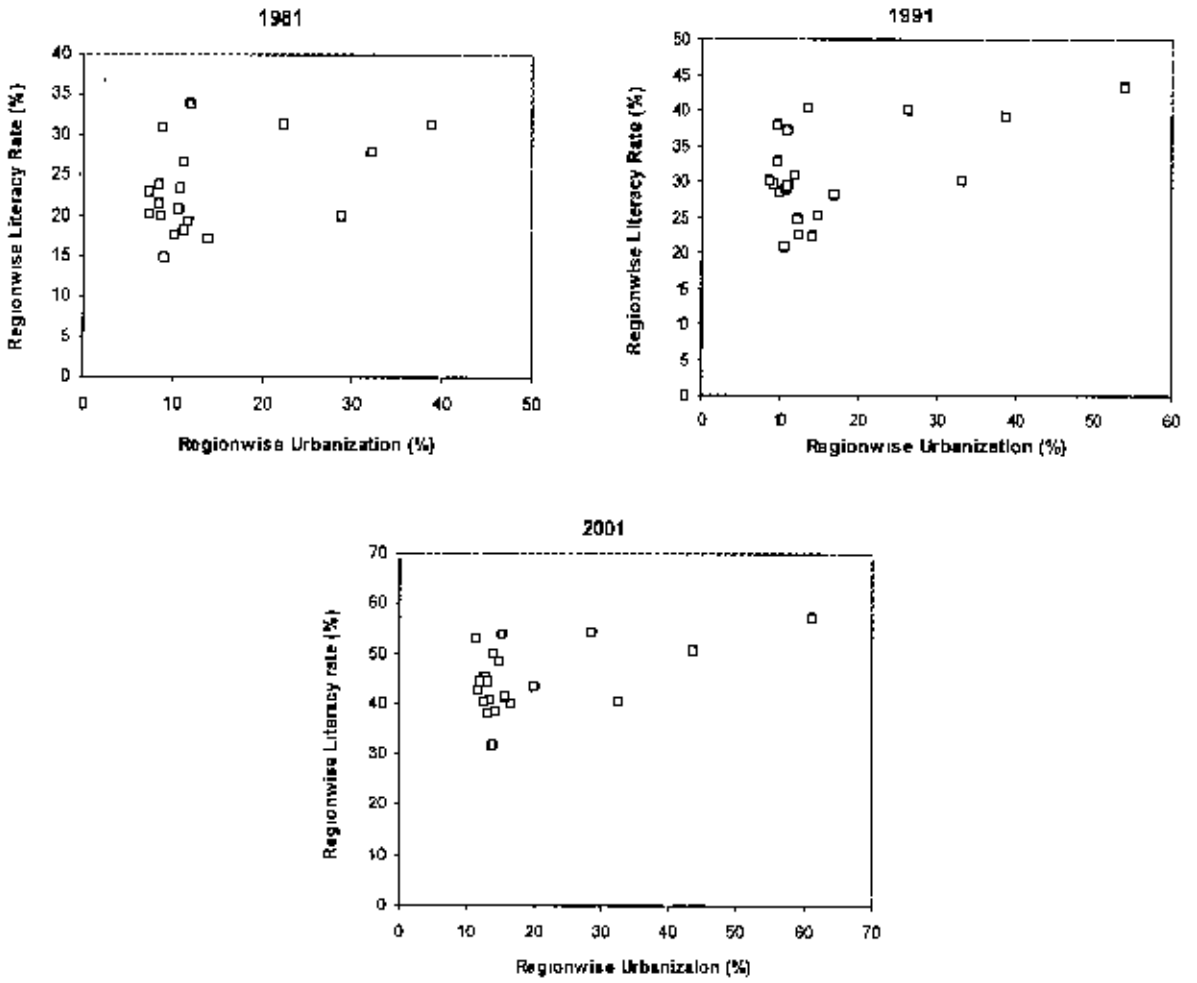


Figure C-5: Scatter plot of region wise urbanization and literacy rate (1981-2001)

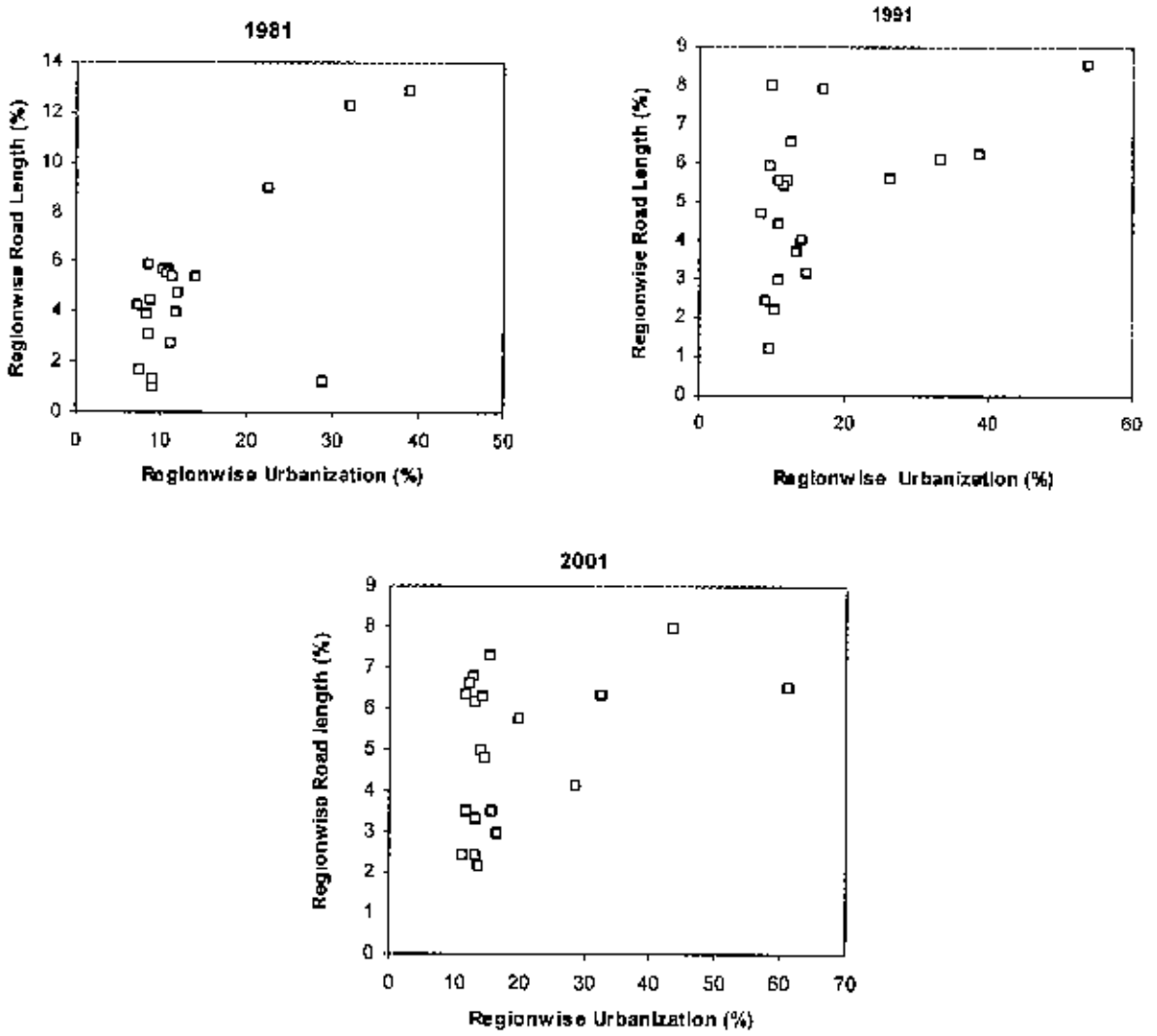


Figure C-6 Scatter plot of region wise urbanization and road length (1981-2001)

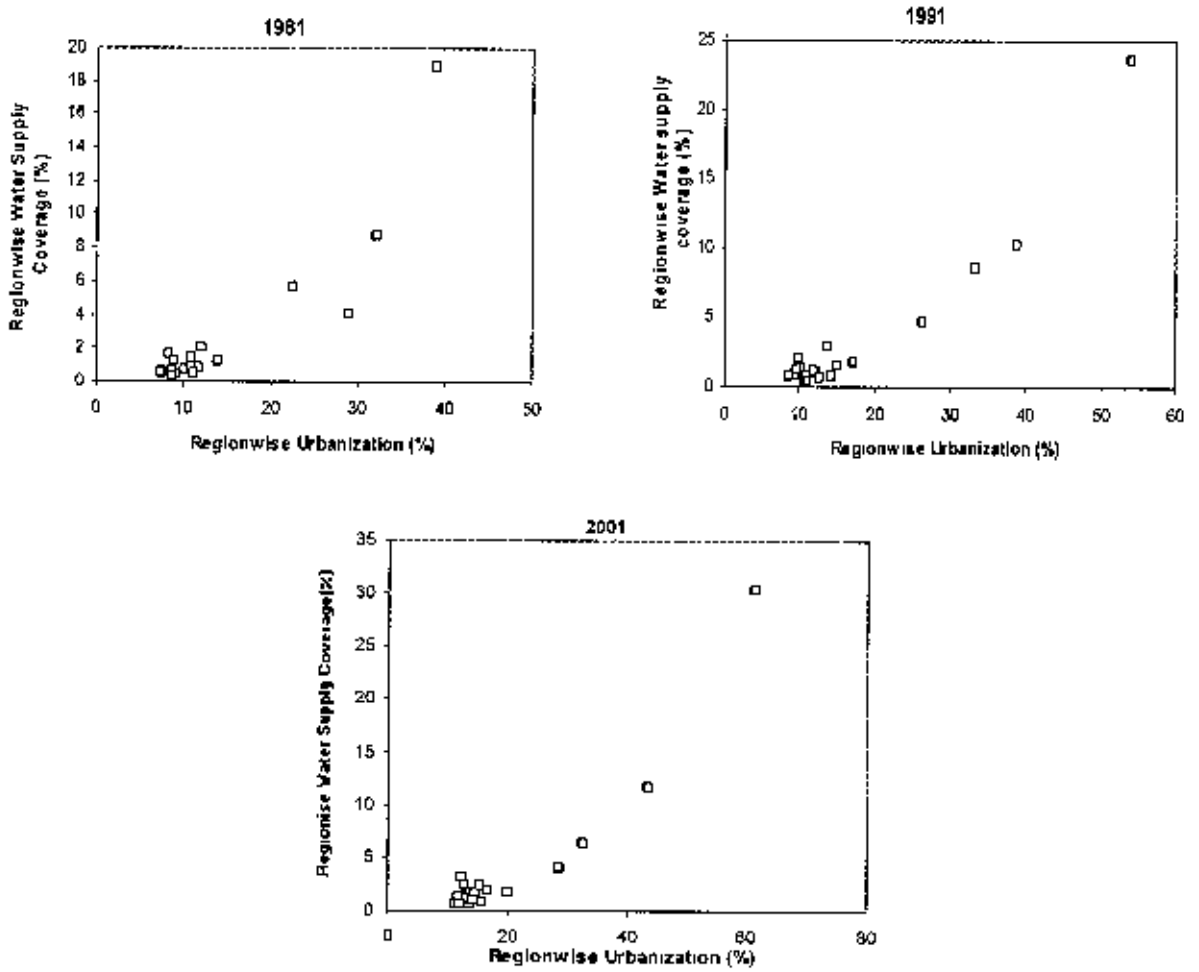


Figure C-7: Scatter plot of region wise urbanization and water supply coverage (1981-2001).

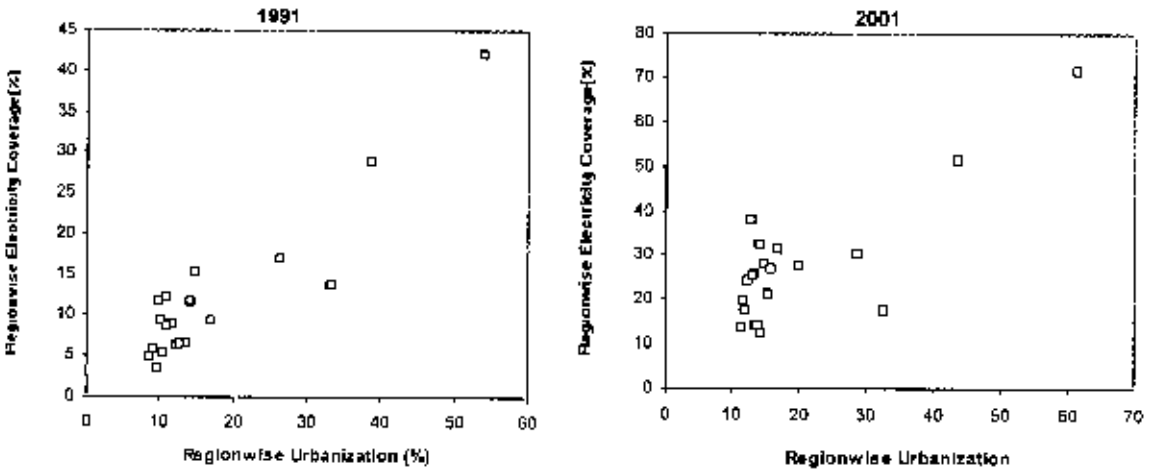


Figure B-8: Scatter plot of region wise urbanization and electricity coverage (1991-2001)

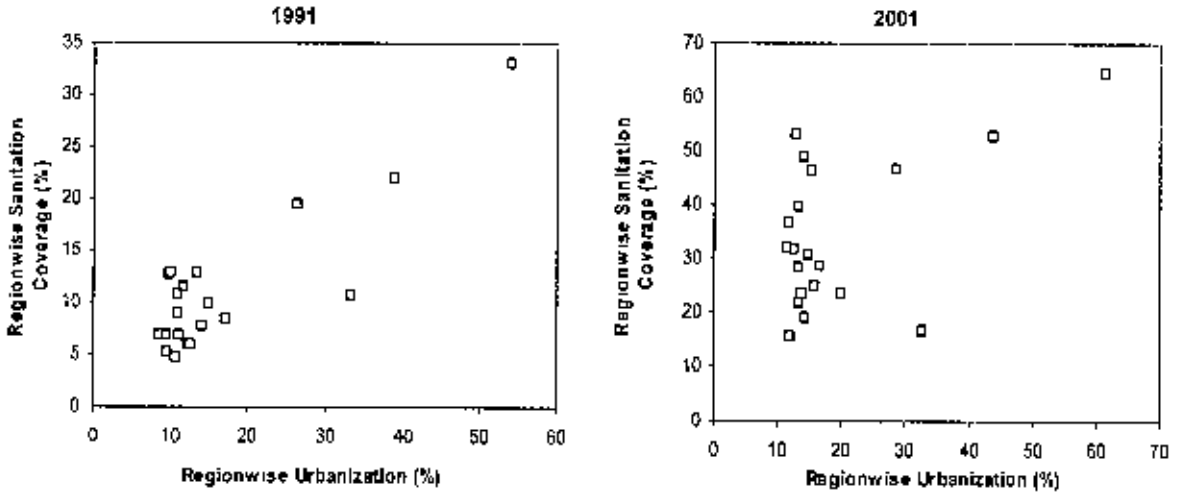


Figure C-9: Scatter plot of region wise urbanization and sanitation coverage (1991-2001)

## Appendix D

| Zila | Migration Rate | |
|---|---|---|
| | Rural-Urban (within zila) | Rural-Urban (outside zila) |
| Dhaka | 2.27 | 0.67 |
| Gazipur | 1.77 | 0.11 |
| Manikganj | 0.05 | 0.17 |
| Munshiganj | 0.19 | 0.73 |
| Narayanganj | 1.43 | 0.08 |
| Narsingdi | 0.2 | 0.24 |
| Faridpur | 0.1 | 1.84 |
| Rajbari | 0.28 | 0.05 |
| Gopalganj | 0.06 | 0.26 |
| Madaripur | 0.16 | 0.23 |
| Shariatpur | 0.03 | 0.18 |
| Jamalpur | 0.41 | 0.28 |
| Sherpur | 0.08 | 0.07 |
| Kishoreganj | 0.9 | 0.25 |
| Mymensingh | 0.49 | 0.69 |
| Netrokona | 0.18 | 0.08 |
| Tangail | 0.36 | 0.42 |
| Barisal | 0.27 | 2.45 |
| Bhola | 0.1 | 0.19 |
| Jhalakati | 0.11 | 0.08 |
| Pirojpur | 0.07 | 0.12 |
| Barguna | 0.05 | 0.1 |
| Patuakhali | 0.1 | 0.26 |
| Chittagong | 7.28 | 0.3 |
| Cox's Bazar | 0.11 | 0.03 |
| Bandarban | 0.03 | 0.02 |
| Khagrachhari | 0.05 | 0.01 |
| Rangamati | 0.13 | 0.03 |
| Brahmanbaria | 0.15 | 0.17 |
| Chandpur | 0.43 | 0.53 |
| Comilla | 0.56 | 2.61 |
| Feni | 0.06 | 0.15 |
| Lakshmipur | 0 67 | 0.13 |
| Noakhali | 0.66 | 1.18 |
| Sylhet | 0.15 | 0.18 |
| Hobiganj | 0.11 | 0.05 |
| Moulavibazar | 0.09 | 0.02 |
| Sunamganj | 0.06 | 0.03 |
| Jessore | 0.22 | 0.37 |

| Zila | Migration Rate | |
|---|---|---|
| | Rural-Urban (within zila) | Rural-Urban (outside zila) |
| Jhenaidah | 0.68 | 0.05 |
| Magura | 0.13 | 0.07 |
| Narail | 0.14 | 0.1 |
| Bagerhat | 0.4 | 0.23 |
| Khulna | 2.69 | 0.28 |
| Satkhira | 0.38 | 0.08 |
| Chuadanga | 0.74 | 0.04 |
| Kushtia | 0.22 | 0.22 |
| Meherpur | 0.04 | 0.03 |
| Bogra | 0.44 | 0.22 |
| Joypurhat | 0.06 | 0.05 |
| Dinajpur | 0.23 | 0.15 |
| Panchagarh | 0.03 | 0.02 |
| Thakurgaon | 0.11 | 0.02 |
| Pabna | 1.07 | 0.36 |
| Sirajganj | 0.45 | 0.19 |
| Naogaon | 0.36 | 0.06 |
| Natore | 0.19 | 0.05 |
| Nawabganj | 0.54 | 0.08 |
| Rajshahi | 2.05 | 0.2 |
| Gaibandha | 0.07 | 0.13 |
| Kurigram | 0.06 | 0.1 |
| Lalmonirhat | 0.07 | 0.04 |
| Nilphamari | 0.25 | 0.04 |
| Rangpur | 0.58 | 0.29 |

Source: Urban Area Report, 1991