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URBAN RANK-SIZE RELATIONSHIPS IN BANGLADESH: 1901-1981

presented by

Jashinta D'Costa

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URBAN RANK-SIZE RELATIONSHIPS IN BANGLADESH: 1901-1981

By

Jashinta D'Costa

A Thesis

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

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ABSTRACT

URBAN RANK-SIZE RELATIONSHIPS IN BANGLADESH: 1901-1981

By

Jashinta D'Costa

This study analyzed the trend in the city-size distributions for Bangladesh from 1901 to 1981. The urban structure is analyzed using rank-size plots, a rank-size regression model, and a rank-mobility index. The study has suggested that dual primacy in Bangladesh has disappeared and the urban system is tending towards deconcentration with primacy still in existence. A concentration which was in a process of emergence during the British period (1901-1947) was manifested in the Pakistani period (1947-1971) and continued through the early period of Bangladesh. Dual primacy was strong during the British regime, diminished during the Pakistani regime and disappeared during the Bangladeshi period. A process of deconcentration has been established. However, the cities in the western part showed a declining trend. The top few cities continued to maintain their higher status and the lower ranking cities their lower status.

DEDICATION

To my father (late), mother, brothers, sister and
their families whose love and support have always
been with me.

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

Table

LIST OF FIGURES

CHAPTER I

INTRODUCTION

A well articulated urban system ensures an equitable distribution of development benefits throughout a country. In such a system, the relationship between a city and its hinterland is generative rather than parasitic and deleterious core-periphery relationships are absent or less pronounced. Unfortunately, most of the less developed countries (LDCs), against a background of a long history of colonization, a rapid population growth, and little industrial development, have a characteristic trend toward polarization in urban development. Theories of urban system growth that postulate initial primacy (polarization) in urban patterns suggest that in most LDC's the rank-size relations (convergence) work poorly (Berry, 1971).

Statement of the Problem

Bangladesh, in South Asia, was under the colonial rule of Britain and Pakistan for more than 200 years. Earlier studies have shown that two phenomena, the British use of Bangladesh as a hinterland of Calcutta and the Pakistani concentration of industries in a few large cities, appear to have impeded a systematic and spontaneous evolution of the Bangladeshi urban system. This may have resulted in a parasitic relationship between the primate city and small towns. The resulting functional concentration has caused

population concentration in Dhaka, thus making it a dominant city. Furthermore, functional concentration has also caused rural to urban migration, disparities between city and countryside and between large cities and small cities in terms of development.

Like other developing countries, Bangladesh is characterized by a strong concentration of urban population growth in the primate city (United Nations, 1983). The United Nations demographic survey report has predicted that by 1991, the population of this city will be three times larger than that of the previous decade (Rondinelli, 1983). This is an indication of what might happen if the observed trend continued.

The government of Bangladesh initiated a decentralization policy in the Second Five Year Plan (1980-85). However, it is not well known if the second five year plan made a positive impact on the urban system development and in reducing primacy. As the government's policies aimed at achieving national development through the urban network, the impact of the policy can only be evaluated by examining the changes in the structures and development patterns of the urban system.

Studies of the urban system in Bangladesh are disappointingly sparse and thoroughly inadequate. There has been only one study by Moudood Elahi (1972) on city-size distribution in Bangladesh. A critical examination of the structure and development patterns of urban system has yet

to be done. Elahi (1972) also emphasized the importance of further study on this vital subject as it would explain the impact of the liberation war of 1971 and antecedent development of urban functions on the urban system in Bangladesh. Later, Carroll (1982) has suggested that a thorough study is necessary to test the observed temporal difference between urban population size and rank, using slope parameters which was not done in Elahi's study.

The study of city-size distributions is one of the several major branches in the field of urban system analysis. Implicit in this line of research is the importance placed on the 'size' of cities as a measure of population concentration (Fan, 1988). The relationship between population size and rank provides an important framework for understanding city-size distributional patterns. Very often, researchers have used rank-size plots for visual comparisons at different points in time. However, since there is a lack of consistency in the number of cities included in each rank-size plot and since a spatial component is not inherent in rank-size plots, interpretation of patterns has not been easy.

Purpose of the Study

The purpose of this study is to examine changes in the urban structure of Bangladesh from 1901 to 1981 and to evaluate current trends in the urban system. More specifically, the study will:

a. Examine the historical development of rank-size
    relationships of urban centers with a special
    reference to political changes from 1901-1981.

b. Examine the structural change of the urban system.

c. Identify and analyze the factors that have
    influenced the growth and decline of the various
    hierarchies in the system.

This study will address the following major research

questions:

1. What changes have taken place in the distributional
    patterns of urban places over the political history
    of Bangladesh?

2. Has the urban system moved toward deconcentration
    (rank-size) or concentration (primacy) over time?

3. What is the spatial trend in the current urban
    system of Bangladesh?

The study will use visual comparisons of rank-size

plots at different points in time and perform a rank-size

regression analysis for examining the overall pattern of the

rank-size relationships. Since the location of each city

and its context within the total system are also important

for gaining a more realistic understanding of the urban

system, this study will also use the rank-mobility index as

an additional tool of analysis.

Organization of the Study

The study is presented in five chapters. Chapter I

outlines the background and the purpose of the study.

Chapter II reviews the literature relating to the background

on the urban development in Bangladesh. Chapter III
discusses the methodology used in the study. Chapter IV
presents the results of analysis. Finally, Chapter V
contains a comprehensive assessment and conclusions based on
the results obtained from the study.

CHAPTER II

BACKGROUND ON URBAN DEVELOPMENT IN BANGLADESH

The purpose of this chapter is to review the literature that has particular relevance to the subject matter of this study. The first section gives an introduction to Bangladesh. The second section provides an historical account of urban development in Bangladesh and discusses the contribution and impacts of the various political regimes the country experienced on the urban structure. The third section discusses the urban system in Bangladesh beginning with a classification of towns into different size categories, and analyzing the function of each category of urban centers. The fourth section discusses urbanization problems. The fifth section examines government strategies to deal with problems associated with large cities in Bangladesh.

Bangladesh: An Overview

Bangladesh, situated in South Asia, lies between the eastern margin of the Indian subcontinent and the western fringe of vast Southeast Asia (Figure 2.1). The country stretches between latitude $20^0 30'$ and $26^0 45'$ north and longitude 88^0 and $92^0 56'$ east. It shares common borders with the Indian states of West Bengal, Meghalaya, Assam, and the Union territory of Tripura in the West, North, and East; in the South-east corner with Mayanmar (former Burma); and

Figure 2.1. Administrative districts in Bangladesh, 1991.

in the South with Bay of Bengal which is over 445 miles.

Bangladesh is one of the most crowded rural areas in the world with 106.7 million people within 144,000 square kilometers. The average density is 741 persons per square kilometer (The World Bank, 1992). And this is in a nation where more than 80 percent people are agriculturalists. The man-land ratio is 0.36 acres per person which is very low in comparison to other Less Developed Countries (LDCs).

According to the Bangladesh Population Census 1981, about 16 percent of the total population live in 491 urban centers. This is very low in comparison with many of the Asian countries (Table 2.1). The only exception is Nepal where the percentage is 6.

Table 2.1. - Percent of urban population in selected Asian countries, 1982.

Countries	Percentage of urban population
Bangladesh	16
Burma	28
India	24
Indonesia	22
Iran	52
Malaysia	30
Nepal	6
Pakistan	29
Philippines	38
Sri Lanka	24
Thailand	17

Source: Bangladesh Population Census, 1981:   Report on Urban Area, Table 2, p.12.

Urbanization in Bangladesh: An Historical Perspective

The urbanization pattern in Bangladesh has evolved through several distinct phases which are classified as the Mughal, British, Pakistani, and Bangladeshi periods. Urban development in Bangladesh began with the planned cities in the 3rd century B.C. But very little is known about the impact of these cities on the contemporary structure (CUS, 1976). During medieval times (1300 A.D.), there were several highly populated royal cities, viz., Mahastan, Sonargaon, Vikrampur, and Chatgram (present day Chittagong) which served as centers of administrative and commercial activities and religious festivities. Even though these towns had considerable population, their impact on the overall urbanization of the country was very insignificant.

The Mughal and the British periods (1300-1947) constitute the first important stage of urbanization in Bangladesh. During the Mughal period, cottage and craft industries flourished and several urban centers developed around such industrial concentrations. Throughout this period, Dhaka city with its massive population, dominated the region. During British rule, urban development was rapid and cities attained increasing importance of function as collecting centers for raw materials needed for export. Older towns also became more important as administrative centers of different hierarchies. However, functional diversity of urban centers did not occur because of the absence of industrialization in colonial Bangladesh. The

urbanization process was also hampered by the massive industrial-commercial agglomeration around Calcutta, which virtually turned the whole of Bangladesh into its hinterland.

Urbanization in Bangladesh received an impetus after 1947 when the region became independent got a separate entity from its surrounding Indian territories. This phase may further be divided into: 1) the Pakistani period (1947-1971) and 2) the Bangladeshi period (1971-present). After 1947, considerable socio-economic as well as political and administrative changes had taken place giving momentum to the urbanization process. But more important is the liberation of Bangladesh in 1971. This abrupt and dynamic change followed by violent political changeover had its impact on urbanization. The liberation of the country not only accelerated the rate of urban population growth, but also multiplied the nature and problems of urbanization. On the other hand, the Bangladesh region and its urban pattern ceased to be affected by external phenomena giving rise to an opportunity for independent settlement planning (CUS, 1976).

Hierarchy of the Bangladeshi Urban System

The nature of relationships between urban centers and its rural hinterland depends on the hierarchy of the urban centers in the system. The hierarchy of the Bangladeshi urban system is closely related with the administrative

hierarchy. Higher order urban centers represent higher order administrative headquarters. The administrative hierarchical order in Bangladesh begins with the State at the top followed by Divisions, Districts, and Sub-districts (Upazillas). Following the classification of Islam and Hossain (1975), the hierarchy of the Bangladeshi urban system is presented in Table 2.2.

Table 2.2.- Hierarchy of urban centers, 1981.

Order	Nature of Center	Size of Urban Centers	No. of Center
Lowest			
1st	Small Market place (Hat, Bazar)		168
2nd	Semi-town Thana HQ.		129
3rd	Commercial-Industrial		114
4th	Subdivisional town		45
5th	District town		23
6th	Divisional HQ.(Industrial-Commercial-Educational town)		12
7th Highest	Metropolis (National Capital)		1

The first order central places are basically rural markets. Rural market places are called 'hats' or bazars according to their functions. The 'hats' are periodic market places with a few permanent shops and a large number of temporary stalls. A bazar is a permanent market. Bazars do not have standard features like paved streets or brick buildings. But they may have post offices, tubewells, playgrounds, and lowest level of government functions. Each

has a population below 5,000. These rural markets serve as collection and exchange centers for farm products and basic consumer goods. The hinterland of the rural market is naturally the rural village which has a radius of influence of about 2 to 3 miles, with a great degree of overlapping in service areas. The larger trading centers, or specialized rural markets may have significantly large hinterlands. With the increasing demand of fertilizer and other farm inputs, the importance of rural markets is also increasing. These centers have become very important to diffuse innovations that emanate from higher order centers such as non-formal education, family planning, health, and political ideologies.

The second order central places are known as Thana (police) Headquarters. A Thana Headquarter has a minimum population of 5,000 with an upper limit of 10,000. These urban centers are semi-urban settlements with a few urban characters interwoven with many rural features. As administrative headquarters, these settlement has all the basic Thana level functions with at least one commercial bank, an agricultural bank, a post and telegraph office. Also, a few professional medical practitioners, a number of permanent retail and wholesale establishments, secondary schools and such other facilities can be found. Usually Thanas do not have colleges or permanent entertainment like movie houses. The direct zone of influence of these centers

other than administrative functions extend up to about 10 miles.

The third order central places are the industrial-commercial centers or subdivisional headquarters. In this category, the range of population is 10,000 to 25,000. This order of urban center enjoys most of the basic urban services as well higher order functions such as colleges, hospitals and movie houses. A few may even have weekly newspapers. There are 114 urban centers in this group. These urban centers have a significant role to play in the diffusion of urban services to the rural hinterland. Their influence extends to about 15 miles in any single direction, and covers approximately 50 miles of territory (Islam and Hossain, 1975).

The fourth order central places are the sub-divisional centers having population 25,000-50,000. These towns serve as sub-divisional headquarters and district headquarters. They offer all the services of the previous order centers, and many of them have taken on a higher order of trading, educational, and cultural services. The zone of influence of subdivisional towns covers about 100 square miles. The direct zone of influence in one direction is approximately 20 miles. There are 45 urban centers in this category.

The fifth order central places are district towns. They have 50,000-100,000 people in them and there are 23 of these centers. Districts towns have all the functional characteristics of the preceding orders and include new

functions with growing industrial and commercial activities. Higher order technical education and higher order administrative services differentiate these from lesser order towns. There is no urban mass public transport such as bus services, but bicycle rickshaws and motor-rickshaws are common public services which provide both intra-urban and urban to rural services. Local buses, trains, motor launches and boats, make the major center-hinterland transport links. The hinterland limits extend to about 40 miles in any one direction and cover about 200 square miles.

The sixth order central places are divisional headquarters. These have 100,000 to 1 million people. There are 12 of these centers out of which three are divisional headquarters (Chittagong, Khulna, and Rajshahi), and seven are district headquarters. Khulna and Chittagong, are two port towns which have vast hinterlands spreading over nearly half of Bangladesh. Their direct zone of urban influence cover areas of approximately 3,000 miles. These also include the university towns of Rajshahi and Mymensingh which have comparatively smaller hinterlands about 500 square miles.

The seventh order central place is the metropolis of Dhaka, the national capital. Dhaka is the administrative center and national metropolis containing the highest order of services in the nation.

The urban centers with a population of less than 50,000 hardly command a significant urban influence beyond a

distance of 10 miles. There are 36 urban centers with population of 50,000 or more. These do have a more significant influence especially along transport arteries. The largest urban centers which are 10 in total, command multi-functional direct influence over large rural hinterlands. Thus, only one-third of the total territory of Bangladesh come within the zones of direct urban influence. Two-thirds of the rural area require various direct urban services for development in economic and socio-cultural spheres.

Problems of Urban Development in Bangladesh

Primacy

Dhaka has experienced a high growth rate since 1951. In 1901, It had 18.35 percent of the total urban population. In 1981, Dhaka's share of the urban population rose to 25.41 percent. The United Nations (1983) has predicted that Dhaka will experience a dramatic growth in the coming decades. Table 2.3 shows the growth of Dhaka city from 1901 to 1981.

Table 2.3. - Growth of Dhaka, 1901-1981.

Census Year	Total Urban population	Dhaka's urban	% of urban
1901	702,035	128,857	18.35
1911	807,024	153,609	19.03
1921	878,480	168,510	19.18
1931	1,073,489	196,111	18.27
1941	1,537,244	295,735	19.24
1951	1,819,773	335,928	18.46
1961	2,640,726	556,712	21.08
1974	6,273,602	1,679,572	26.77
1981	13,535,963	3,440,147	25.41

Data Source: Population Census of Bangladesh 1981.

According to 1981 Census, about 52 percent of the urban population live in the urban centers having population of 100,000, Dhaka's population being 25 percent.

Table 2.4.   Bangladeshi primacy index*, 1901-1981.

Year	2-City Index
1901	1.21
1911	1.23
1921	1.34
1931	1.13
1941	1.32
1951	1.16
1961	1.53
1974	1.89
1981	2.47

*The primacy index is the ratio of the population of the first city to that of the second, third and so on, depending on the criteria. A 2-city index denotes P = P1 / P2, where P = index of primacy; P_1, and P_2, represents population of first and second cities respectively. Primacy occurs when P = 2.00 or more.

Urban primacy has been growing in Bangladesh. The
Table 2.4 shows clearly that from 1901 to 1974, 2-city index
exhibited a 'dual primacy' or 'binary pattern' in the
Bangladeshi urban system. The Two-city indices show that
the overall primacy ratio steadily increased between 1901
and 1931 and again between 1951 and 1981. The only decline
was in 1931 and 1941 and this must have been due to the
increased urban functions as it became an official sea port
in 1928. However, the overall 2-city primacy indices show
the increases from 1901 to 1981.

The United Nations (1983) has predicted that by the
year 2000 Dhaka will be the nineteenth largest city in the
world with 11.2 million people. Experts predicted further
that it will be the fifth most populous city by the year
2025. Islam (1989) puts Dhaka's present population at six
millions and the other three cities Chittagong, Khulna, and
Rajshahi at 2.5 millions, one million, and 0.5 million
respectively.

Ahmad (1967) investigated city-size distribution of
Pakistan, East Pakistan, and West Pakistan of 1951 and 1961.
The purpose was to determine if distribution had become more
normal over time. Using rank-size and log-normal
probability plots, he found that the primacy ratio for
Bangladesh, the then East Pakistan, was 42.9 and 45.9 for
1951 and 1961 respectively. The increase of the primacy
ratio was the result of a phenomenal growth in the
population of the primate city Dhaka. He found that the

distribution of cities in each year was more primate than lognormal; but it is best classified as intermediate.

Elahi (1972) studied the Bangladeshi urban system between 1901-1961. The purpose was to asses primacy in Bangladesh. He used rank-size and log-normal probability plots and found that in Bangladesh, primacy was diminishing over time and development. Berry (1961) also studied the city-size distribution patterns of Bangladesh from 1901 to 1961. His study clearly shows that the Bangladeshi urban system is dominated by one primate city.

None of these studies tested the slope of the curve statistically. These studies were based on a visual inspection of graphs (Carroll, 1982). Moreover, they show different kinds of city size distributions for Bangladesh for the same periods. While both Elahi and Ahmad (1967) found a dual primacy in Bangladesh, Berry's study showed a clear primacy in the Bangladeshi urban system. It appears that the source and definition of data may have contributed to the inconsistency in their findings.

Site and Situation of Dhaka

The growth and form of Dhaka city is restricted by physical conditions, i.e., river system and the height of land in relation to flood level. The southern part of the city is bordered by the Buriganga river. The east and west sides are bounded by the low lying flood plains of the Balu and Turag rivers respectively. A greater percentage of land

free from floods is located in the north of the city. Thus,
the city is only expanding in one direction resulting in
higher distances and transport costs to the city center.

Rural-to-Urban Migration

Urban growth in Bangladesh has been occurring mainly
through rural-to-urban migration. In a study on rural-urban
migration, Khan (1983) found that 50 percent of national
urban growth during 1961-1974 period was due to rural-to-
urban migration. The migration pattern varied among urban
centers. He found that due to in-migration population

Table 2.5. Component of population growth in six major
cities of Bangladesh, 1961-1974.

City	Population		Components		
	1961	1974	Natural Increase (%)	In-Migra-tion (%)	Annexa-tion (%)
Dhaka	521,034	1,679,572	18	74	8
Chittagong	364,205	889,760	28	43	29
Khulna	175,023	437,304	27	43	a
Narayanganj	162,054	270,680	41	17	42
Mymensingh	53,256	182,153	17	25	58
Rajshahi	56,885	132,909	30	36	34

Source: Khan, 1982.
Note: Khulna annexed two urban areas during the period, and
the combined population was used as the base population.

increased by 74 percent in Dhaka, 43 percent in Chittagong,
and 43 percent in Khulna. Natural increases for these three
cities were 18 percent, 28 percent, and 27 percent
respectively (Table 2.5). On the other hand, the in-

migration was less important in the small cities of
Narayanganj, Mymensingh, and Rajshahi. These migration
patterns are presented in Figure 2.2. During the same
period small urban centers having population below 15,000
experienced more than 80 percent increase from rural to
urban migration, such as Rangamati (81 percent), Chowmuhani
(89 percent), and Chuadanga (81 percent). Barisal, the
fifth ranking city in that time lost population through out-
migration. In other centers, urban growth mainly occurred
by natural increase.
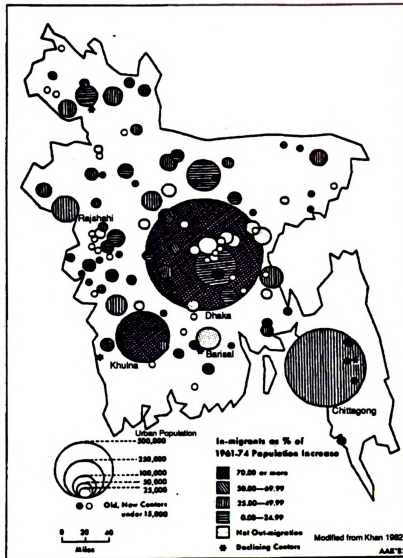
Figure 2.2. Net migration for Bangladeshi cities,
1961-1974. Source: Khan 1983.

A survey on urban squatters in 1974 shows that the main
cause of in-migration to large urban centers is primarily to
search for employment. Other reasons, listed in order of
importance are - amenities of urban living, medical care,
educational opportunities, social justice, and improved
social status. Also, existing severe disparities between

rural and urban sectors in levels of living and wage rates and the perceived potentials for employment in high paying jobs have induced rural out-migration. Khan (1983) also remarked that the reason is that rural economics are unable to absorb the rapidly increasing labor force because of the prevalence of the traditional agricultural system and the absence of significant opportunities in non-agricultural activities.

Migrants from rural areas are mainly young adults. This has caused abnormal age pyramids both in rural and urban areas of Bangladesh. Urban areas are marked with concentration of younger people, while rural areas have more older people (Khan, 1982). Because of the relatively youthful urban population, natural increase is also an important component in the future growth of urban population (Khan, 1982).

Choguill (1987) noted that migrants often originate in the surrounding areas. In big cities, especially Dhaka, Chittagong, and Khulna, migrants are more likely to come from more distant areas in the country. Dhaka receives migrants from Comilla, Noakhali, Mymensingh, Faridpur, and Bakerganj districts. Chittagong drew people from Noakhali, Comilla, and Dhaka districts. Khulna's migrant population mainly comes from Bakerganj, Jessore, Faridpur, and Noakhali districts.

Functional Characteristics

Dhaka has a virtual monopoly on main urban functions
with higher order secondary, tertiary, and quaternary
services located in the city. It is also a center of
government, international affairs, high level educational
and cultural institutions, transport, and industry. About
70 percent of all the manufacturing industries and 69
percent of all the employment in Bangladesh are concentrated
in Dhaka city.

Internal Characteristics

Development disparity exists not only between principal
urban centers and their rural peripheries. Polarization in
level of living is also found within large cities. A survey
conducted by UNDP revealed that 50 percent of the total
urban population live in squatter settlements or bustees.
Population in the *bustees* are overwhelmingly poor. The
average total household income is about 832 taka (about 42
US dollars at 1 US\$ = 40 taka) or less. Among them, 70
percent are below poverty level and their monthly income is
less than 600 taka (about US\$15)(Islam and Khan 1988). Most
of the squatter settlements in Dhaka city are overcrowded
with densities over 2,000 persons per acre (Islam, 1988).
Dwellings are constructed with bamboo, sacks, mat, plastics,
etc. These huts, erected with disposable materials,
disfigure the cities and create health and fire hazards.
Shanties cause environmental deterioration and unhygienic

living conditions. They also adversely affect the moral and social health of the inhabitants (Chowdhury and Asad-Uz-Zaman, 1976). The infant mortality rate in slums is 150 per thousand live births. It is higher than the national average of 116 per thousand (Robson, 1991). A slum house occupies about 10 to 15 square feet with 10 or 15 people sleep in one room. There are 1125 squatter settlements of this type in Dhaka city. In contrast, one upper class residential house occupies close to one acre.

Growth of Large cities: A Theoretical Perspective

Developing countries are plagued with 'large city' problems. The 'large city' or primacy problem can be analyzed in terms of a core-periphery relationship described by Friedmann (1966). Friedmann's core-periphery model is essentially a colonial model. In the core periphery relationship, a polarized spatial structure is inevitable with a strong center or core which dominates production and consumption and lives off peripheral hinterlands. Figure 2.4 illustrates this model. Wubneh (1982) using Friedmann's

model in the case of Ethiopia explains it as follows:

> ".... the territory of a nation-state has a
> spatial structure, as depicted in Figure 2.3A, with a
> national metropolitan center linked to small subcenters
> by some pattern of relationships that determines the
> sphere of influence as well as the flow of goods,
> resources, people, and so on. The national metropole
> or core has a stronger base, economic and political,
> because of initial advantages which may be historical,
> geographic, or resource endowment, for example. The
> process of "cumulative causation" reinforces the
> comparative advantage or the established dominating
> linkages that the core enjoys over the periphery. With
> its strong economic and political power, the core
> organizes the periphery for its own purposes to supply
> raw materials, to be a market for its products, and so
> on. Thus, in the model, the subcenters are used as
> hinterlands to the national metropole and the flow of
> resources tends to be asymmetrical in favor of the
> latter. On the other hand, the national metropole's
> relationship with the colonial metropole (Figure 2.3B)
> makes the former the hinterland of the colonial
> capital. Thus, the national metropole is the
> intermediary - the exploiter and exploited - in the
> international setting" (pp. 5-6).

The core-periphery model explained by Wubneh can be

applied in the Bangladeshi situation. But, British colonial

rule has complicated core-periphery links by assessing a

strong international dimension to the Bangladeshi situation

than was the case in Wubneh's Ethiopia. In the Bangladeshi

case, two types of spatial structures can be found during

the British colonial period: (1) regional, and (2)

national. The British colonial spatial organization kept

Dhaka as a regional capital while Calcutta's role was raised

to a national center. Dhaka served as a collecting center

of raw materials for shipment to Calcutta. Dhaka remained

in the shadow of Calcutta which was used as a colonial

metropole, in which major colonial processing including
manufacturing took place. Thus, there was no industrial
development in Bangladesh. This structural effect of
British colonial rule in India and Bangladesh is illustrated
in Figure 2.3.

A NATIONAL SPATIAL   B COLONIAL LINK
   STRUCTURE

—— National Boundary
——► Exports from Hinterland to Core
---► Imports by Hinterland
● Colonial Metropole
⊗ National Capital
⊘ Regional Center
   (Agricultultural and/or
    Administrative Center)
⊕ Hinterland
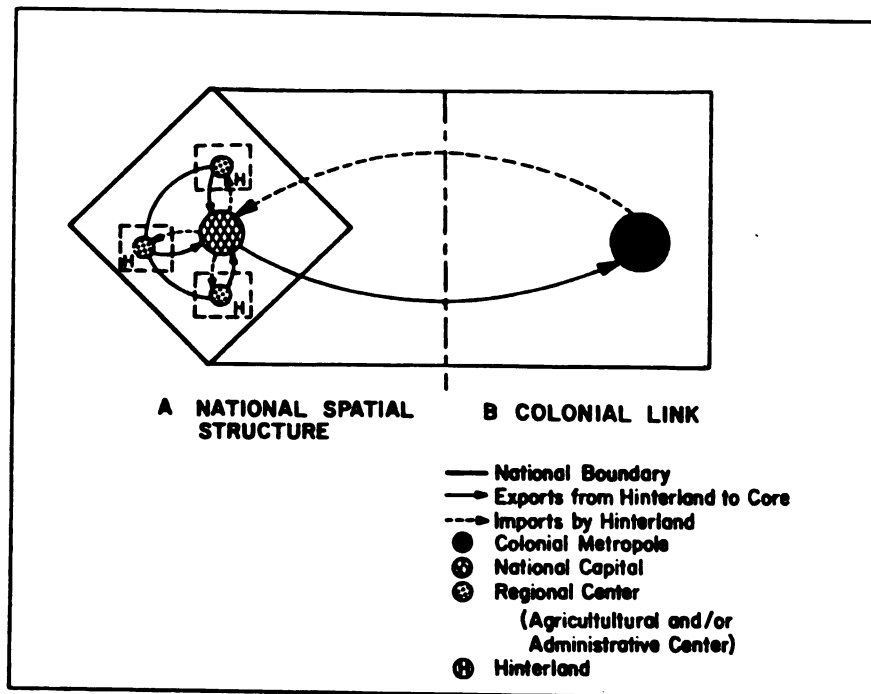
Figure 2.3. The core-periphery model. Source: Wubneh,
             1982.

Figure 2.3 shows that development in Bangladesh lagged
well behind that off India. One manifestation of disparity
in economic development is the construction of a railroad.
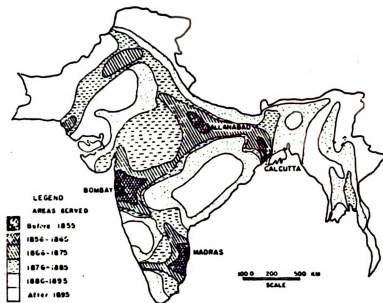
Figure 2.4. Railway services in the Indian sub-continent.
             Source: Berry, 1971.

Ahmad (1976) noted that construction of a railroad started
in the Bangladesh region in 1852, 10 years after starting in
India. But the progress was slow until 1862. This railway
system was constructed only to integrate the metropolis and
its hinterlands to collect raw materials.

        Fisher (1989) commented that the railway system
constructed by the British in India was one manifestation of
the exploitation of the economy of the country. He stated
that "British rule influenced the spatial layout of India's
production and circulation systems. Several focal cities
grew rapidly, and a railway system was constructed to
integrate them with each other and with their regional
hinterlands, which could then be developed and exploited

easily." Rizvi (1969) also mentioned that the opening of the East Bengal Railway Company was "more political than commercial". Structuring control of the spatial layout is also evident in other countries which were also under the British rule. For example, Dickensen and Hodgekiss (1983) reported that the railroad systems constructed in East Africa were designed for the export of minerals. These rail systems expanded from port cities and did not link cities laterally generating unbalanced urbanization. This observation agrees with Berry (1971) as he observed that the Bangladesh region was the hinterland of Calcutta during the British period.

Under Pakistan, Dhaka became the administrative capital of Bangladesh and this created some dynamics for the city. Subsequently, large scale investments in the physical and social infrastructures accompanied by industrial development gave Dhaka a boost in its primacy. The Second Five Year Plan (1965-1970) invested nearly 43 percent of the state's total plan funds in the development of industry, social, and physical infrastructures in Dhaka, Chittagong and Khulna. This rose to 46 percent in the Third Plan. Similarly, a
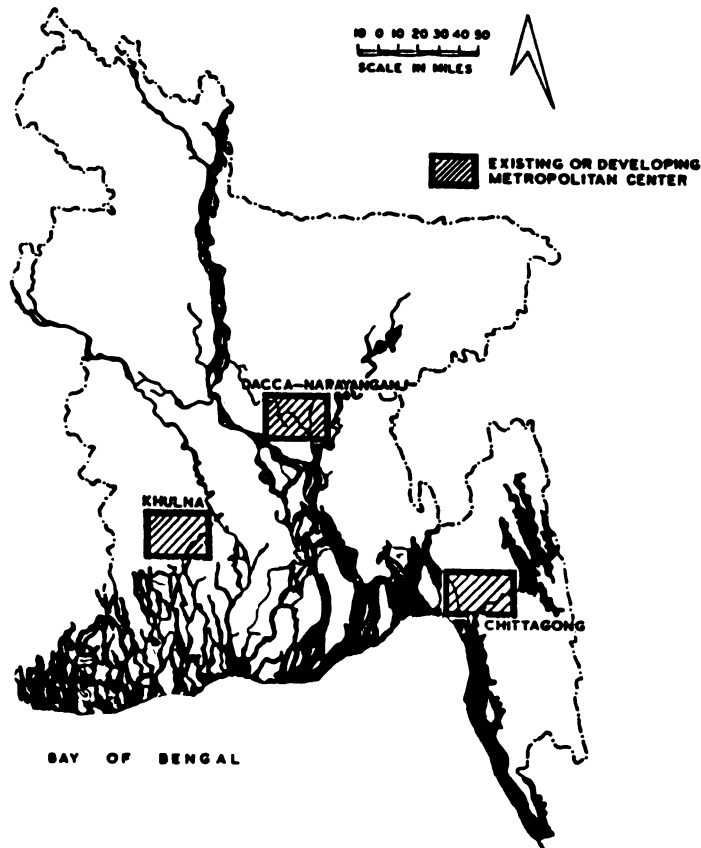
Figure 2.5. Polarization of development during the
            Pakistani period. Source: Sibli, 1980.

major proportion of the private investments in industry,
housing, and transport were invested in these three cities.
Thus, nearly 60 percent of the total fixed assets in large
scale industries are located in these three cities (Figure
2.5). The urban-biased investment policies resulted in an
increased concentration of economic activity and fostered
further concentrations of population. Such conditions
favorable to concentration breeds further growth in the
urban sector (Wellisz, 1971).

Strategies to Address Large City Problem

In the light of the growing problem of high
concentration of population in large cities especially in
Dhaka, a strategy has been implemented by the government of
Bangladesh to alleviate the current situation. The main
aspect of this strategy is to decentralize development by
pushing growth in new urban centers. Besides, a number of
policies are suggested by the World Bank (1979), Richardson
(1987), and regional planners. The main aspects of these
suggestions are: (1) development of the existing secondary
and tertiary urban centers that show potential for
expansion, (2) increase of the per capita urban absorption
costs.

In order to slow down the growth of large cities and
distribute development benefits to the rural areas, the
Bangladeshi government has implemented a decentralization
policy in 1982 using the Second Five Year Plan (1980-1985).
The aim was to create a harmonious urban structure that
would serve local communities in raising their standard of
living. The government's goal also included the devolution
of socio-economic and development activities throughout the
country from center to periphery. But in practice, it was
only further administrative control rather than
decentralization to share the development resources of the
country. Even if the government meant to decentralize
development, resource constraints were a major impediment to
effect real decentralization. Shakur (1987) noted that it

is unrealistic that decentralization of industries to other areas will necessarily prevent the growth of the country's central region, particularly its biggest metropolis, Dhaka. It may still be assumed, however, that if "decentralization" occurs in a significant manner, it might slow down the rapid growth of a few urban centers and thus reduce the attractiveness of major cities and towns from potential migrants. Demographers and planners suggest that what needs to be done is to develop local natural resources and increase industrial activity in peripheral areas. This will keep in urbanizing the hinterland and thereby decentralizing development. The main problem encountered in implementing the Second Five-Year Plan was resource constraints (The Third Five Year Plan, 1980-1985).

The literature in urban development reveals that initiative of decentralization to solve problems associated with the creation of new towns, shows that the venture has not fulfilled the intended purpose. Chief reasons for the failure are cost of construction, difficulties in acquiring sufficient land, and the complex mix of social, economic, and political factors that govern where people and business can locate. Reviewing the success and failure of new towns, Williams *et al.* (1983) found that the majority of new towns, whether in the West, in the Soviet Union, or in LDCs, tend to fall quite short of intended goals. It is indicated that it is extremely difficult to achieve the goals of new towns without having total control over land use, construction,

and the lives of citizenry as is often the case in communist
states. Realizing this problem of creating new urban
centers, the 1979 World Bank Development Report suggested
that in order to counter-balance the growth of the primate
cities, secondary cities that show potential should be
developed.

On the other hand, Richardson (1987) remarked that
large city problems in Bangladesh are mainly due to the
underinvestment in urban infrastructural development. He
believes that Bangladesh needs to invest money in urban
development not only to solve urban problems but also to
eliminate the possibilities of withdrawal of foreign aid.
Richardson (1987) commented that as the rural poverty is the
most important problem in Bangladesh, it is hard to conceive
that the government will invest more in the large urban
centers. It would be difficult to raise such resources on
behalf of urban development.

Summary

Based on the review and critique of the literature
dealing with development pattern of Bangladesh's urban
centers, it is strongly suggested that the colonial rulers,
British and Pakistan, always favored large city/cities to
invest resources and control the economic condition of the
country. Chapter III presents the methodology to capture
the impact of different policies of urban system and to

identify the present trend of city-size distribution in Bangladesh.

CHAPTER III

THEORIES AND METHODOLOGY APPLIED IN THE RESEARCH

Introduction

In studying the developmental patterns of Bangladesh's urban centers, three approaches have been used: (a) the historical development of rank-size relationships of urban centers, (b) the structural change the of urban system, and (c) the growth pattern of selected urban centers. Three methods are used to study the historical structure of the Bangladeshi urban system: (a) rank-size plots, (b) rank-size regression analysis, and (c) rank-mobility index.

Theory and Methodology of Analysis

The Rank-Size Model

The rank-size regression model developed by Zipf (1949) is used for observing the urban data in Bangladesh. In his work Zipf used communities that contained at least 2,500 inhabitants in the 1930 United States Censuses. He used the rank-size relationship to examine a wide variety of issues. One of these is to examine the rank-size function which is most widely used to investigate whether the relationship between city size and rank conforms to an expected pattern in accordance with the rank-size rule. According to this rule, when urban populations in an area are ranked in a decending order of population size, the population of the second city is half the population of the largest city, the

third city a third of the population of the largest city,
and so on (Zipf, 1949). Symbolically, the rank-size rule is
expressed as follows:

$$P_r = P_1/r \qquad\qquad ..(1)$$

where, r = the rank of a city; P_r = the population of the
city of rank r; and P_1 = the population of the largest city
(rank = 1). When plotted on double logarithmic graph paper,
this relationship produces a straight, downward-sloping line
with gradient of -45^0. The hypothetical rank-size
distribution describes an urban system containing a few
large metropolis, a larger number of medium-size cities, and
a still larger number of smaller towns.

This basic formula is often modified by a constant (*b*)
to allow variations from the strict rank-size rule. This
produces the following modification:

$$P_r = P_1 \cdot r^{-b} \qquad\qquad ..(2)$$

where *b* is the slope of the line joining various sizes of
cities arranged in rank order on double logarithmic paper.
Zipf designated the distribution as "rank-size" if the
exponent *b* equaled -1 (Figure 3.1). He characterized the
rank-size distribution as an ideal city-size distribution.
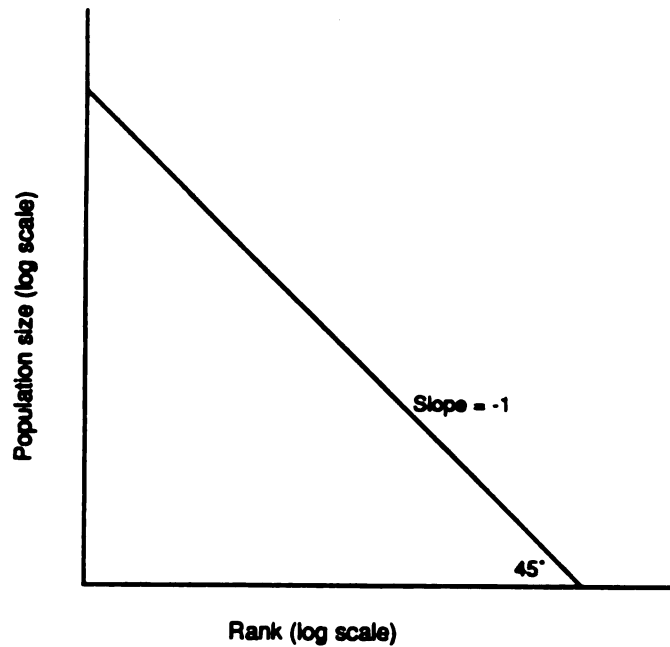
Figure 3.1. The rank-size rule.

The linear relationship (equation-2) described by the typical rank-size graph can be expressed in the following equation:

$$\log P_r = \log a - b \log r \qquad ..(3)$$

where P_r = the population of the city of rank r
r = the rank of the city
a = the intercept; also, the logarithm of the largest city
b = the slope coefficient

This rank-size relationship expressed in the equation (3) is used to confirm the visual observations made on rank-size plots. For this purpose, the parameter b is

estimated from the empirical data by standard least square linear regression. The linear regression equation is as follows:

$$\log P_r = a + b \log r \qquad \qquad ..(4)$$

Where, P_r = dependent variable (log population of the rth ranking city)
  r = independent variable (log rank)
  a = intercept; also, the logarithm of the estimated population of the largest city
  b = the slope of the straight line

The dependent and independent variables, population of urban centers and rank of cities were ranked on the basis of the population size in a decending order and were converted into logarithms for use in the regression equation. The computation was done on a computer, using SYSTAT statistical package, version 5.01.

In practice, because the rank-size line necessarily slopes downward to the right, the value of the slope parameter, *b* is invariably negative. The b-coefficient evaluates the rate of change in population size associated with the rate of change in rank.

The *b-coefficient* can be used to define rank-size distributions between two extreme limits of rank-size relations: perfect evenness and perfect concentration (Fan, 1988). In a situation of perfect evenness, all cities are of the same size and the *b-coefficient* approaches zero (Figure 3.2a). On the other hand, the *b-coefficient* can

approach negative infinity if all the urban population is concentrated in one city (Figure 3.2b).
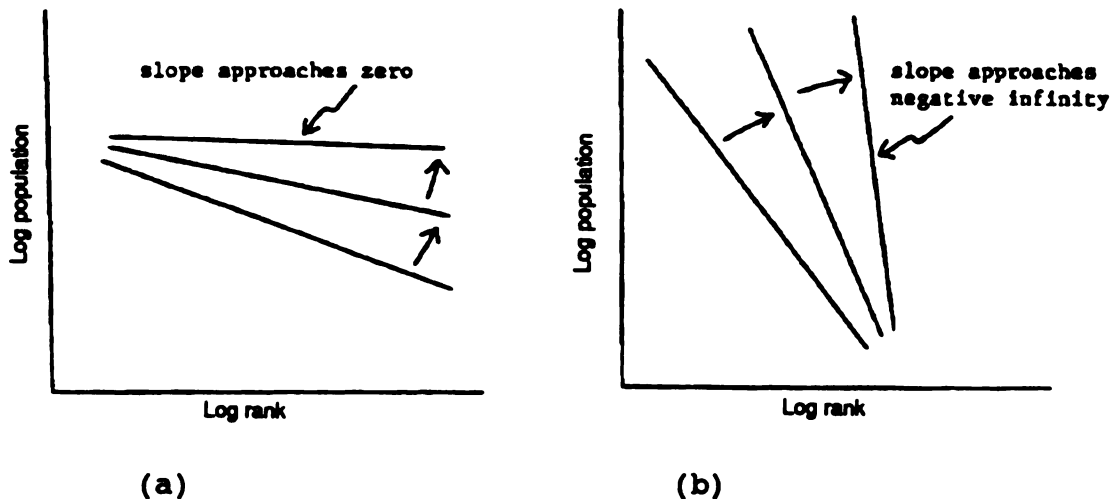
Figures 3.2. (a) Tendency toward perfect evenness.
            (b) Tendency toward perfect concentration.
            Modified from Fan 1988.

Based on this reasoning, Danta (1985) suggested that the b-coefficients associated with rank-size distribution (b = -1) provides a useful benchmark for estimating the distributional characteristics of urban population within a relatively closed urban system. When it is more negative than -1, it indicates a larger percentage of the population living in higher ranking cities than would be expected by the rank-size rule. On the other hand, b values more positive than -1 indicate that lower ranking centers are relatively more populated than would be expected by the urban rank size rule. It means that the parameter b of the

rank-size function is indicative of the relative

distribution of population contained within an urban system.

The Rank-Size Plot

This method involves plotting of city populations

against the related ranks on a double log arithmetic paper

and is used for comparison of growth patterns of the urban

system within a country. Most commonly, such plots reveal

four types of city-size distributional patterns (Sheppard,

1982; Haggett, 1983):

1. <u>Rank-size distribution</u>:
   In rank-size distribution pattern, the curve is downward straight line on log-log paper with -45^0. According to rank-size rule, the population of any city of rank n is equal to the population of the largest city in the system divided by n.

2. <u>Primate distribution</u>:
   This pattern exists where the top ranking city or two cities dominate the distribution. When two cities dominate with equal magnitude, the pattern is known as 'dual primacy'. In the plot, steeper curves represent 'primacy' and flatter curves suggest that the growth of the primate city is less than that of other cities.

3. <u>Convex distributions</u>:
   This pattern exists where there are a number of equally large cities that dominate the urban system.

4. <u>S-Shaped Distribution</u>:
   The s-shaped distribution pattern may be seen where primacy and convex patterns co-exist.

These patterns are clarified in Figure 3.3
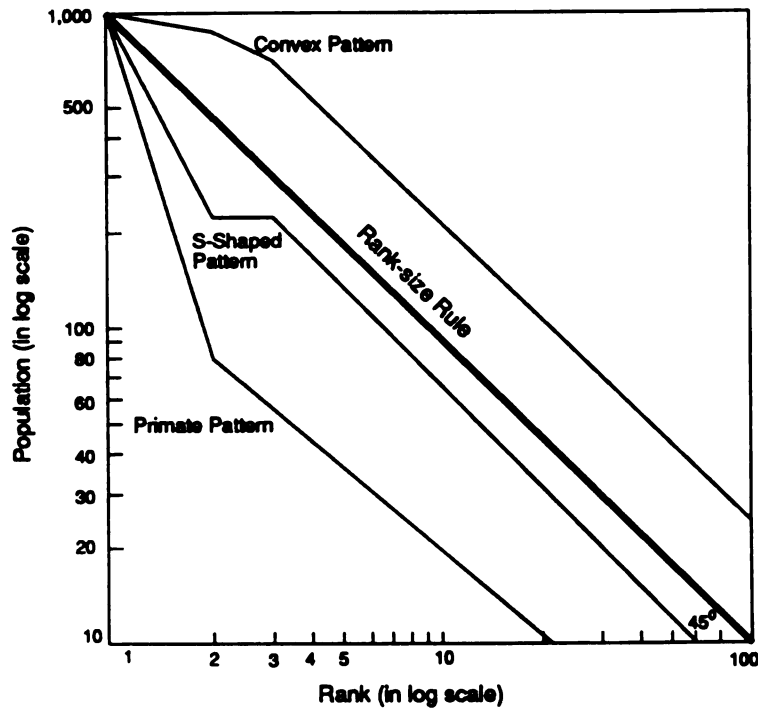
Figure 3.3. Patterns of city size distributions.

Rank-Mobility Index

The study of an entire urban system does not tell anything about the behavior of growth of individual cities. In order to understand the growth pattern of individual cities, the rank-mobility index developed by Marshall (1989)

is used. The rank-mobility index is given by the equation
stated below:

$$M = (R_0 - R_1)/(R_0 + R_1)$$

Where, M = rank mobility
R_0 = rank at the beginning of a given time period
R_1 = rank at the end of a given time period

In other words, the index is the difference between the
two rank positions, divided by their sum. The result is
positive if the city's rank rises and negative if it falls.
The theoretical limits of the index are -1.0 and +1.0, with
a value of zero signifying no change in rank. It is
considered that a city is doing well if its mobility index
for a particular period is +0.300 or higher, and doing
poorly if its index is -0.300 or lower (Marshall, 1989).

The computations were done using SYSTAT, version 5.01.
All the cities are classified into four groups in terms of
their rank mobility as indicated below:

Group	Index value for 1901-1981
1. No net change	Zero (.000)
2. Minor change	Between -.300 and +.300
3. High degree of gain	Above +.300
4. High degree of decline	Between -.300 and -.500
5. Very high degree of decline	Below -.500

Source of Data

Urban population data for the decades 1901 to 1981 are used in this study. The cities included in this study are those which according to the Bangladeshi government have fulfilled the criteria stated below and have populations above 5,000.

(a) A Municipality, a Town Committee, or a Cantonment Board.

(b) An urban area which has a population of at least 5,000 persons living in a continuous built-up area.

(c) Centers which have public utilities such as, roads, supply of electricity with street lights, water supply, sanitary arrangements, etc.

(d) Centers having trade and commerce facilities and non-agricultural population.

Bangladesh Censuses are conducted once in 10 years. As such, data for nine decades, from 1901 to 1981 are available and are used for analysis. The 1971 Census was interrupted by the liberation war and was later conducted in 1974. The data sources for this study are: (1) Census data of Pakistan 1961 for urban population 1901-1961, (2) Population Census of 1974, and (3) Population Census of Bangladesh, special report on Urban Areas, 1987.

CHAPTER IV

RESEARCH RESULTS

Introduction

The purpose of this study is to examine the structural effects of colonization on city-size distribution and how the policies of independent Bangladesh impacted subsequent patterns and trends of urbanization in the country. In relation to that purpose, the following questions were raised: (a) what changes have taken place in the distributional patterns of urban places over the political history of Bangladesh? (b) has the urban system moved toward deconcentration (rank-size) or concentration (primacy) over time? (c) what is the spatial trend in the current urban system of Bangladesh?

The results are presented in three sections. First, rank-size relationship for the years 1901 to 1981 are presented along with rank-size plots. The plots are further examined by a second section which describes the results of regression for drawing inferences on the nature of the rank-size relation. The third section presents the rank-mobility indices and attempts to draw some inferences using the analysis.

The Rank-Size Plot

The rank-size plot is the first method used in the study to examine the development pattern of Bangladesh's urban system. The rank-size relationships were plotted keeping the rank of city on x-axis and the population on y-axis. Figure 4.1 shows the rank-size plots which exhibit a process of evolution of urban centers from 1901 to 1981. The plots represent rank-size distributions for nine decades (1901-1981).

It is clear from the plot (Figure 4.1) that rank-size relationships are not linear on a log-log scale. The observations made from Figure 4.1 are noted under five sections: (1) dual primacy, (2) discontinuity in the growth of Dhaka, (3) relative absence of mid-size cities, (4) rank-interchange, and (5) increase in the number of the urban centers.
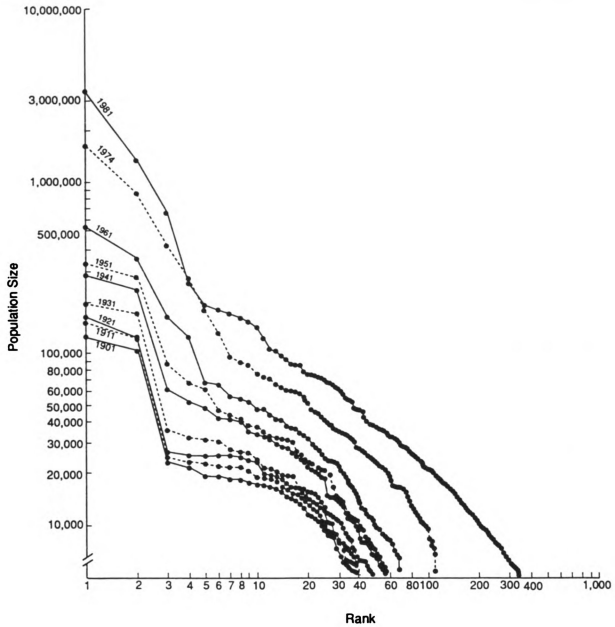
Figure 4.1.   Rank-size curves, 1901-1981.

1. Dual Primacy

From the Figure 4.1 it is observed that dual primacy existed during the decades 1901-1951 as indicated by flat upper sections of rank-size curves. These two cities were Dhaka and Chittagong. Strong duality can be seen in 1911, 1931, and 1941. This dual primacy diminished after 1951 and the primacy of Dhaka city had increased (Figure 4.1). These variations in the degree of dual primacy can be observed from the variations in the rates of growth of Dhaka and Chittagong as presented in Table 4.1.

Table 4.1.- Growth rates of Dhaka and Chittagong, 1901-1981.

Year	Dhaka		Chittagong	
	Population	% Increase	Population	% Increase
1901	128857	-	106848	-
1911	153609	19.20	125226	17.2
1921	168510	9.70	125968	15.27
1931	196111	16.38	173577	37.79
1941	295735	50.80	224732	29.47
1951	335928	13.59	289981	29.03
1961	555712	65.42	364205	25.60
1974	1679572	202.24	889760	144.3
1981	3440147	104.82	1390684	56.3

The variation of the growth rate of these two cities are graphically represented in Figure 4.2 for a visual examination.
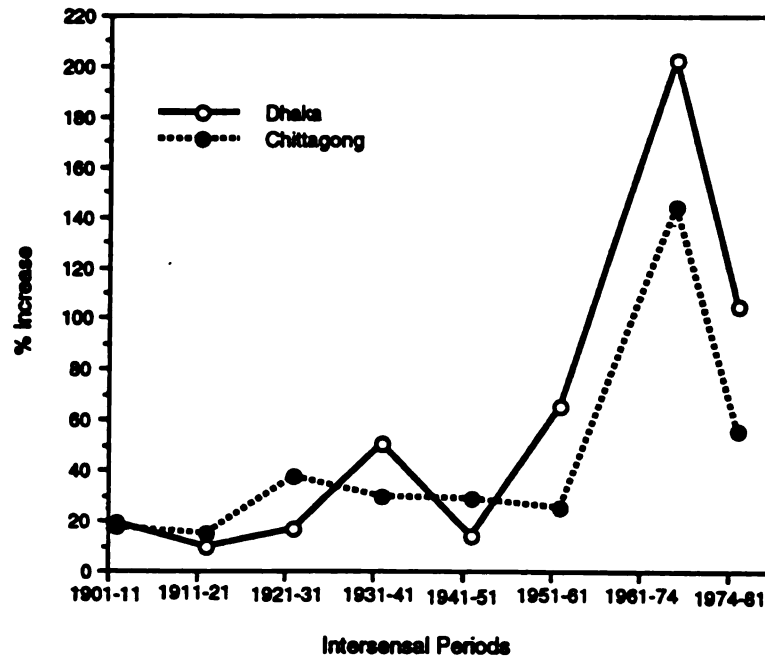
Figure 4.2. Growth of Dhaka and Chittagong, 1901-1981.

Historically, Dhaka and Chittagong have always been the main cities of Bangladesh. Dhaka due to its advantageous central geographical location in the country and also due to its proximity to natural resources such as the tea gardens. In addition, the fine cotton fabric industry located in the city has also made it prominent at all times. Chittagong, though has always been a port city even before 1901, was officially declared a port city only in 1930. Chittagong has long been the only sea-port in the country and its functions were concomitant to a process of greater internal interdependence of cities, and its economic importance was dependent on the export of jute and other raw materials and some important functions. The British also had developed Chittagong in order to facilitate shipping of jute, rice,

and tea to foreign countries. As such, from 1930 Chittagong caused an increase in the duality in Bangladesh.

The importance of Chittagong diminished in 1950, boosting Dhaka's primacy. This conforms with Elahi's study that Chittagong lost its functional monopoly after the establishment of another sea-port near Khulna and expansion of river-ports such as Narayanganj and also Chandpur.

In 1981, Dhaka had a relatively higher rate of growth compared to Chittagong further diminishing that dual primacy and the tendency toward primate city dominance. The existence of dual primacy is common in South Asian countries; for example, in India, Calcutta and Bombay, in Pakistan, Karachi and Lahore (Dutt, 1983). Harris (1970) noted that the existence of two or several large cities is suggestive of lack of full spatial integration.

2. Discontinuity in the Growth of Dhaka

The first ranked city which is Dhaka, the capital city of Bangladesh, shows a continuous growth from 1901 to 1981. It can be noted from the plot (Figure 4.1) that the growth of population of Dhaka was very slow between 1911 and 1921 and very rapid between 1961 and 1974. The population growth rates for Dhaka are listed in the Table 4.1 and compared with the observations made from the Figure 4.2.

49

Table 4.2. - Growth of population of Dhaka, 1901-1981.

Year	Population	% Increase
1901	128857	-
1911	153609	19.20
1921	168510	9.70
1931	196111	16.38
1941	295735	50.80
1951	335928	13.59
1961	555712	65.42
1974	1679572	202.24
1981	3440147	104.82

The growth of Dhaka which is indicated by the increment on y-axis shows slow growth during the British period (1901-1951), rapid growth during the Pakistani era (1951-1974), and very rapid growth in the early period of independent Bangladesh (1974-1981). It is clear that in the earlier decades from 1901 to 1941, the urban population growth was slow, especially between 1911 and 1921.

It is also seen from Table 4.1 that between 1911 and 1921, the increase in population of Dhaka was 9.7 percent compared to the previous decade's 19.2 percent (Table 4.2). This is also shown by the very small increment on the y-axis for the 1921 curve (Figure 4.1). In 1912, the East Bengal State (the present Bangladesh) was merged with the West Bengal State which resulted in Dhaka losing its prominence.

After the establishment of Dhaka university in 1921 and development of infrastructures by the government, growth incentive came back for Dhaka and it continued to grow until

1974 when it reached the peak increase of 203 percent. This rapid growth of Dhaka fell to 105 percent in 1981. This trend may be explained by the observation of Mamun (1982) that in 1971, after the liberation war the law and order in rural areas and small towns had deteriorated causing migration of rural population to large cities which were considered safer. A large number of people who had collaborated with the Pakistanis fled to the central or regional cities. Also, because of the rapid shift in socioeconomic conditions after the violent political changeover, many individuals chose to start anew in an urban setting; members of a rural or small-town elite were conspicuous in this group. The rapid growth which occurred in 1971 as an immediate effect of the liberation war decreased in 1981 when migration slowed. These may be the main causes for the slow-down in Dhaka's growth. A slow down in the growth of Dhaka had also occurred in 1951 which may be attributed to the fact that a large suburban section of Dhaka city was separated and given the status of a city under the name Narayanganj.

3. Relative Absence of Mid-Size Cities

The rank-size plot (Figure 4.1) also exhibits clearly the lack of medium size cities in the urban system in the beginning of the century as indicated by the steep slope or sharp decline in the rank-size curves. In 1921, urban

centers having population of 25,000-49,999 and from 1941, centers with population of 50,000-99,999 started to grow up.

The absence of mid-size cities prior to 1941 shows an uneven urbanization process during the British period. As Fisher (1989) commented, lack of spatial integration reflected by the absence of mid-size cities may be the result of the spatial layout of India's production and circulation system made by the British. This urban system during the early decades of this century may have contributed to the subsequent patterns of urban development dominated by Dhaka.

4. Rank-Interchange

From Figure 4.1 it is seen that the curves of smaller urban centers for 1901 to 1931 overlap suggesting rearrangement in the ranking of the towns. Between 1961 and 1981, small urban centers exhibited a balanced and higher growth which is reflected by the parallel and widely spaced curves for small urban centers. One interesting feature for the rank-size lines of 1974 and 1981 is the crossing of 4th and 5th ranking cities, Narayanganj and Rajshahi. It is also noted from Figure 4.1 that the curves of 1971 and 1981 meet at ranks four and five. The cities which are represented by these meeting points are Narayanganj, Rajshahi, and Mymensingh. This situation may be explained by the fact that Narayanganj which ranked four in 1974 was merged with Greater Metropolitan Dhaka in 1981 leaving its

rank to Rajshahi. The city Mymensingh which ranked five in 1974 also ranked five in 1981 with very little population growth.

5. Increase in the Number of Urban Centers

The horizontal expansion in the rank-size plot indicates an increase in the number of centers (Figure 4.1). This horizontal increase is more prominent for the census years 1974 to 1981 suggesting a growth of a large number of urban centers during this period. In the year 1974, there were only 104 urban centers having a population of 5,000 and above. In 1981, this number increased to 322. This increase in the number of urban centers is the result of the Bangladeshi governments national decentralization policy.

From the above discussion it may be concluded that the rank-size relationships among urban centers in Bangladesh are not linear on a log-log scale. In the early decades, the urban population growth was rather slow specially during 1911-1921 which was a discontinuity in the urban growth. But, the growth was rapid from 1951 which may be attributed to the development of Dhaka's infrastructures. In the Bangladeshi urban system, dual primacy had existed during 1901-1951 and thereafter diminished. The rapid growth of Dhaka and Chittagong becoming relatively less important due to the emergence of Khulna as a port city after 1951 may explain the decline in the duality. During the British period the urban system clearly lacked in medium size cities

53

which may have contributed to the subsequent pattern of urban system dominated by Dhaka.

It is seen that the rank-size relationships have not been stable through the decades which may be attributed to the political changes this region has experienced. The bottom-up development policy of the Bangladeshi government has clearly resulted in a substantial increase in the number of the urban centers contributing to an integrated spatial system.

Regression Results of Rank-Size Plots

The rank-size relationships as observed in the previous section highlight the effects of change in the relative distribution of the urban system. Wubneh (1982) suggested that in order to understand and appreciate the magnitude of shifts in ranks, the relative change in rank-size relationships over time needs to be ascertained. This can be achieved by examining the change in the parameters between rank and size of cities in a regression framework (Wubneh, 1982). This approach is strongly suggested by Carroll (1982) also. As such, the rank-size plots are further examined by a regression analysis for drawing inferences on the nature of the rank-size relation.

A regression analysis was performed using the equation (4): $log\ P_r = a + b\ log\ r$ for the nine census years, 1901 to 1981. The results of this analysis are presented in Table 4.3.

Table 4.3. - Results of regression.

Year	a (intercept)	Change in a	b (Slope)	Change in b	R^2	Sign. Level
1901	11.539	-	-0.783	-	0.899	0.000
1911	11.689	0.150	-0.792	0.009	0.897	0.000
1921	11.795	0.106	-0.807	0.015	0.910	0.000
1931	12.059	0.264	-0.861	0.054	0.934	0.000
1941	12.616	0.557	-0.949	0.088	0.954	0.000
1951	12.879	0.263	-0.999	0.050	0.952	0.000
1961	13.263	0.384	-1.031	0.032	0.971	0.000
1974	13.978	0.715	-1.044	0.013	0.974	0.000
1981	14.307	0.329	-0.968	0.076	0.985	0.000

Table 4.3 displays estimates and shows significant changes in the temporal progression of the coefficients both for intercept (a - size of the largest city) and the slope (b - relative change in rank). The patterns manifested in this temporal progression of coefficients are identified and discussed below under four sections: (1) overall pattern, (2) early pattern, (3) mid-period pattern, and (4) late pattern.

Overall Pattern

The regression results in Table 4.3 show that the negativeness of b-coefficients has increased over time except for 1981. This indicates a tendency toward concentration until 1974 and thereafter deconcentration till 1981.

The steady relative rapid increase in the size intercept (Table 4.3) indicates a continuous growth of

primacy in the Bangladeshi urban system. As seen in the rank-size plot (Figure 4.1), Dhaka has always maintained its first place in the urban system. A graph is plotted between b-coefficients and the corresponding years for a closer look at the variations in b-values over time (Figure 4.3).
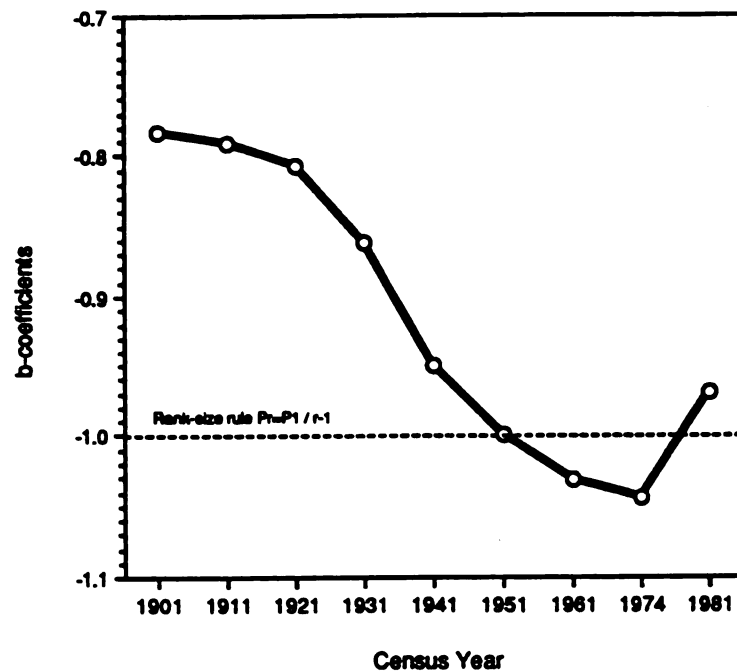
Figure 4.3.   Slope coefficients (b) for the rank-size relationships.

The rank-size relationship curve in Figure 4.3, progressively approaches the rank-size position of b = -1.00. Then from 1951 to 1974 the curve continues to fall below -1.00 approaching a primate pattern. But, for 1974 to 1981 the curve moves upwards crossing the -1.00 value. The

variations in the slopes of the urban system is plotted in Figure 4.4.
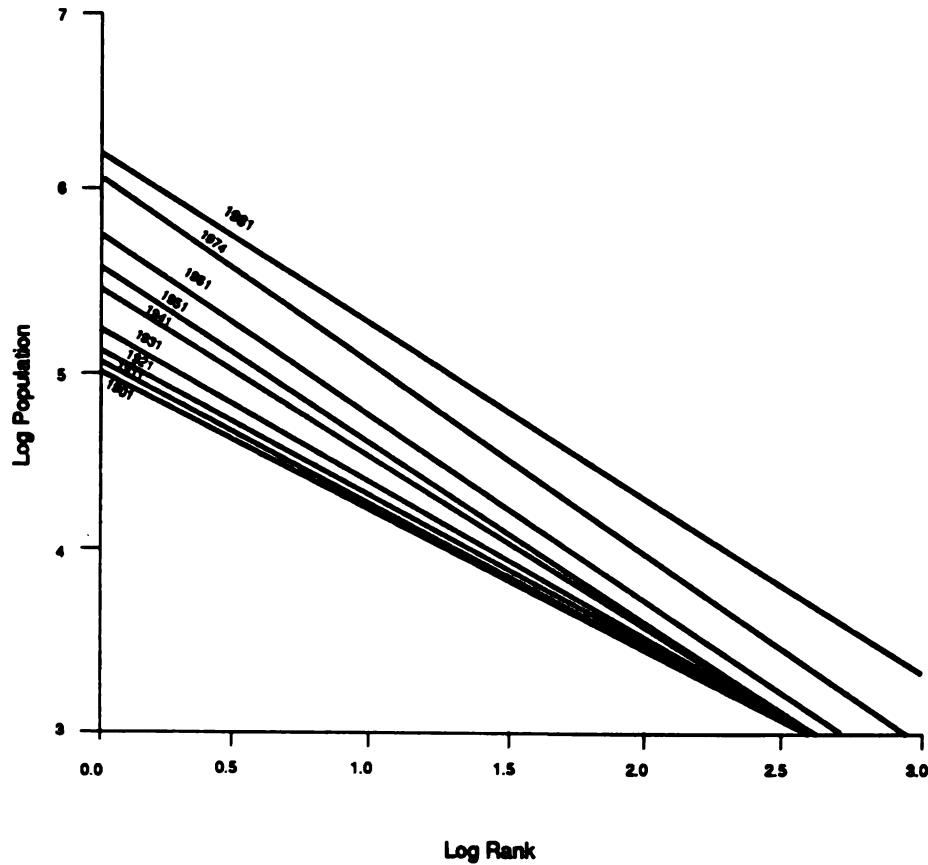
Figure 4.4.   Variations of slopes for urban centers, 1901-
            1981.

From Figure 4.4 it is seen that the slopes have steadily increased from 1901 to 1974.   The increase is more prominent from 1901 to 1951.   From 1974 to 1981, the slope has declined which can be seen from the dispersion of the slope on the x-axis.

From the above observations it is evident that the development of the urban system in Bangladesh has not been

diachronically monotonic. It is marked with variations.
There existed a favorable city-size distribution in 1951 (b
= -1.00) and then a tendency towards concentration with
primacy until 1974 and a reversal of that trend after 1974.

Early Pattern

The period 1901 to 1951 was associated with the British
rule over this region. It is noted from Figure 4.2 that the
absolute values of the b-coefficients which are quite below
1.00 for 1901 and 1911 have progressively approached 1.00 in
1951. It indicates the existence of several large urban
centers in the system until 1951. This is also clear from
Figure 4.1. Dhaka and Chittagong were dominating the urban
system during this period of time, which is noted as dual
primacy.

It is further noted from Table 4.2 that from 1901 to
1941, the decennial increment in the intercepts is very
small indicating a small rate of increase in the population
of the largest city Dhaka.

Mid-Period Pattern

The results of regression analysis have shown that for
the period 1951 to 1974, the years associated with the
Pakistani regime, the b-coefficient has become more
negative. This indicates a tendency of primate pattern in
the city-size distribution. But for 1951, the early part of
the Pakistani rule, the b-value is .999. This shows a close

rank-size distribution pattern in 1951. But the absolute b-value increased to -1.031 suggesting a drift towards a more primate pattern. This according to the model indicates concentration of population in one large city.

From Table 4.2 it is also noted that there is a large increase in the intercept for 1951 to 1974 which indicates primacy condition in the urban system. This may be seen as a result of the Pakistani government investing heavily for development of industries including Chittagong and Khulna.

Late Pattern

The Bangladeshi period started in the year 1971 after the Pakistani regime. From Table 4.2 and Figure 4.3 it is noted that the b-coefficient is decreased between 1971 and 1981. It indicates a deconcentration trend in the urban system. Deconcentration occurred after 1971 as a result of creation of a large number of regional growth centers under the decentralization policy of the Bangladeshi government. This observation is in agreement with the observation made from Figure 4.1 which shows a large horizontal expansion of the curve for 1981. It is also seen that the intercept has increased from 1971 to 1981. This indicates an increase in the population of the primate city Dhaka and at the same time growth of smaller centers in the urban system of Bangladesh.

The study has indicated that during this period the relative growth of population in the second city Chittagong

decreased compared to Dhaka. This is reflected by the relatively steeper slope of 1971 at the upper portion of the rank-size line (Figure 4.1). This trend continued till 1981.

The R^2 values for 1974 and 1981 (.974 and .985 respectively) are higher than the corresponding values for the preceding years suggesting a higher linearity in the rank-size relationship. This also indicates higher spatial integration (Harris, 1970).

Urban Patterns Analyzed Using The Rank-Size Mobility Index

The relative performance of growth of individual cities have been examined by looking at changes in rank. Table 4.4 presents an analysis of the changes in rank experienced by Bangladeshi towns during British, Pakistani, and Bangladeshi regimes in terms of rank-mobility indices. The Table 4.4 lists the cities, ranks, and their indices from 1901 to 1981 for the nine census years. All towns that had 5,000 or more inhabitants in 1901 are included and the table lists these thirty-eight places in rank order according to their sizes in 1901. The ranking of cities for decades 1901-1961 are based on the data from the Census Commission of the Pakistan government. The ranks of 1971 and 1981 are according to the data published by the Bangladesh government. The ranks of these towns are recorded at intervals of ten years.

As discussed before, Marshall's (1989) rank-mobility index is positive if the city's rank rises and negative if

it falls (see the methods section for details). To understand the dynamics of rank-order change, the ranks of these cities over the period 1901 to 1981 are plotted in Figure 4.5. In the Figure 4.5, the black lines indicate increase in rank and gray lines show decrease in rank.

From Figure 4.5, it may be seen that the rank-order lines for smaller cities criss-cross much more than for larger cities suggesting a high degree of instability in the lower ranks of central places.

Table 4.4. Rank mobility of Bangladesh's urban centers, 1901-1981.

City	Rank									Mobility								
	01	11	21	31	41	51	61	74	81	01-11	11-21	21-31	31-41	41-51	51-61	61-74	74-81	01-81
Dhaka	1	1	1	1	1	1	1	1	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Chittagong	2	2	2	2	2	2	2	2	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Serajganj	3	3	5	4	6	10	10	11	13	0.000	-0.250	0.111	-0.200	-0.250	0.000	-0.001	-0.001	-0.625
Rajshahi	4	4	8	7	7	8	7	6	4	0.000	-0.333	0.067	0.000	-0.067	0.001	0.001	0.001	0.000
Brahmanbaria	5	8	9	9	9	9	12	14	17	-0.231	-0.059	0.000	0.000	0.000	-0.002	-0.001	-0.002	-0.545
Comilla	6	6	4	5	5	5	8	9	6	0.000	0.200	-0.111	0.000	0.000	-0.002	-0.001	0.002	0.000
Barisal	7	7	3	3	3	3	5	7	7	0.000	0.400	0.000	0.000	0.000	-0.001	-0.001	0.000	0.000
Pabna	8	11	12	11	11	14	13	15	12	-0.158	-0.043	0.043	0.000	-0.120	0.001	-0.001	0.002	-0.200
Jamalpur	9	9	10	10	13	17	15	17	15	0.000	-0.053	0.000	-0.130	-0.133	0.001	-0.001	0.001	-0.250
Madaripur	10	12	6	8	16	24	24	36	30	-0.091	0.333	-0.143	-0.333	-0.200	0.000	-0.006	0.003	-0.500
Nawabganj	11	5	23	20	19	21	21	23	16	0.375	-0.643	0.070	0.026	-0.050	0.000	-0.001	0.003	-0.185
Tangail	12	15	20	19	20	22	28	19	19	-0.111	-0.143	0.026	-0.026	-0.048	-0.003	0.004	0.000	-0.226
Kishoreganj	13	13	11	22	22	26	27	30	34	0.000	0.083	-0.333	0.000	-0.083	-0.001	-0.001	-0.002	-0.447
Rangpur	14	14	13	13	10	16	14	12	9	0.000	0.037	0.000	0.130	-0.231	0.001	0.001	0.002	0.217
Mymensingh	15	10	7	6	4	6	9	5	5	0.200	0.176	0.077	0.200	-0.200	-0.002	0.002	0.000	0.500
Pirojpur	16	23	21	29	30	29	37	50	75	-0.179	0.045	-0.160	-0.017	0.017	-0.004	-0.006	-0.012	-0.648
Sylhet	17	18	16	12	15	12	16	18	8	-0.029	0.059	0.143	-0.111	0.111	-0.002	-0.001	0.005	0.360
Dinajpur	18	16	14	15	14	11	17	16	14	0.059	0.067	-0.034	0.034	0.120	-0.003	0.001	0.001	0.125
Sherpur	19	17	15	14	18	25	26	31	37	0.056	0.063	0.034	-0.125	-0.163	-0.001	-0.003	-0.003	-0.321
Faridpur	20	20	19	21	17	18	22	22	27	0.000	0.026	-0.050	0.105	-0.029	-0.002	0.000	-0.002	-0.149
Netrokona	21	19	28	28	28	32	34	43	50	0.050	-0.191	0.000	0.000	-0.067	-0.001	-0.004	-0.003	-0.408
Khulna	22	21	17	16	12	7	4	3	3	0.023	0.105	0.030	0.143	0.263	0.002	0.001	0.000	0.760
Bajitpur	23	25	25	25	27	31	42	74	121	-0.042	0.000	0.000	-0.038	-0.069	-0.006	-0.016	-0.023	-0.681
Chandpur	24	22	18	17	8	15	18	20	18	0.043	0.100	0.029	0.360	-0.304	-0.002	-0.001	0.001	0.143
Kotchandpur	25	30	32	43	49	51	53	68	102	-0.091	-0.032	-0.147	-0.065	-0.020	-0.001	-0.007	-0.017	-0.606
Natore	26	29	29	35	36	37	39	53	63	-0.055	0.000	-0.094	-0.014	-0.014	-0.001	-0.007	-0.005	-0.416
Satkhira	27	24	26	27	26	28	31	25	35	0.059	-0.040	-0.019	0.019	-0.037	-0.002	0.003	-0.005	-0.129
Jessore	28	27	27	26	25	20	11	10	10	0.018	0.000	0.019	0.020	0.111	0.005	0.001	0.000	0.474
Bogra	29	26	24	23	21	19	19	21	26	0.055	0.040	0.021	0.045	0.050	0.000	-0.001	-0.002	0.055
Noakhali	30	31	31	24	24	27	32	35	31	-0.016	0.000	0.127	0.000	-0.059	-0.003	-0.001	0.002	-0.016
Muktagacha	31	32	35	42	41	49	55	84	132	-0.016	-0.045	-0.091	0.012	-0.089	-0.003	-0.014	-0.023	-0.620
Saidpur	32	28	22	18	23	4	6	8	11	0.067	0.120	0.100	-0.122	0.704	-0.001	-0.001	-0.002	0.488
Meherpur	33	37	40	41	43	46	60	63	88	-0.057	-0.039	-0.012	-0.024	-0.034	-0.007	-0.001	-0.012	-0.455
Debhata	34	38	39	48	51	55	74	-	461	-0.056	-0.013	-0.103	-0.030	-0.038	-0.009	0.036	-0.233	-0.863
Kushtia	35	35	30	31	29	23	25	29	21	0.000	0.077	-0.016	0.033	0.115	-0.001	-0.002	0.004	0.250
Hobiganj	36	33	38	36	33	36	42	62	86	0.043	-0.070	0.027	0.043	-0.043	-0.003	-0.010	-0.012	-0.410
Jhalokati	37	36	37	38	38	39	47	52	61	0.014	-0.014	-0.013	0.000	-0.013	-0.004	-0.002	-0.004	-0.245
Patuakhali	38	34	34	39	34	38	40	41	38	0.056	0.000	-0.068	0.068	-0.056	-0.001	-0.000	0.001	0.000
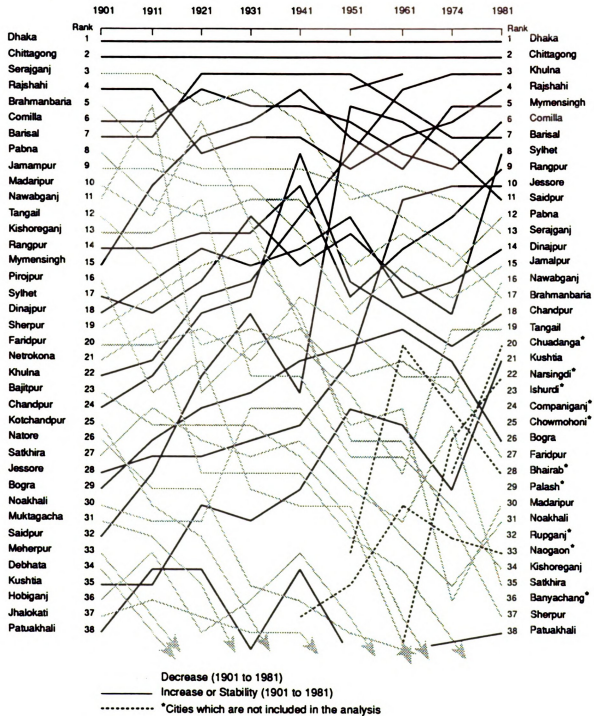
Figure 4.5.   Rank-size changes, 1901-1981.

Classification of Cities by Rank-Mobility (M) Index

All the 38 cities included in this study are classified
into five groups in terms of there rank mobility using the
following criteria:

Group	Index value for 1901-1981
1. No net change	Zero (.000)
2. Minor change	Between -.300 and +.300
3. High degree of gain	Above +.300
4. High degree of decline	Between -.300 and -.500
5. Very high degree of decline	Below -.500

The classification of the cities under the above groups
is presented in Table 4.5. It is noted that out of the 38
cities with population above 5,000 in 1901, 14 have indices
below -.300, which suggests that these are doing poorly in
terms of rank stability. Further, out of the 13 downward
moving cities, 8 cities have indices below -.500 suggesting
severe decline of the cities. It is noted that 5 of these
severely affected cities are situated west of Dhaka

Table 4.5. Classification of urban centers according to rank-mobility indices.

NO NET CHANGE (Index: .000)			MINOR CHANGE (Index: -.300 to +.300)			HIGH DEGREE GAIN (Index: >.300)			HIGH DEGREE DECLINE (Index: -.300 to -.500)			VERY HIGH DECLINE (Index: <-.500)		
Urban Centers	Population 1981	Location	Urban Centers	Population 1981	Location	Urban Centers	Population 1981	Location	Urban Centers	Population 1981	Location	Urban Centers	Population 1981	Location
Dhaka	3,440,147	Central	Pabna	109,065	Northern	Khulna	652,000	Southern	Kishoreganj	23,677	Central	Brahmanbaria	109,065	Eastern
Chittagong	1,390,684	Eastern	Dinajpur	96,718	Northern	Mymensingh	190,911	Central	Sherpur	48,214	Northern	Sherajganj	106,774	Northern
Rajshahi	253,726	Northern	Jamalpur	91,815	Central	Sylhet	162,571	Eastern	Netrokona	37,455	Central	Madaripur	63,388	Southern
Comilla	184,132	Eastern	Nowabganj	87,724	Northern	Jessore	148,927	Southern	Natore	31,210	Northern	Pirojpur	27,531	Southern
Barisal	172,905	Southern	Chandpur	85,656	Eastern	Saidpur	126,608	Northern	Meherpur	23,573	Southern	Kochandpur	20,594	Southern
Patuakhali	48,121	Southern	Tangail	77,518	Central	Hobiganj	23,677	Eastern				Bajitpur	17,620	Central
			Kushtia	74,892	Southern							Muksugacha	16,292	Central
			Bogra	68,749	Northern							Debhata	1,481	Southern
			Faridpur	66,579	Central									
			Rangpur	66,579	Northern									
			Noakhali	59,065	Eastern									
			Satkhira	36,271	Southern									
			Jhalokati	32,539	Southern									

between Calcutta and Dhaka city. Then, 5 have indices above +.300, which indicates that they are doing well. On the basis of the above observations, it is also noted that stability varied from city to city. The shift in rank-order for small cities is considerably higher compared to that for larger cities. It is also noted that the top ranking cities continued to maintain their higher status.

In Figure 4.5, the top two horizontal lines represent the two cities of Dhaka and Chittagong continue to dominate the urban system or they never experienced negative mobility during the study period.

Cities Showing Unique Pattern of Performance

Four of the cities included in this study have shown unique patterns of performance in rank maintenance. Dhaka continued to dominate the urban system by maintaining its first position; Khulna showed highest upward mobility; Debhata showed highest downward mobility; and Barisal which had experienced both upward and downward mobility during the study period finally attained the rank it had in 1901. These four cities are further discussed below:

Dhaka:

The index of Dhaka being 0 (zero) indicates a steady growth and rank stability overtime. The growth pattern analysis of this ever-growing city has shown that its growth has remained stable overtime. Dhaka, as the capital and

premier city, is centrally located in the country on the
left bank of the Buriganga river, a tributary of the Meghna-
Ganges system. It is an old city and is established since
the seventh century A.D. At that time it was known as
Bengalla, a small marketing town with its center near the
present Bangla Bazar (Dutt, 1983). Dhaka showed a
continuous growth since 1947 when British was partitioned
and Pakistan was created. Since 1947, Dhaka grew very fast
in population and areal extent as the capital of the eastern
region of Pakistan and more as the capital of an independent
country since 1971. Before 1947, Dhaka city was a district
headquarter and a university town. There was one glass
factory, two match works, one cotton textile mill, one
general engineering works, and one pharmaceutical
manufacturer. There was no industrial area.

After 1947, Dhaka became the provincial capital of the
then East Pakistan and was the chief administrative and
business center of the province. The main capital was at
Islamabad in West Pakistan (now Pakistan). The two
provinces were separated by about 1,000 miles of the Indian
territory. The physical separation induced to open
embassies and consulates of a number of countries in Dhaka.
Almost all commercial firms that are worth the name in the
province had their offices in the city. Today's three well
defined industrial areas: Tejgaon, Postogola, and
Hazaribagh were established in the Pakistani period. Also,
a number of industrial establishments, both large and small

had increased. Besides, Dhaka occupied a key position in Pakistan as a major center for imparting technical training and university teaching and research. Also, the Pakistani government developed a large number of residential and commercial areas. In this time, large-scale immigration of Muslims from India contributed to the rapid population increase. The establishment of jute and other manufacturing industries has also contributed to the city's growth. This multifarious growth of administrative-commercial activities became pull factors for the migrants from the rural areas and smaller towns. During this time, population had increased by 64 percent. Dhaka has been experiencing its rapid growth since its independence in 1971. It is the tenth-ranking city in South Asia and is also one of the fastest-growing cities in the region.

Khulna:

The positive index value .760 for Khulna indicates a steady growth. Also, as seen in the Table 4.3, in the year 1901, this city had occupied 23rd place in the urban system and in the year 1981 it came to a third place. This overall increase in status may be attributed to the development of this city as an important sea port and an industrial center by the Pakistani government. This is evident from the increased index (.263) for the period 1951-61 (Table 4.4).

Debhata:

This city has the highest negative rank-mobility index (-.863) which suggests highest downward movement in the urban system. It is seen from the Figure 4.5 that it has experienced a continuing decline in the rank order irrespective of the regime in power. This severe decline was due to lack of industrial, commercial, and administrative functions.

Barisal:

Though its rank-mobility index is zero, it has experienced both rise and fall in its rank status as may be noted from Table 4.3. From 1911 to 1921, it had moved from rank 7 to rank 3. It maintained its rank till 1951 and started to decline reaching the rank 7 again in the year 1974 and thereafter maintained the same status till 1981. The Census of Pakistan (1961) also noted this declining trend of Barisal. The fall in rank in 1951 when the Pakistan government took over, could be mainly because it remained in the shadow of Khulna a city 50 miles away from Barisal, which caused out-migration. However, it moved back to its original rank 7 in 1981. It is not very clear as to what factors have contributed to this upward movement.

An analysis of change of rank-order or the growth pattern, using the 'rank-order mobility index' (Table 4.3) has shown that stability varied from city to city. The

shift in rank-order for small cities is considerably higher compared to that for larger cities.

It is also seen that the variations in the stability have some correspondence with the change of regime that came into power over time. Nearly 37 percent of the cities have shown a declining trend (index below -.300) over the years. It is also noted that 57 percent of them have severely declined (index below -.500) and are mostly in the western part of Bangladesh, situated between Dhaka and Calcutta cities. Islam (1971) through his study of growth of the urban centers also found that the number of declining centers have generally been in the western part than in the other areas. Islam suggests that one reason for this pattern is that these centers are located in low-lying and ill-drained areas. This phenomena may also be explained by the disruption of nodality of communication which existed during the British time.

CHAPTER V

SUMMARY AND CONCLUSION

The purpose of this study was to analyze the structural changes of the urban system in Bangladesh over time, and to examine whether the rank-size trend is toward more concentration (primacy) or deconcentration (convergence in rank-size) 1901-1981. The analysis of the growth pattern was done using the data available from decennial censuses conducted by the governments of India, Pakistan, and Bangladesh from 1901 to 1981. The criteria for defining urban centers are the same as those used by the Bangladesh government. Analysis was conducted using the following qualitative and quantitative methods: (1) rank-size plots, (2) rank-size regression, and (3) rank-mobility index (M).

Graphics and tables have been used to present the results on the rank-size plots for nine census years. Regression results were based on log population of central places used as the dependent variable and log rank as the independent variable. The findings of this study are presented in three sections: (1) historical development of rank-size relationships of urban centers in the urban system, (2) structural Changes in the urban system, and (3) growth patterns of selected urban centers.

Historical Development of Rank-Size Relationships
of Urban System

During the years 1901-1981 Bangladesh went through

three major political changes: (1) the British period

(1901-1947), (2) the Pakistani period (1947-1971), and

(3) the independent Bangladeshi period (1971-Present). The

study has revealed that the city-size distribution pattern

is well marked by the above political changes.

The British period is characterized by dual primacy of

Dhaka and Chittagong the two largest cities of Bangladesh.

During the British time, Dhaka was used as a center for

collecting raw materials. Chittagong as a sea port for

trading of rice, jute, and tea. It is also observed that

there was no medium size city during this period which had

resulted in an uneven urbanization. These observations

confirm that colonial rule had laid a foundation of primate

city development by putting more emphasis one or two cities.

Such institutional and functional barriers hampered a

balanced growth of the urban system in Bangladesh.

During the period of Pakistani occupation, dual primacy

diminished and a third city Khulna started emerging as an

important city in the urban system. Population

concentration in Dhaka began to take place. From 1961

onwards, a tendency towards a "balanced" growth of urban

centers, i.e., existence of secondary cities, had emerged.

This observation may be explained by the fact that during

the Pakistan period importance for smaller urban centers was

growing resulting in a situation that narrowed down the gap

between the expected and the actual population in those
centers. This study has also revealed that during the
Pakistan period the growth of large cities was greater than
the corresponding growth during the British period. This
may be seen as a result of the Pakistan government investing
heavily for development of industries in Dhaka, Chittagong,
and Khulna.

The study has indicated that during the Bangladeshi
period the relative growth of population in the second city
Chittagong decreased compared to Dhaka resulting in a
further decline of the dual primacy. This trend had
continued till 1981. From 1974 to 1981, a trend toward
deconcentration had set-in. However, the population of
Dhaka city had increased during the period and at the same
time a trend toward a higher spatial integration began to
appear.

Reduction of the duality during the Bangladeshi period
may be explained by the fact that in this period Dhaka
became the capital city of independent Bangladesh as opposed
to being only a provincial capital during the earlier
regimes. During the Pakistan time, Islamabad, the capital
of Pakistan was the focus of international interests and it
eclipsed the importance of Dhaka. With the emergence of
independent Bangladesh, Dhaka began to receive an
international status. Nonetheless, concentration slackened
during this period owing to the growth of several urban
centers under the decentralization policy of the Bangladeshi

government covered by the Second Five Year Plan (1980-1985).
Under the decentralization policy, the government of
Bangladesh has given special attention to the development of
small urban centers which serves the purpose of promoting
grass-roots development.

The historical development of city rank-size
relationships shows clearly the structural effect of the
policies of the British, the Pakistani and independent
Bangladeshi over the years beginning in 1901. The major
observations noted in this area relate to <u>concentration</u>,
<u>duality</u>, <u>rank-size</u>, and <u>deconcentration</u>. This study has
revealed that during the British period a tendency towards
<u>concentration</u> was in the process of emergence which truly
manifested itself in the Pakistani period and continued till
the early stages of the Bangladeshi period. <u>Duality</u> which
was strong during the British regime, diminished during the
Pakistani regime and further diminished during the
Bangladeshi period. <u>Rank-size</u> or "balanced" growth of the
urban system was practically absent during the British
period but had begun to manifest itself in the Pakistani
period and became prominent in the Bangladesh period. A
process of <u>deconcentration</u> had set-in in 1981 as the
concentration trend began to diminish with the emergence of
Bangladesh as an independent nation. This deconcentration
may be attributed to the decentralization policy of the
Bangladeshi government.

Structural Change in the Urban System

This study has revealed that the urban system in Bangladesh had gone through three important structural changes during the period 1901-1981. These changes are punctuated by dual primacy, primacy, and decentralization.

During the census years 1901 to 1941, the Bangladeshi urban system manifested dual primacy. This confirms the findings by Elahi (1972). Berry (1972), however, found no duality in the Bangladeshi urban system. Historically, Dhaka has always been the main city of Bangladesh due to its advantageous geographical location in the country and also due to its proximity to natural resources like the tea plantations. In addition, the fine cotton fabric industry located in the city has added to its prominence. Chittagong has always been a port city even before 1901, but increased its function when the British regime developed it for shipping rice, jute, and tea. It became a port officially in 1928. As such, Chittagong's growth was boosted from 1930 onwards contributing to the duality of the urban system. It is only in the 1950s that Chittagong's importance diminished when Khulna's growth became rapid.

A move toward primacy in the Bangladeshi urban system is observed after 1950. Dhaka became a rapidly growing metropolis in Bangladesh and some of the services like administration, communication links, educational facilities, and centers of cultural interest were located more in Dhaka than in other centers. Another possible reason for the

increasing of primacy after 1950 was that Chittagong which was the major port, started loosing its prominence after the establishment of another sea port near Khulna and the expansion of the river-ports of Narayanganj and Chandpur.

This study has noted that during the period 1974 to 1981 there was a growth of a large number of small urban centers causing deconcentration. Deconcentration may be attributed to the policy of the government of Bangladesh as outlined in their Second Five Year Plan (1980-1985). This policy was based on restraining the rapid growth of large cities so as to ensure the distribution of development benefits to the rural areas. The policy aimed at mobilizing local communities to participate in national development.

Patterns of Changes in Rank-Order

This study has shown that rank-stability varied from city to city. It is also seen that the variations in the rank-stability have some correspondence with the change in political regimes that came into power in Bangladesh from 1901 to 1981. Dhaka, Chittagong, Rajshahi, Comilla, Barisal, and Patuakhali have experienced no net change in terms of rank-mobility during the period 1901-1981. But Dhaka and Chittagong maintained first and second ranks throughout these periods. As primate and second largest cities, Dhaka and Chittagong had always higher populations than other cities. As such, even when there was some decline in the growth of these cities, the smaller cities

were unable to overtake them in terms of their population. Mymensingh and Khulna showed a high degree rank-mobility. Development of Khulna as a port city and Mymensingh's metropolitan developments explain this change.

Nearly 40 percent of the cities have a downward rank mobility trend over the years. It is also noted that about 60 percent of them have showed a severe downward trend. Most such cities are located in the western part of Bangladesh between Dhaka and Calcutta cities.

Four cities were selected to demonstrate some typical patterns of rank-mobility. Dhaka continued to dominate the urban system by maintaining its first position; Khulna showed highest upward mobility; Debhata showed highest downward mobility; and Barisal which had experienced both upward and downward mobility during the study period finally attained the rank it had in 1901.

Rank-mobility appears to be dependent primarily on the investment policy of the government which is often biased in favor of large cities as noted by Wellisz (1971). It appears that the growth of large cities is unlikely to decrease in the near future. This observation seems to agree with the observation made by the World Bank that the largest cities in developing countries will continue to grow even if the national policy favours decentralization.

Policy Implications

Policy implications may be discussed at two levels,
general and specific. At the general level, this study
gives an understanding of the Bangladeshi urban structure
using urban hierarchical theory - the city rank-size rule.
It also gives some directions on how to restructure the
urban system in order to bring about an improved spatial
organization of urban/rural relationships. However, a
comprehensive spatial development of a country requires the
knowledge of the structure and process of socio-economic
dynamics and locational decisions of firms (Wubneh, 1982).

More specifically, the study yields several
implications. The first, has to do with decentralization.
Brutzkus (1975) suggests that the total number of urban
centers should not exceed the necessities to service rural
areas adequately and to ensure spread effects of development
benefits. Brutzkus indicates that a basic rule for the
spacing of larger growth poles is for each to cover a
complementary region from which people are able to commute
at least on a weekly basis. Ideas like this based on
studies of the urban structure would have greatly improved
the government's decentralization plan and prevented a drain
of development resources which the 383 new ill chosen
centers are currently creating. The purpose of creation of
these new urban centers was to ensure a grass-root
development by providing development facilities in all urban
centers. The inappropriate choice of centers has led to

political tension, thereby threatening the stability of the
country. The rank-size shift analysis suggests that some
towns have no potential for growth. For example, Debhata
shows a declining trend over the study period. Its
declining trend caused it to be dropped out from the urban
centers list in 1974 (Table 4.3). But vigorous
decentralization policy of the Bangladeshi government picked
up this city in 1981. It seems unrealistic to revive this
city which simply costs additional resources. Debhata is
situated in the extreme south-west corner of the country
which is less populated. With better knowledge of the urban
structure, potential growth centers could have been
strategically located on rural urban migration paths and
thereby serving the goals of decentralization. Studying
relative performance of existing urban centers would have
also helped to revive some apparently stagnant towns thereby
saving resources.

Secondly, studies of the urban structure could aid in
reshaping the transportation and communication system of the
country. This could be designed to link potential growth
centers and incorporate underdeveloped peripheral regions
into the national and development process. For example, in
the south-eastern part of the country, there is only one
large city, i.e., Chittagong. Being in a mountainous
densely forested region, its transportation system is
underdeveloped. But as it is a center for timber, fruits
and other forest products, it should have been better

connected with other parts of the country to improve
regional trade.

Thirdly, rank-size plot of 1981 indicates a break in
the fourth and fifth ranking cities, i.e., Rajshahi and
Mymensingh which demand a special attention in terms of
localizing development efforts of the Bangladeshi
government. It is specially true for Rajshahi which is the
leading city of the Northern part of Bangladesh. The
regional development of this part solely depends on the
improvement of this city. It is basically a university
town. However, it has rich resources which should be
attractive to industrial development if only the physical
infrastructures were adequate.

Lastly, the control of growth of Dhaka, the primate
city of Bangladesh is also an important consideration. The
study shows that Bangladesh does not have high primacy like
most other less developed countries. Its central function
could be enhanced by more development expenditure to improve
the depressing conditions in the city, while at the same
time steaming migration into it. This could be done by
strengthening urban centers like Comilla, Noakhali, and
Faridpur districts, the main areas from where the Dhaka city
receives most of its migrants.

APPENDIX

Population and Rank of Bangladesh's Urban Centers

APPENDIX

Population and Ranks of Bangladesh's urban centers, 1901-1981.

CITY	1901 P	1901 R	1911 P	1911 R	1921 P	1921 R	1931 P	1931 R	1941 P	1941 R	1951 P	1951 R	1961 P	1961 R	1974 P	1974 R	1981 P	1981 R
Dhaka	128857	1	153609	1	168510	1	196111	1	295735	1	335928	1	556712	1	1679572	1	3440147	1
Chittagong	106848	2	125226	2	125968	2	173577	2	224732	2	289981	2	364205	2	889760	2	1390684	2
Khulna	10426	22	12996	22	16049	17	19120	16	31749	12	41409	7	127970	4	437304	3	652000	3
Rajshahi	21589	4	23406	4	24598	8	27064	7	40778	7	39662	8	56885	7	132909	6	253726	4
Mymensingh	14668	15	19853	15	25287	7	30480	6	52950	4	44527	6	53256	9	182153	5	190911	5
Comilla	19169	6	22692	6	25914	4	31365	5	48462	5	47195	5	54504	8	86446	9	184132	6
Barisal	18978	7	22473	7	26744	3	35716	3	61316	3	89278	3	69936	5	98127	7	172905	7
Sylhet	13893	17	14457	17	16912	16	21435	12	28128	15	32773	12	37740	16	59546	18	168371	8
Rangpur	15960	14	16429	14	19076	13	20749	13	34039	10	30501	16	40634	14	72829	12	153174	9
Jessore	8054	28	8911	28	10139	27	11356	26	18410	25	23867	20	46366	11	76168	10	148927	10
Saidpur	5848	32	8287	32	13479	22	16519	18	19516	23	61018	4	60628	6	90132	8	126608	11
Pabna	18424	8	19274	8	19343	12	21904	11	32299	11	31924	14	40792	13	62254	15	109065	12
Serajganj	23114	3	24777	3	25518	5	32467	4	41309	6	37545	10	47152	10	74457	11	106774	13
Dinajpur	13430	18	15945	18	18025	14	19156	15	28190	14	34271	11	37711	17	61866	16	96718	14
Jamalpur	17965	9	21109	9	23113	10	23077	10	29139	13	26952	17	37988	15	60261	17	91815	15
Nawabganj	17016	11	23322	11	12633	23	15826	20	23163	19	23311	21	29725	21	46059	23	87724	16
Brahmanbaria	19915	5	22295	5	23414	9	26662	9	35887	9	37865	9	44784	12	62407	14	87570	17
Chandpur	9362	24	12717	24	16838	17	40434	8	31620	15	15118	18	34837	18	51668	20	85656	18
Tangail	16666	12	16362	12	14305	20	16082	19	21684	20	21513	22	23688	28	51863	19	77518	19
Chuadanga	5330	35	6095	35	7849	30	9405	31	13842	29	8336	43	11625	45	36381	28	76000	20
Kushtia	-	-	-	-	-	-	-	-	-	-	21129	23	24952	25	36199	29	74892	21
Narsingdi	-	-	-	-	-	-	-	-	-	-	-	-	14752	38	39140	26	74364	22
Ishurdi	-	-	-	-	-	-	-	-	-	-	-	-	11566	46	19826	57	72123	23
Companiganj	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71581	24
Chowmohoni	-	-	-	-	-	-	-	-	-	-	-	-	4545	71	21460	51	69623	25
Bogra	7094	29	9113	29	12322	24	14819	23	21681	21	24996	19	33784	19	47154	21	68749	26
Faridpur	11649	20	13131	20	14503	19	15516	21	25671	17	25287	18	28333	22	46232	22	66579	27
Bhairab	-	-	-	-	-	-	4000	54	7695	44	11822	33	31749	20	43702	24	63563	28
Palash	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	63462	29
Madaripur	17463	10	19073	10	25297	6	26894	8	26624	16	21005	24	25328	24	32488	36	63388	30
Noakhali	6520	30	7009	30	7715	31	13063	24	18575	24	16657	27	19874	32	32490	35	59065	31

(APPENDIX - Continued)

CITY	1901 P	R	1911 P	R	1921 P	R	1931 P	R	1941 P	R	1951 P	R	1961 P	R	1974 P	R	1981 P	R
Rupganj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	56305	32
Naogaon	16246	13	18026	13	19518	11	3104	56	10066	37	11248	35	20276	30	34395	32	52975	33
Kishoreganj	8356	27	10866	24	10299	26	15437	22	20128	22	19034	26	24031	27	35605	30	52302	34
Saikhira	.	.	.	.	.	.	11241	27	14769	26	14727	28	20169	31	40507	25	52156	35
Banyachang	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50164	36
Sherpur (Mym.)	12535	19	15591	17	17813	15	19547	14	24210	18	19262	25	24924	26	35578	31	48214	37
Patuakhali	5003	38	6217	34	6984	34	6434	39	10847	34	10279	38	12325	40	27167	41	48121	38
Jhenaidah	.	.	.	.	.	.	.	.	.	.	4558	58	9055	51	34020	34	47953	39
Kurigram	1777	47	3419	45	4643	42	6339	50	8452	34	8003	45	8703	54	30129	37	47641	40
Alamdanga	.	.	.	.	.	.	.	.	.	.	.	.	5494	67	9942	93	47003	41
Raipur	.	.	.	.	.	.	.	.	.	.	.	.	4421	72	9578	95	40908	42
Chandraghona	1635	48	3420	44	6496	36	8479	33	13128	31	13770	30	17738	33	27401	40	40372	43
Gaibandha	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	39561	44
Sandwip	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	39459	45
Ramgati	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	38904	46
Rajbari	.	.	.	.	7275	33	7104	37	9048	39	11338	34	16044	36	24020	47	38645	47
Laksham	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	37813	48
Bagerhat	.	.	.	.	.	.	9050	32	12696	32	7368	45	16398	35	27912	38	37471	49
Netrokona	11402	21	13740	19	8687	28	10980	28	14180	28	12691	32	17008	34	26460	43	37455	50
Manikganj	.	.	.	.	.	.	.	.	.	.	.	.	11676	45	26649	42	37132	51
Joupurhat	.	.	.	.	.	.	.	.	.	.	.	.	.	.	15687	65	37122	52
Munshiganj	.	.	.	.	.	.	4500	50	7186	47	7071	48	8604	56	27546	39	37060	53
Lalmonir Hat	.	.	.	.	.	.	4691	49	10796	35	9073	41	22001	29	23047	49	36439	54
Rangamati	.	.	.	.	.	.	.	.	.	.	.	.	6416	66	20473	55	36405	55
Satkania	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	36271	56
Patiya	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	33521	57
Thakurgaon	.	.	.	.	.	.	5558	44	7501	45	9849	40	7039	62	15519	66	33404	58
Bhola	.	.	.	.	4525	44	.	.	.	.	6193	50	8406	58	12774	79	32838	59
Swarupkati	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	32676	60
Jhalokati	5234	37	5979	36	5955	37	6496	38	9184	38	9950	39	10709	47	21272	52	32539	61
Gopalpur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	39066	27	31725	62
Natore	8654	26	8251	29	8040	29	8318	35	10632	36	10348	37	13317	39	21053	53	31210	63
Narail	.	.	.	.	.	.	.	.	.	.	.	.	.	.	21023	54	31032	64
Nageswari	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	30531	65
Rupsa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	30440	66

82

(APPENDIX - Continued)

CITY	1901 P	1901 R	1911 P	1911 R	1921 P	1921 R	1931 P	1931 R	1941 P	1941 R	1951 P	1951 R	1961 P	1961 R	1974 P	1974 R	1981 P	1981 R
Cox's Bazar	3885	42	4378	40	4632	43	5018	47	5945	52	5873	54	8427	57	15720	64	29614	67
Nilphamary	2396	45	2612	46	3741	47	4405	51	8201	40	5277	56	9757	50	18955	58	29558	68
Laksam	.	.	.	.	.	.	.	.	.	.	.	.	.	.	24063	45	29075	69
Chilmari	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	28369	70
Feni	.	.	.	.	.	.	.	.	10875	30	5421	55	4929	57	9817	49	28249	71
Tungipara	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	28183	72
Magura	.	.	.	.	.	.	.	.	.	.	.	.	6999	64	20240	56	28007	73
Kalia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	27832	74
Pirojpur	14119	16	11996	23	13841	21	10959	29	13771	30	14517	29	15754	37	22218	50	27531	75
Monglaport	.	.	.	.	.	.	.	.	.	.	.	.	3847	76	14590	72	27266	76
Gournadi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	26658	77
Fatikchhari	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	26147	78
Char Fasson	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25335	79
Burhanuddin	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25306	80
Lohagara	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25274	81
Srimongal	.	.	.	.	.	.	.	.	2523	58	3006	61	4040	75	8135	99	25151	82
Rangunia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	24647	83
Bhanga	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	24261	84
Mehendiganj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23918	85
Hobiganj	5236	36	6244	33	5918	38	7577	36	11856	33	10784	36	12097	41	16281	62	23677	86
Sarail	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23653	87
Meherpur	5766	33	5961	37	5398	40	6205	41	7728	43	7156	46	8147	60	15936	63	23573	88
Bheramara	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8494	97	23519	89
Lahmohan	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23456	90
Adamdighi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23240	91
Ramu	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23126	92
Bandar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23066	93
Raipur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	22390	94
Fulbari	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	22023	95
Phulbala	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	21855	96
Haimchar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	21266	97
Srinagar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	21003	98
Rawzan	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20910	99
Khagrachhari	.	.	.	.	.	.	.	.	.	.	.	.	.	.	12119	83	20855	100
Hajiganj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20843	101

(APPENDIX - Continued)

CITY	1901 P	1901 R	1911 P	1911 R	1921 P	1921 R	1931 P	1931 R	1941 P	1941 R	1951 P	1951 R	1961 P	1961 R	1974 P	1974 R	1981 P	1981 R	R
Kotchandpur	9065	25	8076	30	7545	32	6115	.	6418	43	6004	49	8737	51	15411	53	20594	68	102
Gafargaon	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3513	105	20363	.	103
Mirzapur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17918	60	19905	.	104
Abhaynagar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	19746	.	105
Boal Khali	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	19712	.	106
Jhikargacha	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	19405	.	107
Domar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	19253	.	108
Parbatipur	.	.	.	.	.	.	5141	.	6521	46	32410	48	27188	13	10604	23	18979	87	109
Fulbari	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18965	.	110
Sunamganj	3530	43	4620	39	4881	41	5326	45	7484	45	8482	46	9843	42	14516	48	18782	73	111
Senbag	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18701	.	112
Ramgarh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18641	.	113
Rampur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18428	.	114
Bhedarganj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18423	.	115
Sarankhola	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18371	.	116
Gopalganj	.	.	.	.	.	.	.	.	.	.	.	.	8856	52	13861	52	18238	75	117
Morelganj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17992	.	118
Kaliganj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	15218	.	17934	71	119
Fakirhat	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17624	.	120
Bajitpur	10027	23	10833	25	11568	25	11650	25	14394	27	13105	31	12097	42	14272	42	17620	74	121
Bhandaria	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17264	.	122
Badarganj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17258	.	123
Sarishabari	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	16881	.	124
Iswarganj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	16820	.	125
Barguna	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10245	.	16650	74	126
Teknaf	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	16552	.	127
Bera	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	16509	.	128
Moulvibazar	2481	44	2369	47	3334	49	4314	49	5855	52	5945	53	6522	52	11032	65	16509	74	129
Ulipur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	16359	.	130
Maithbari	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	16304	.	131
Muktagacha	5888	31	6555	32	6770	35	6131	35	7877	42	6979	41	8658	49	11908	55	16292	74	132
Gurudaspur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	16289	.	133
Kamalganj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	16230	.	134
Nabinagar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	16085	.	135
Keshabpur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	15993	.	136

(APPENDIX - Continued)

CITY	1901 P	1901 R	1911 P	1911 R	1921 P	1921 R	1931 P	1931 R	1941 P	1941 R	1951 P	1951 R	1961 P	1961 R	1974 P	1974 R	1981 P	1981 R
Mirzaganj																	15630	137
Kalapara																	15421	138
Bakshiganj																	15273	139
Kumbdia																	15086	140
Ima																	15032	141
Chhatak													577	78	13248	78	15004	142
Bhangura																	14936	143
Dhamrai																	14854	144
Nalitabari																	14794	145
Bhurungamari																	14551	146
Ramganj																	14518	147
Muradnagar																	14390	148
Gouripur							6319	40	7781	42	5892	53	7028	63	10020	74	14370	149
Dakshin Chan																	13991	150
Rajair																	13979	151
Kumarkhali	4584		3769	39	3763	43	3362	46	5582	55	3885(51)	60	5353	68	10544	88	13828	152
Zakiganj																	13754	153
Hatibandha																	13740	154
Jamalganj																	13393	155
Galachipa																	13157	156
Panchagarh															13643	76	13147	157
Hatiya																	12997	158
Muladi																	12974	159
Bochaganj																	12788	160
Banshkhali																	12646	161
Dacope																	12631	162
Karimganj																	12589	163
Astagram																	12427	164
Derai																	12351	165
Namdial																	12197	166
Ajmiriganj																	12175	167
Kuliarchar																	12166	168
Mohonganj																	12148	169
Dashmina																	12137	170
Bakerganj																	12123	171

(APPENDIX - Continued)

CITY	1901 P	1901 R	1911 P	1911 R	1921 P	1921 R	1931 P	1931 R	1941 P	1941 R	1951 P	1951 R	1961 P	1961 R	1974 P	1974 R	1981 P	1981 R
Harinakundu																	11985	172
Hossainpur																	11983	173
Pallong																	11876	174
Beanibazar																	11640	175
Ukhia																	11640	176
Kaliganj																	11571	177
Tazmuddin																	11493	178
Sherpur (Bog.)	4104	41	4088	42	3984	45	4279	53	5145	56	4249	59	4812	70	7233	74	11161	179
(Harirampur)																	11090	180
Dumuria																	11077	181
Sailkupa																	11048	182
Moheshkhali																	11010	183
Chhagalnaiya																	10896	184
Singair																	10708	185
Nikli																	10699	186
Palashbari																	10691	187
Belkuchi																	10680	188
Dhunat																	10660	189
Pirganj																	10530	190
Bhaluka																	10523	191
Goalandaghat																	10511	192
Kaliganj																	10398	193
Ullapara																	10382	194
Sripur																	10271	195
Kaliganj																	10186	196
Sakhipur																	10179	197
Bandarban																13381	77	10092	198
Pangsha																	10055	199
Manirampur																	9884	200
Mirsharai																	9789	201
Durgapur																	9641	202
Panchbari																	9609	203
Birampur																	9595	204
Terokhada																	9554	205
Phulpur																	9506	206

(APPENDIX - Continued)

CITY	1901		1911		1921		1931		1941		1951		1961		1974		1981	
	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P	R
Singra																	9494	207
Char Bhadrash.																	9484	208
Fulchbari																	9421	209
Bauphal																	9411	210
Rajapur																	9327	211
Kachua																	9314	212
Lama																	9241	213
Panch Bibi																	9142	214
Biswanath																	9126	215
Bassal																	9033	216
Gobindaganj																	9031	217
Langadu																	9002	218
Amtali																	8909	219
Baghaichhari																	8810	220
Manikchhari																	8807	221
Chadma																	8753	222
Matlab																	8736	223
Chaikhil																	8667	224
(Gangni																	8632	225
Betagi																	8584	226
Kulaura															9160	96	8544	227
Chandamaish																	8522	228
Mollahat																	8444	229
Pirganj																	8437	230
Nawabganj																	8431	231
Maheshpur	4180	40	4211	41	3611	48	321	58	3785	57	2983	62	4153	73	7132	101	8428	232
Boalmari																	8302	233
Melandah																	8183	234
Kalihati																	8133	235
Nagarpur																	8090	236
Kaunia																	8061	237
Kalaroa																	7991	238
Nasimagar																	7950	239
Taraganj																	7948	240
Hizla																	7917	241

(APPENDIX - Continued)

CITY	1901 P	R	1911 P	R	1921 P	R	1931 P	R	1941 P	R	1951 P	R	1961 P	R	1974 P	R	1981 P	R
Char Rajibpur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7840	242
Mitamain	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7832	243
Fenchuganj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7779	244
Chowhali	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7764	245
Fulbari	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7674	246
Atrai	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7582	247
Mitha Pukur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7579	248
Sundarganj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7551	249
Sroberdi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7443	250
Modhupur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7353	251
Madan	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7350	252
Kachua	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7346	253
Khetlal	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7329	254
Akhaura	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7267	255
Daudkandi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7229	256
Gomastapur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7185	257
Charghat	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7163	258
Sadullapur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7064	259
Daulatkhan	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7032	260
Biral	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6996	261
Darmudya	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6987	262
Monohardi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6970	263
Sujanagar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6888	264
Gangachara	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6833	265
Patgram	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6799	266
Haluaghat	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6793	267
Agailjhara	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6776	268
Nagarkanda	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6750	269
Kazipur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6743	270
Trisal	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6724	271
Debidwar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6700	272
Gossairhat	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6694	273
Dohar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6681	274
Shibchar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6674	275
Rowmari	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6661	276

87

(APPENDIX - Continued)

CITY	1901 P	1901 R	1911 P	1911 R	1921 P	1921 R	1931 P	1931 R	1941 P	1941 R	1951 P	1951 R	1961 P	1961 R	1974 P	1974 R	1981 P	1981 R	R
Dewanganj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6657	.	277
Sonaraia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6633	.	278
Golabganj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6593	.	279
Rajanagar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6587	.	280
Narla	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6579	.	281
Pakundia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6563	.	282
Kathalia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6509	.	283
Bagha	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6445	.	284
Naikong Chari	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6340	.	285
Dighinala	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6326	.	286
Parshuram	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6277	.	287
Dimla	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6273	.	288
Koyra	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6263	.	289
Ghoraghat	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6256	.	290
Zanzira	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6203	.	291
Faridpur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6188	.	292
Bagherpara	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6187	.	293
Kamarkandi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6159	.	294
Shahrasti	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6055	.	295
Birganj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6045	.	296
Asasuni	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6029	.	297
Purba Dhala	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6014	.	298
Chauddagram	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5989	.	299
Banchharampur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5971	.	300
Burichang	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5909	.	301
Kotwalipara	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5893	.	302
Debiganj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5865	.	303
Mirpur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5845	.	304
Banura	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5844	.	305
Porsha	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5836	.	306
Shibganj	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5817	.	307
Banaripara	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5769	.	308
Chatmohar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5682	.	309
Damurhuda	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5633	.	310
Puraten Pan	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5619	.	311

(APPENDIX - Continued)

CITY	1901		1911		1921		1931		1941		1951		1961		1974		1981	
	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P	R
Dhudchanchia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5606	312
Baonarpara	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5553	313
Tahirpur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5545	314
Tarail	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5536	315
Tanore	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5533	316
Pamiola	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5429	317
Kowkhali	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5277	318
Bamna	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5233	319
Jibornagar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5228	320
Belaba	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5211	321
Savar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	24023	46	5209	322
Rajarhat	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5195	323
Shyamnagar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5147	324
Shibpur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5108	325
Islampur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5084	326
Delduar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5068	327
Laipur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5061	328
Wazirpur	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5007	329

Note: P population; R Rank
Source of population data:
1901-1961: Census of Pakistan, 1961, Table 4, pp. II-94 to II-97.
1974: Bangladesh Population Census, 1971, Table 4, pp. 98-111.
1981: Bangladesh Population Census 1981, Report on Urban Area, pp. 51-126.

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