Population Growth and Policies in Mega-Cities

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NOTE

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Papers have been edited and consolidated in accordance with United Nations practice and requirements.

ST/ESA/SER.R/69

PREFACE

This publication is one in a series of studies being prepared by the Population Division of the Department of International Economic and Social Affairs of the United Nations Secretariat which focus on the population policies and plans of some mega-cities in developing countries, cities that are expected to have populations of at least 8 million inhabitants by the year 2000.

The object of the series is to examine the formulation, implementation and evaluation of the population policies of mega-cities from a broad perspective, emphasizing the reciprocal links between population and development in the spirit of the World Population Plan of Action. 1/ The development of population policies to improve the standard of living and the quality of life of the inhabitants of the world's largest cities is a highly complex and multifaceted activity. It involves, for example, not only the analysis of migration trends, the preparation of population projections, and the formulation of population distribution strategies but also the provision of cost-effective urban infrastructure (e.g., housing, water, sewerage, transportation, and health and educational facilities), the monitoring and creation of employment, the assembly of urban land for development projects, the improvement of municipal revenue-raising mechanisms and the establishment of effective institutional arrangements for planning and managing urban growth.

Each of the technical papers in this series follows a common format consisting of five major sections. Section I provides basic information on demographic trends and reviews the use of demographic data in planning for rapidly growing urban populations. Section II presents background information on the city's economic base, the spatial structure

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1/ See Report of the United Nations World Population Conference, 1974, Bucharest, 19-30 August 1974 (United Nations publication, Sales No. E.75.XIII.3), chap. 1, and Report of the International Conference on Population, 1984, Mexico City, 6-14 August 1984 (United Nations publication, Sales No. E.84.XIII.8 and Corr. 1 and 3), chap. I, sect. B.

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of the metropolitan region and the sectoral and spatial distribution of jobs, all of which are crucial to a proper understanding of how population distribution strategies operate. Section III reviews early decentralization strategies and how they were evaluated and revised by local planners and then examines current population distribution strategies for the metropolitan region. Section IV deals with a number of key issues and sectors - the labour market, urban land, housing, water supply and so on - from the perspective of planning for rapidly growing urban populations and managing urban growth. Wherever possible, attention is given in that section to the extent to which various sectoral policies may have served as implicit spatial policies that reinforced or perhaps counteracted explicit spatial goals. Finally, section V examines the sectoral distribution of public investment and how that investment has influenced the achievement of spatial goals, how individual cities have generated revenue for municipal projects, and what types of institutional arrangements have been established to plan for and manage urban growth.

To date, reports issued in the <u>Population Growth and Policies in Mega-Cities</u> series are:

CALCUTTA	(ST/ESA/SER.R/61)
SEOUL	(ST/ESA/SER.R/64)
METRO MANILA	(ST/ESA/SER.R/65)
BOMBAY	(ST/ESA/SER.R/67)
DELHI	(ST/ESA/SER.R/68)

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Symbols of United Nations documents are composed of capital letters combined with figures. Mention of such a symbol indicates a reference to a United Nations document.

Reference to "dollars" ($) indicates United States dollars, unless otherwise stated.

The term "billion" signifies a thousand million.

Annual rates of growth or change refer to annual compound rates, unless otherwise stated.

A hyphen between years (e.g., 1984-1985) indicates the full period involved, including the beginning and end years; a slash (e.g., 1984/1985) indicates a financial year, school year or crop year.

A point (.) is used to indicate decimals.

The following symbols have been used in the tables:

Two dots (..) indicate that data are not available or are not separately reported.

A dash (--) indicates that the amount is nil or negligible.

A hyphen (-) indicates that the item is not applicable.

A minus sign (-) before a number indicates a deficit or decrease, except as indicated.

Details and percentages in tables do not necessarily add to totals because of rounding.

The following abbreviations have been used:

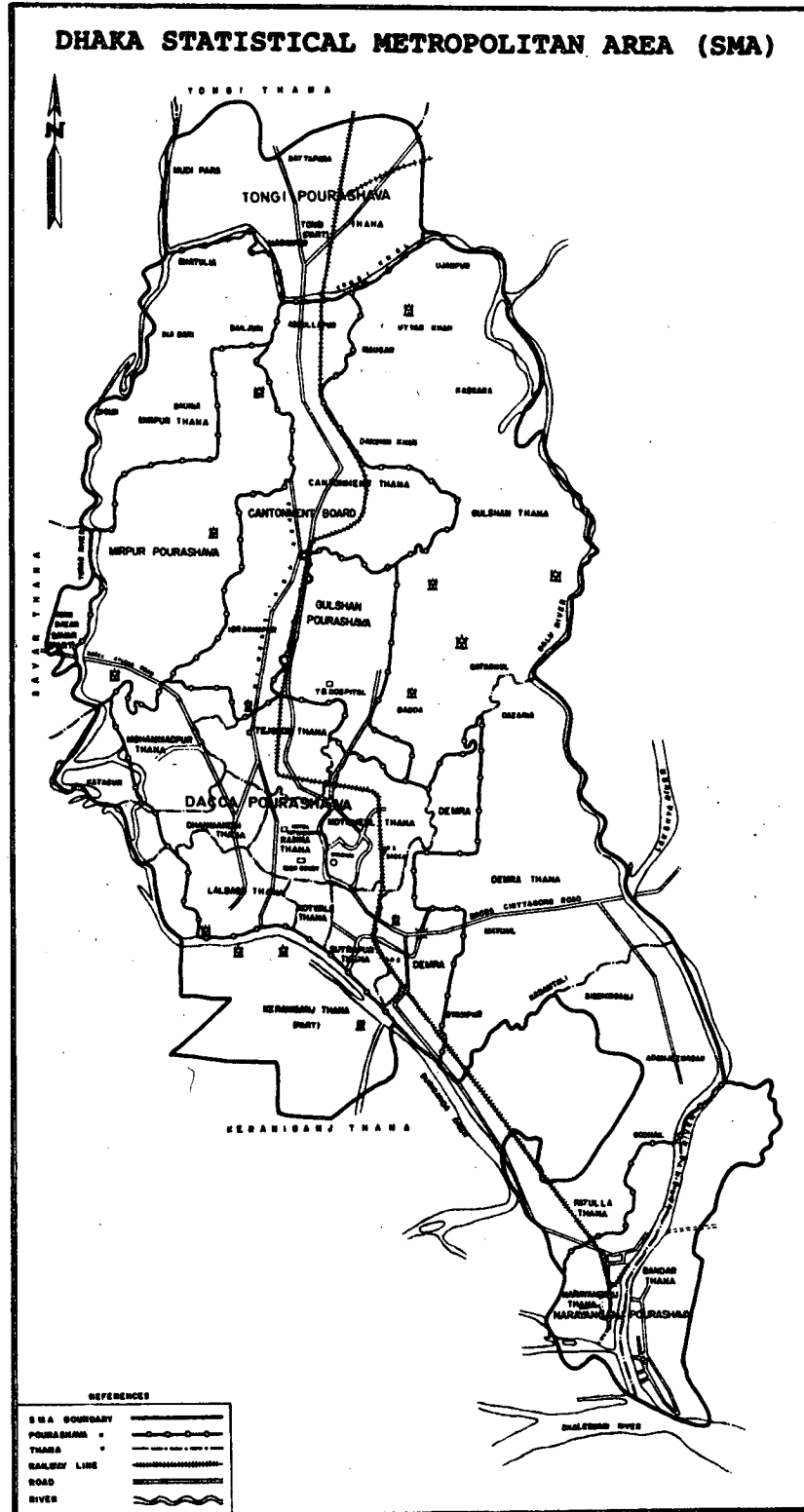|		
ADB	-	Asian Development Bank
CBD	-	Central Business District
DMA	-	Dhaka Metropolitan Area
DMAIUDP	-	Dhaka Metropolitan Area Integrated Urban Development Project
DMC	-	Dhaka Municipal Corporation
DSMA	-	Dhaka Statistical Metropolitan Area
UNDP	-	United Nations Development Programme
UDD	-	Urban Development Directorate
UNCHS	-	United Nations Centre for Human Settlements
WASA	-	Water and Sewerage Authority

INTRODUCTION

Dhaka, the capital city of Bangladesh since it achieved independence in 1971, has experienced rapid population growth as a result of high rates of natural increase and massive in-migration from all regions of the country. As of 1981, the Dhaka (Statistical) Metropolitan Area had a population of 3,459,000, whereas the larger Dhaka District had a population of more than 10 million inhabitants (see figs. I and II). 1/ According to the United Nations 1984 assessment, Dhaka was the 31st largest city in the world in 1985 and is expected to be the 15th largest by the year 2000 (United Nations, 1987).

Dhaka has many serious problems. Partly because of extensive seasonal flooding and partly because of speculation in the urban land market (largely fuelled by expatriate remittances), Dhaka has a shortage of land for housing and other urban development projects. Housing finance is poorly developed, and a majority of households are unable to afford even minimal shelter. Health and environmental conditions are extremely poor in the urban slums, a large proportion of the population is illiterate, and approximately 65 per cent of the labour force is employed in the informal sector.

Dhaka is one of the world's poorest large cities, with per capita GDP of 1,993 taka (1980-1981) (equivalent to about $ 100 in 1981 prices) (Bangladesh Bureau of Statistics, 1983b). It is also among the world's least developed cities. It has one of the highest levels of illiteracy and one of the lowest levels of commercial energy consumption, motorized vehicles, and telephones per capita, and is low on most other indicators of development. 2/ On the political/administrative front, Dhaka is also exceptional, for the Government of Bangladesh has embarked on a massive, radical administrative decentralization programme (the upazila programme). 3/

What is perhaps most exceptional, however, is Dhaka's potential for demographic growth. Bangladesh is one of the world's largest and most densely populated countries, with rural areas that will be incapable of absorbing the expected large population increments. Even assuming a significant decline in fertility as a result of stepped-up family planning and population education programmes, the creation of more off-farm employment in rural areas, and the retention of some proportion of potential rural urban migrants as a result of the impact of the upazila programme, a conservative estimate is that the country's urban areas will have to absorb about 21.1 million new inhabitants by the end of the century (Richardson, 1984). The Dhaka (Statistical) Metropolitan Area will probably reach more than 9 million inhabitants by the end of the century, which implies that it will have to absorb as many as 6 million new inhabitants. Given the current stagnation of the industrial sector, the low proportion of formal-sector employment, the inadequate network of basic services, and the extremely low level of income and resources, that will be a formidable task.

Figure I

DHAKA STATISTICAL METROPOLITAN AREA (SMA)

3403.1x

Figure II

DHAKA DISTRICT
SHOWING ADMINISTRATIVE AREA

3403.2x
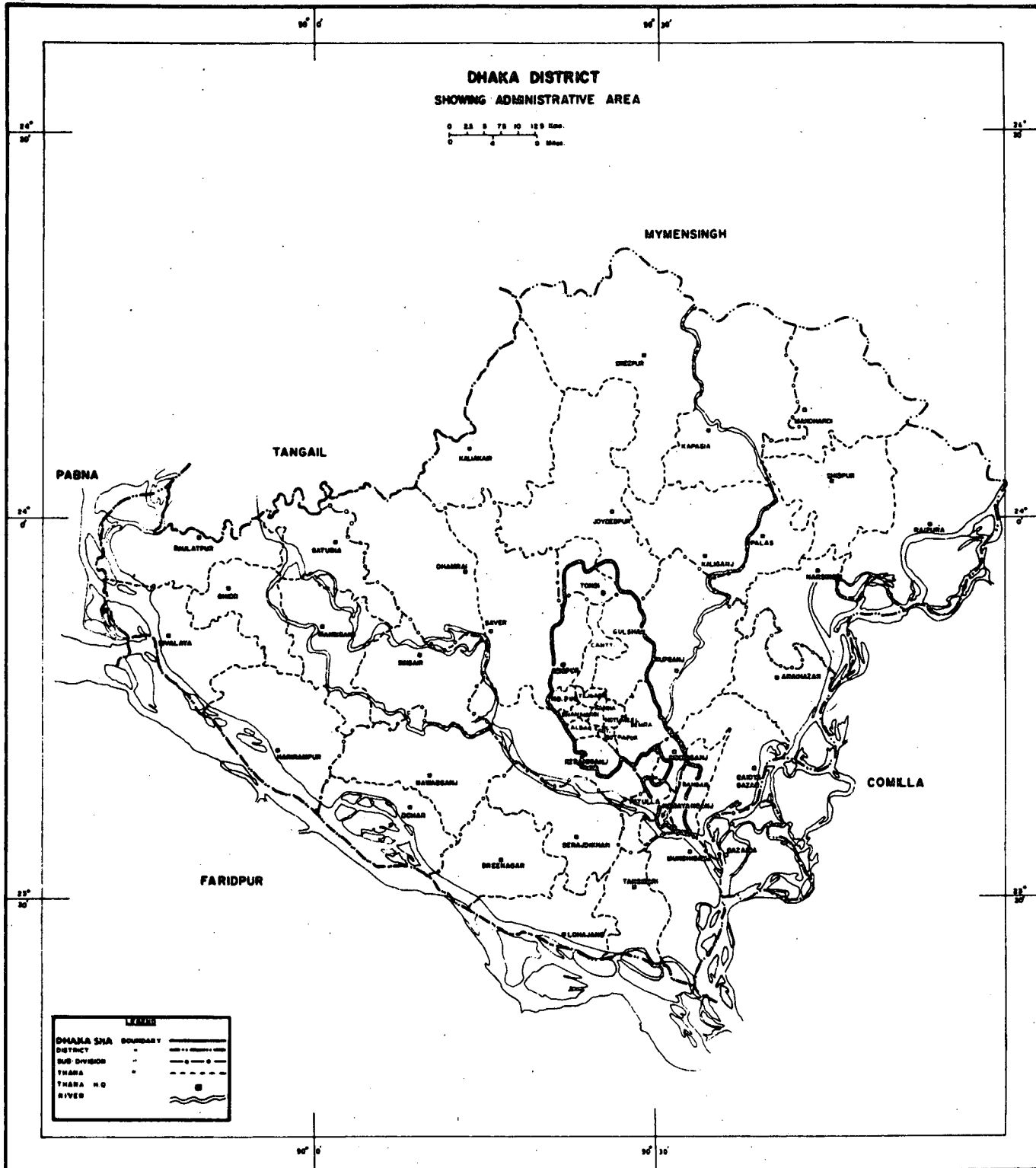
I. DEMOGRAPHIC CHARACTERISTICS

A. Population growth

The population of Dhaka City was about 129,000 inhabitants in 1901, whereas the population of the larger Dhaka District was 2,617,000. The city grew at a moderate rate, 1.4 per cent per annum, during 1901-1931, reaching close to 200,000 inhabitants in 1931. During the same period, Dhaka District grew by less than 1 per cent per annum, reaching 3,449,000 inhabitants. According to census data, the recorded rate of population growth in both the city and the district was quite erratic over the next three decades. In Dhaka City, the rate of population growth was fairly rapid - 4.2 per cent per annum - during 1931-1941, slowed to 1.3 per cent per annum during 1941-1951, and subsequently increased to 5.2 per cent per annum during 1951-1961, with the total population reaching 557,000 in 1961 (table 1). Dhaka District, which reached 5,096,000 in 1961, also exhibited a fluctuating pattern of population growth. For example, its growth rate declined from 2 per cent per annum during 1931-1941 to -0.3 per cent during 1941-1951, and then rose again to 2.3 per cent during 1951-1961. However, it is now suspected that the population recorded in the 1941 census was overstated by both Hindus and Muslims, who had a vested interest in exaggerating their numbers. The actual increase during 1931-1941 was probably less than indicated, and the differences between decadal growth rates less than shown (Government of Bangladesh, ADB and UNDP, 1981).

During the 1961-1974 intercensal period, in which Bangladesh experienced several natural disasters (e.g., a cyclone and tidal wave in 1970), the war of independence (1971) and a major famine (1974), the Dhaka Metropolitan Area grew by more than 10 per cent per annum, reaching slightly more than 2,000,000 inhabitants in 1974 4/, whereas the District grew by 3.8 per cent per annum, reaching 8,293,000. During 1974-1981, the Dhaka (Statistical) Metropolitan Area continued to grow rapidly, by about 8 per cent per annum, reaching 3,459,000. Dhaka District as a whole grew by 2.8 per cent per annum, reaching a total population of more than 10 million inhabitants in 1981.

Considerable uncertainty exists about the parameters of demographic change in Bangladesh, particularly at the subnational level. Birth and death rates have generally been obtained from sample surveys or extrapolated from trends at the national level. On the basis of data from the Bangladesh Fertility Survey, Dhaka's total fertility rate was estimated to be 7.2 in 1975 (Government of Bangladesh, ADB and UNDP, 1981). There are no data available on mortality levels in the Dhaka area. According to the the Base Line Demographic Survey (conducted by the Bangladesh Bureau of Statistics in 1980), average life expectancy for both sexes was 61.9 in urban areas and 56.9 in the country as a

Table 1. Population and average annual rate of growth
in Dhaka a/ and Dhaka District, 1901-1981

| Year | Dhaka | | Dhaka District | |
	Population (thousands)	Average annual rate of growth	Population (thousands)	Average annual rate of growth
1901	129	-	2 617	-
1911	154	1.8	2 929	1.1
1921	169	0.9	3 172	0.8
1931	196	1.5	3 449	0.8
1941	296	4.2	4 224	2.0
1951	336	1.3	4 075	-0.3
1961	557	5.2	5 096	2.3
1974	2 004 b/	10.4	8 293	3.8
1981	3 454 c/	8.1	10 049	2.8

a/ The population figures for 1901-1961 refer to Dhaka City. The 1974 figure refers to the Dhaka Metropolitan Area.
b/ This figure is adjusted. The recorded figure was 1,680.
c/ This figure refers to the Dhaka (Statistical) Metropolitan Area, which was designated in 1981 and which is now the standard census classification area. The population of the Dhaka Metropolitan Area was 2,807,000 in 1981.

Sources: Government of Bangladesh, Asian Development Bank and United Nations Development Programme, Dacca Metropolitan Area Integrated Urban Development Project (1981); Bangladesh Bureau of Statistics, Dhaka: District Statistics (1983).

whole (Bangladesh Bureau of Statistics, 1984). According to the vital registration system, average life expectancy was 60.6 in urban areas and 54.5 in the country as a whole (Bangladesh Bureau of Statistics, 1984). The Dhaka Metropolitan Study concluded, however, that the conditions under which a majority of the urban poor lived in Dhaka were, if anything, more unhealthy than those of the rural population. The study therefore estimated that Dhaka had only slightly lower mortality rates than the population as a whole (Government of Bangladesh, ADB and UNDP, 1981).

With respect to other demographic characteristics, the population of the urban areas of Dhaka District was comparatively older, with fewer children and larger numbers of adults - although with a smaller proportion of persons in the oldest age groups - and had proportionately more males than the country as a whole. For example, according to data corrected for age misreporting, 39.0 per cent of the urban population of Dhaka District was under 15 years of age as of 1981, compared to 46.3 per cent in the country as a whole. Mainly because of the influx of large numbers of young adult migrants, 51.8 per cent of the urban population of Dhaka District was between ages 15-44, 7.6 per cent between ages 45-64 and 1.8 per cent over 65 years of age. The corresponding figures for Bangladesh were: 40.9 (15-44); 9.8 (45-64); and 5.0 (65+). The movement of unaccompanied men in search of work also generated an unbalanced sex ratio - 137 men per 100 women in the urban areas of Dhaka disrict, compared to 108 in the country as a whole (Government of Bangladesh, ADB and UNDP, 1981). Average household size, however, was fairly similar: 5.9 in the urban areas of Dhaka district, compared to 5.8 in the country as a whole.

B. Migration

For decades prior to the partition of British-ruled India in 1947, rural/urban migration bypassed the towns of Eastern Bengal for the metropolis of Calcutta. When the route to Calcutta was closed after partition, Dhaka became the major recipient of the migration. In recent years, the growth of Dhaka City has been predominantly the result of net migration, which accounted for 62.8 per cent of population growth between 1961 and 1974 and 70.5 per cent between 1974 and 1981 (UNDP, UNHCS, and UDD, 1984). Although the relative importance of migration to population growth is expected to decline in the future, about 60 per cent of Dhaka's population growth between 1981 and the year 2000 is anticipated to be the result of net migration (Richardson, 1984).

Research conducted by Bangladeshi sociologists and demographers has identified a number of push factors in rural areas, including over-population, floods and natural disasters, erosion, growing

landlessness, and exploitation by the rural elite and money lenders, as being important in attracting migrants to Dhaka and other urban areas (Huda Chaudhury, 1980). The major pull factors are believed to include employment opportunities in the informal sector and relief activities undertaken by governmental and non-governmental organizations in urban areas (Huda Chaudhury, 1980). In addition, the ration system, in which foodstuffs are sold at subsidized prices, has served as an important pull factor. Whereas all residents of Dhaka and five other urban areas in Bangladesh were formerly entitled to receive ration cards, since 1974 only Government employees have been eligible. However, as of 1979, 63 per cent of the residents of Dhaka were still covered by statutory rations (UNDP, UNHCS and UDD, 1984).

With respect to the origins of migrants in the Dhaka area, a number of surveys conducted by the Centre for Urban Studies of resettlement camps in Demra and Mirpur and of low-income areas in Dhaka City have been remarkably consistent in their findings. The Bakerganj (Barisal), Faridpur and Comilla districts were found to be the districts of origin of 72 per cent of household heads in the Demra resettlement camp, of 69 per cent of household heads in Mirpur, and of 71 per cent in the low-income areas of Dhaka (Government of Bangladesh, ADB and UNDP, 1981). In terms of other characteristics, migrants have been found to be mainly young adults (with the largest proportion in ages 20-30), to be predominantly single males, to be better educated than non-migrants, and to come from large families in both the poorest and most affluent rural communities in Bangladesh (Huda Chaudhury, 1980).

C. Population projections

Population projections which were prepared over the years for Dhaka and its hinterland have varied widely, mainly because of uncertainties regarding the future impact of rural development programmes on migration patterns. Moreover, it is acknowledged that recent experience is probably not a good indicator of future trends, because recent population movements in and around Dhaka have been strongly influenced by external political events and natural disasters.

In the earliest population projections, which were prepared for the 1959 Master Plan, population growth was projected to be only 1.75 per cent per annum over the plan period. However, the rate of population growth actually recorded during the 1961-1974 intercensal period was 6 per cent per annum. Projections prepared for the World Bank assumed that Dhaka's population size in the year 2000 would range from nearly 13 million in the high variant, to 9.3 million in the medium variant, and to slightly over 7 million in the low variant. In the high variant projection, the population growth rate was assumed to remain constant at

around 7 per cent per annum between 1980 and the year 2000. In the medium variant, growth was assumed to decline from 5.8 per cent per annum in 1980-1985 to 4.7 per cent per annum in 1990-2000. In the low variant, growth was assumed to approximately halve - from an average annual rate of 5 per cent in 1980-1985 to 2.6 per cent in the 1990-2000.

In preparing population projections as an input to the Dhaka Metropolitan Area Integrated Urban Development Project (Government of Bangladesh, ADB and UNDP, 1981), the procedure was to start from assumptions about population growth at the national level and then determine how they would have to be modified in order to apply to the Dhaka area. A single mortality assumption and three fertility assumptions were made, from which two were eventually chosen. Age/sex structures for the migrant populations arriving in each five-year period were established, and the natural increase of each migrant stream was projected separately. Information on the pattern of past migration in Bangladesh was also examined, and the main sending areas were identified. A simple model was then established, which related the main migration flows and the way they were distributed to the populations of the areas of origin. Proceeding five years at a time, the size of each migrant stream was determined, scaled and summed to the original projections of the migrants' natural increase in order to obtain the total effect of migration. Total population was obtained by combining natural increase and migration.

Under that methodology, the population of the study area 5/ was projected to increase 109-178 per cent between 1980 and the end of the century, reaching 6,940,000-9,500,000 inhabitants, respectively. In the low variant projection, Dhaka's rate of population growth was estimated to decline from 4.9 per cent per annum during 1980-1985 to 2.8 per cent per annum during 1995-2000. In the high variant, the decline in Dhaka's rate of population growth was much more modest - from 5.8 per cent per annum during 1980-1985 to 4.9 per cent during 1995-2000.

II. THE ECONOMY

A. Historical background and development of the city's economic base

The origins of Dhaka City can be traced to the first millenium
B.C. However, little is known of its pre-Moghul history. Because of
Dhaka's strategic location on a major trade route between India and the
East and its direct water link to the Bay of Bengal, Dhaka developed as
an important trading centre during the sixteenth and seventeenth
centuries. In 1674, the British East India Company took over
administration of Dhaka and the surrounding region. During nearly two
centuries of British rule, local industries – such as the handloom
operations that supplied fine silks and cottons for European markets –
were displaced by British factory production, and East Bengal (the part
of Bengal that eventually became the nation of Bangladesh) was gradually
transformed into an agricultural hinterland and supplier of cheap raw
materials (Ehrhart, 1983). Whereas Calcutta (in West Bengal) developed
into an important regional and world trading centre, Dhaka's role
continued to be that of a local market centre for a rich agricultural
delta hinterland and of a district headquarters and educational and
cultural centre for East Bengal.

Following partition of the Indian subcontinent in 1947 (which also
resulted in partition of the province of Bengal), East Bengal was
separated from the metropolis of Calcutta, resulting in a massive
disruption of longstanding regional trading patterns. Mainly because of
its pattern of development under colonial rule, Dhaka and its hinterland
entered into a union to form Pakistan as an agrarian-based society.
Although self-sufficient in rice and a producer of 80 per cent of the
world's jute, the area had a very small industrial sector and few
commercial operations.

During 1947-1971, between partition and independence, Dhaka began
to industrialize gradually, and a number of jute mills, textile mills
and fertilizer factories were established. Moreover, Government offices
proliferated in a city that was designated the second capital of
Pakistan. Following its separation from Pakistan in 1971, however, the
new nation of Bangladesh faced serious economic difficulties: the
railroad was broken into 300 unconnected parts; the ports were blocked
and power and communications networks disrupted; there was a significant
reduction in the output of the main crops; food was in sort supply; and
prices were sharply rising. Moreover, manufacturing output in the Dhaka
area was so severely affected that it did not return to pre-1971 levels
until the late 1970s.

Currently, jute processing and textiles, the two principal
industrial groups in the country, are centred in Dhaka. Indeed, 38 per
cent of all the jute mills in Bangladesh (employing 49 per cent of total

jute mill labourers), 55 per cent of textile mills, and 31 per cent of total registered factories by major industrial group are located in Dhaka District (Bangladesh Bureau of Statistics, 1983).

B. Recent performance of the economy

The jute industry, on which Dhaka is still heavily dependent, has been plagued by high operating costs, low capacity utilization, wastage due to poor quality of raw jute, and deteriorating labour productivity, which halved during the 1970s (Richardson, 1984). The heavy reliance of the country as a whole upon the jute trade makes world market conditions of critical importance. During 1980/81 and 1981/82 output fell because of unfavourable weather. Two years of recovery followed, but the poor weather of 1984/1985 damaged or destroyed large areas of jute, resulting in the lowest crop for many years. During 1985/86, when a bumper crop was expected, world prices fell sharply. Low prices induce smaller crop yields, and this boosts prices, but the overall cyclical pattern harms long-term prospects for the industry. For example, end users, especially in the industrialised countries, turn to synthetic materials when jute prices are high, but are less likely to revert to jute when prices are low (The Economist Intelligence Unit, 1986).

The second largest industry, cotton textiles, which together with jute accounts for two-thirds of manufacturing jobs, relies heavily on imported raw materials. In recent years there has been a proliferation of small export-oriented garment industries. By 1984/85 clothing had emerged as an important non-traditional export item, accounting for 14 per cent of the total, and making garments the third most important export after jute goods and raw jute (The Economist Intelligence Unit, 1986). However, Bangladesh has been so successful that there are already protectionist measures in place in several importing countries to restrict the level of Bangladeshi exports. These circumstances suggest that the garment industry cannot continue to expand as rapidly as it recently has been expanding. The food processing sector is also important, although it is geared primarily to domestic needs. Dhaka's industrial sector as a whole has been adversely affected by an inadequate supply of raw materials, equipment breakdowns, frequent power failures, and a shortage of managers and skilled workers (Government of Bangladesh, ADB and UNDP, 1981).

As for additional factors, remittances from Bangladeshis working overseas have recently shown some recovery, although the long-term prospects are uncertain. Foreign aid continues to make up about 40 per cent of the Government's receipts, 50 per cent of the country's foreign-exchange income, and 90 per cent of its development budget.

Partly upon the urging of aid donors, the Government has adopted several policies in recent years aimed at stimulating growth. A number of industries have been privatised (e.g., 33 out of 71 Government-owned jute mills and 22 out of 52 cotton mills) whereas subsidies, e.g., on food and fertiliser, have been cut.

C. Spatial structure of the metropolitan region

The spatial structure of the Dhaka Metropolitan Area is a function of many factors, including natural/topographical features, the urban land market, housing and resettlement policies, the transportation system and, to a lesser extent, industrial location policies. Old Dhaka, the historic urban core of Dhaka City, is an area of 5.6 square kilometres which runs along the north bank of the Burhi Ganga River. That high density area, which doubled in population between 1961 and 1974, contains a complex mixture of land uses and settlement patterns. Roads are narrow and congested, and physical infrastructure is overloaded and inadequately maintained. In addition to Old Dhaka, densification has occurred in old, unplanned commercial and industrial areas that are centrally located (e.g., Hazaribagh, to the west of Old Dhaka, and Jinjara, across the river).

Government offices and banks, insurance companies and private-sector firms are concentrated in the Dilkusha, Motijheel and Segunbaicha areas, which constitute the modern Central Business District (CBD), and to a lesser extent at Tejgaon, Kawran Bazaar, and the New Capital area. Beyond the CBD, Dhaka has grown by absorbing adjoining administrative areas (including Gulshan, Sultanganj canton, Tejgaon, Purana Paltan, and Mirpur), which have generally had higher rates of growth than the central city. To the northwest, Mirpur contains a number of planned public-sector residential schemes for low-income families and recent formal-sector industry, as well as small pockets of uncontrolled residential settlement. The adjacent cantonment is a low-density area that contains various Government institutions, airports, and defense establishments.

The eastern fringe of Dhaka City consists of low density, unplanned residential and agricultural areas. Most jute mills are located to the east of Dhaka, along the Lakhya River from Narayanganj to beyond Ghorasal. (The riverine locations were chosen to enable easy access for raw jute, which is transported by boat.) The location of cotton mills is similar to that of jute mills, except that Tongi (in the north) is also an important centre. To the south of Old Dhaka, the road between Demra and Narang City contains hundreds of formal-sector manufacturing establishments, including one of the largest jute mills in Asia.

D. The sectoral and spatial distribution of jobs

There is no reliable source of data on employment in the Dhaka Metropolitan Area. The study carried out by the Government, ADB and UNDP used census data, surveys carried out by the Bureau of Manpower, Employment and Training surveys, and surveys of major industries and government employment to derive a 1980 estimate of 1,270,000 workers in the study area, distributed as follows: agriculture, 3.1 per cent; manufacturing, 22.8 per cent; utilities, construction and transport, 21.3 per cent; government, 13.4 per cent; services, 39.4 per cent. Of the total, only 35 per cent were estimated to be in the formal sector (and three quarters of those jobs were concentrated in two sectors, government and manufacturing). Of the remaining 65 per cent of jobs in the informal sector (or, a total of some 800,000 jobs in the study area), the largest concentration was in transport (particularly in tricycle rickshaws, which is a point of entry into the labour market for large numbers of recent rural/urban migrants), followed by street peddling and day labour.

A major feature of the distribution of employment in the Dhaka area is that the manufacturing/non-manufacturing split is not uniform over the metropolitan area. Whereas a majority of the jobs in government and in banking, insurance and finance are to be found in the CBD (i.e., in the Dilkusha, Motijheel and Segunbaicha areas), almost three quarters of formal-sector manufacturing jobs are located outside Dhaka municipality in Narayanganj, Tongi and Kaliganj (Government of Bangladesh, ADB and UNDP, 1981).

E. The city in the region and in the national urban context

Dhaka accounts for nearly one half of Bangladesh's total formal sector manufacturing employment, as well as nearly half of total jobs in the textile industry (with jute goods being the leading sub-sector). However, the capital does not dominate those industries as much as it does some smaller activities, such as rubber products (where Dhaka accounts for nearly 100 per cent of total jobs), furniture (97 per cent), publishing (96 per cent), footwear (84 per cent), leather goods (82 per cent), and electrical machinery (72 per cent) (Richardson, 1984). The concentration of manufacturing activities can be explained by the fact that much of the nation's scarce managerial talent, and many of its skilled and experienced workers and industrial support services, are located in the Dhaka area. In spite of government efforts to promote decentralization, the greater part of new manufacturing investment is likely to seek a Dhaka or near Dhaka location in the interests of efficiency. That will be particularly true of private-sector investment which will want to avoid possible financial

risks (Richardson, 1984). Moreover, the Government's announced short-term national industrial strategy of placing emphasis on rehabilitation of existing enterprises and improving capacity utilization will probably mean that Dhaka's pre-eminence in manufacturing will continue.

Chittagong, the second largest city in Bangladesh, is a little more than half the size of Dhaka, with a population of 1,495,000 in 1981. It is the country's principal port and is the outlet for a long narrow hinterland extending north-south up to the tea-growing area of Sylhet. Well-connected to inland road, rail, river and air routes, Chittagong port is currently being improved and is the site of the country's first export processing zone. The country's third largest city, Khulna, had a population of 671,000 in 1981. Khulna's economy was severely disrupted after partition and it has never completely recovered. Indeed, Khulna's industries now have a greater excess capacity than those of any other city in Bangladesh. Urban growth in Bangladesh has only recently affected medium-sized cities (in 1981 Bangladesh had 10 cities in the 100,000-200,000 range), which have been mainly rural service centres. Many of these centres are likely to experience significant growth problems during the next two decades.

III. DECENTRALIZATION AND LOCATION

A. The evolution of spatial strategies

During 1947-1971, between partition and independence, relatively little attention was given to urban development or to the regional impact of investment in Dhaka and its hinterland. A master plan covering an area of 514 square kilometres, which was prepared by a group of British town planning consultants in 1959, is nominally still in use, although it is largely outdated. For example, a number of areas identified for development in the master plan - e.g., the Uttara Model Town and the area north of Tongi - were never developed; instead, there was substantial unplanned growth around the edges of the city. More strikingly, the master plan assumed that Dhaka's population would grow at a moderate rate (1.75 per cent per annum) and would continue to spread outward at current densities, whereas the actual trend was very different. Dhaka's population grew very rapidly (see table 1), there was an extreme increase in densities in some areas, and then rapid growth at much lower densities on the eastern and southern fringes.

In addition to the master plan, the Government's major initiative in relation to spatial planning was the adoption of policies designed to influence the location of manufacturing industries. Specifically, the Government provided serviced industrial land, offered a package of fiscal incentives to induce industries to locate in less developed areas, and issued directives to public sector industrial corporations that new establishments should be located outside of Dhaka. In the Dhaka Metropolitan Region, new industrial areas were established at several peripheral locations: at Tejgaon, an industrial area built up in the early 1960s in conformity with the master plan, which is now fully occupied; at Tongi, which is the site of two separate industrial areas (one developed by the Dhaka Improvement Trust (DIT) as part of the implementation of the master plan and the other by the Bangladesh Small and Cottage Industries Corporation); at Postogola, which was planned to accommodate small manufacturing firms relocating from residential areas in Dhaka City; and at Shyampur, an area where land was acquired by DIT in the early 1960s but which is only now being developed.

The next major step in the urban planning process was the Dhaka Metropolitan Area Integrated Urban Development Project, which was prepared and funded jointly by the Government of Bangladesh, the Asian Development Bank (ADB) and the United Nations Development Programme (UNDP). The project, also referred to in this paper as the Dhaka Metropolitan Area study, or as simply the study, evolved from a series of missions in the late 1960s which were chiefly concerned with storm-water drainage and flood protection in Dhaka City. Although the study was interrupted by the outbreak of the War of Independence (1971),

it resumed on a much broader scale in the mid 1970s. The primary objective of the project, as set out in the terms of reference, was to prepare a long-term urban development strategy which would guide public authorities and private agencies involved in the development of Dhaka.

With respect to methodology, the study began by examining existing features of Dhaka City which had to be taken into account in strategic planning. The following facts were noted: there was inertia imposed by the existing urban structure; formal sector employment and income levels were very low (hence an essential requirement of any strategy was that it should actively stimulate employment and should pay explicit attention to the basic needs of the city's poor); resources for investment were likely to remain limited throughout the planning period; land was allocated by unchecked market mechanisms and was priced beyond the means of all but the highest income groups; and there was no strategic planning authority for the Dhaka area. The study next identified a number of broad urban development objectives, which included ensuring that the city was able to perform efficiently its essential role in national development; achieving a balance between urban population and urban employment; providing for the basic needs of the urban population and securing a more equitable distribution of resources between income groups; and providing an urban framework capable of accommodating industial and service requirements after the year 2000.

Having identified existing critical factors and defined major urban development objectives, the study then undertook a first-stage evaluation, examining the following nine possible options for the future growth of the metropolitan region:

(a) Continuation of current trends - i.e., sustained peripheral growth of the city with limited expansion towards Tongi and Joydebpur;

(b) Peri-urban development - i.e., low density resettlement with intensive agricultural production over an extensive area surrounding the city;

(c) Comprehensive flood-control protection of the existing city and the northern, eastern and western development areas by enclosing embankments;

(d) The same as in (c), but with the addition of protection by embankments of the Keraniganj area and the Dhaka/Narayanganj/Demra triangle;

(e) Northern expansion - i.e., development of the Tongi/Joydebpur area;

(f)   The same as in (e), but with the addition of an improved transportation facility linking Joydebpur and Narayanganj;

(g)   Construction of a new satellite city;

(h)   Sub-regional dispersal - i.e., decentralization of urban development to the maximum number of existing urban centres in the metropolitan region;

(i)   Minimization of urban growth - i.e., limitation of urban population growth by reducing the level of investment in Dhaka in favour of rural development.

Each of the above options was then examined in the light of the following questions:

(a)   Did the strategy facilitate employment creation and make the most effective use of the probable growth and distribution of employment?;

(b)   Did the strategy provide for an economically and socially effective use of public and private investment and efficient use of land?;

(c)   Was the total administrative effort required likely to be excessive?

On the basis of the evaluation, it was determined that the options that required large-scale decentralization of urban development away from the existing city were probably unrealistic. The remaining options were then divided into three alternatives scenarios which were considered to be the most workable: scenario A, which involved extensive development of land immediately adjoining the city by providing comprehensive flood protection; scenario B, which involved continuing peripheral expansion without flood protection; and scenario C, which involved expansion of the city to the north and west on land that did not require comprehensive flood protection.

In a second-stage evaluation, a more detailed set of evaluation criteria was drawn up. They involved an estimation of costs (e.g., cost of flood protection, land acquisition, provision of services, and transportation); the primary benefits that could be expected to be achieved (particularly in regard to employment creation, access to employment, living conditions, access to services, effect on agriculture in the subregion, and environmental improvement); difficulties likely to be faced at the implementation stage (particularly in regard to capital availability, recovery of costs, technology requirements, timing, legal

requirements, and institutional requirements); and potential for
flexibility. Following the second-stage evaluation, the project
concluded that strategy A (the comprehensive flood protection strategy)
would require substantial capital investment. Strategy B (peripheral
expansion of the city without flood protection) could continue for less
than 10 years before one of the other alternatives would have to be
adopted to accommodate long-term growth. Strategy C (the northern
expansion strategy) would require a lower level of resource allocation
and, in the long term, would be capable of accommodating future growth
and industrial expansion. The study ultimately concluded that a
combination of strategies B and C would produce a balance of
advantages. Specifically, it recommended development of a northern
corridor between Tongi and Joydebpur as the principal channel for
long-term growth. Such a strategy would hopefully facilitate future
industrial and commercial development and would minimize the need for
flood protection investments.

Unfortunately for the implementation of the project, the follow-up
mission took place during the week when the President of Bangladesh was
assassinated. Moreover, there were a number of internal disagreements
within the participating international organizations regarding follow-up
activities. Probably the net impact of the study was twofold: it
generated a large body of data which have served as something of a
private data base for Government officials, and it made policy makers
more aware of the dimensions of urban problems and the need for change.

B. Current spatial strategies

With respect to current spatial planning strategies, the Dhaka
Improvement Trust (DIT) is hoping to prepare an updated master plan -
actually, a structure plan, which would differ from the 1959 master plan
by concentrating only on the broad structure of the city and not on the
details of individual development areas (Interview with Mr. A.Z.M.
Shabuddin Mahmood, Director, Dhaka Improvement Trust, April 1985).
Given financial constraints, however, it is unlikely that a
comprehensive structure plan will be prepared by DIT in the near
future. As for the recommendations of the Dhaka Metropolitan Area
study, the overall pattern of population distribution has already
diverged considerably from the preferred strategy identified in the
study. To cite only one example: the study recommended that in the
short term (i.e., 1980 to around 1985) the area around the new Kumitola
airport should be planned as a largely low-income, residential area and
not as a high-income residential area for persons commuting to Dhaka.
However, the latter has been developing as a high income area in recent
years. Where the Dhaka Metropolitan Area study has had its greatest
impact is on the formulation of specific projects, which have been

mainly designed to accommodate growth rather than to influence development. For example, a number of shelter projects (e.g., a new large-scale housing development at Mirpur and area upgrading in sections of the old city - both of which are discussed below in section IV, part C) are being carried out along the lines recommended in the study.

With respect to industrial location policies and instruments, there are three policy measures which give preferential treatment to areas outside Dhaka. They are: a discretionary reduction in the import duties on capital goods from 50 per cent or more to 15 per cent in Dhaka and the next largest urban centres (Chittagong and Khulna) and to 2.5 per cent elsewhere; a nine-year tax holiday from company taxes, compared to a five-year tax holiday in Dhaka, Chittagong and Khulna; and preference to areas outside the major cities in long-term capital financing by the public development financial institutions. The success of those measures has been quite limited. A major difficulty with the differential incentive schemes is that they have resulted in a "boundary" problem - i.e., firms have been artificially induced to locate just outside Dhaka in order to benefit from less developed area status. The tax holiday incentive has had little effect because few firms pay much income tax (multinationals pay an average of 7 per cent of annual sales, while local firms pay less than 1.5 per cent) (Richardson, 1984).

At the macro industrial level, the Government has initiated a set of reforms aimed at improving industry's prospects. They include the New Industrial Policy introduced in mid 1982, involving the return of public enterprises (e.g., jute and cotton textile industries) to private ownership, the reorganization and restructuring of public industrial enterprises, and measures to attract foreign investment. Although they are not designed as instruments of spatial policy, they will undoubtedly have spatial impacts and will probably benefit Dhaka, since, as discussed above, private investors will want to avoid financial risks.

The Government of Bangladesh currently appears to be treating the upazila (sub-district) decentralization programme as the major spatial development strategy for the country. Its goal is to create more than 470 upazilas, with populations ranging from 10,000 to nearly 600,000, but averaging around 186,000. The upazilas are intended to be the major local governmental unit, with functions and staff transferred from higher levels of government, some revenue-raising powers, and a council (parishad) with a directly elected chairmen. An impressive start has been made. By 1987 more than $ 200 million had been spent on upazila infrastructure. Of course, it is still uncertain whether upazilas can generate income and jobs for the rural poor and thereby retain at least some proportion of potential rural/urban migrants. There is a possibility that the impact of upazila decentralization on urban development could be negative, in that it could further strain scarce public capital resources.

IV. ISSUES AND SECTORS

A. The labour market

According to recent labour force projections, the Dhaka economy will need to absorb about 2,200,000 workers by the end of the century (Richardson, 1984.) That will be an extremely difficult task. The Dhaka Metropolitan Area Integrated Urban Development study concluded that there was no sector of the urban economy which had grown rapidly during the 1970s whose performance could be expected to continue during the 1980s. As for the absorptive capacity of various sectors, the proportion of the labour force employed in agriculture in Dhaka District declined from 62.3 to 35.5 per cent during 1961-1981, and is expected to decline still further as the cropped area is reduced. Large and medium-sized manufacturing units have had only modest increases in employment. Moreover, the jute industry, which is the largest industrial employer, is expected to reduce its labour force as efficiency improves (Government of Bangladesh, ADB and UNDP, 1981). Although employment in small-scale industries and the informal sector is expected to continue to expand, the fall in real incomes per capita since independence will probably limit how rapidly those activities can grow. Whereas the government employment base more than doubled in the first decade following independence, it has recently been declining in Dhaka as administrative decentralization has forged ahead. The business services sector could possibly become more important, although much will depend on the degree of success of the Government's privatization strategy (Richardson, 1984).

There are a number of additional uncertainties regarding future employment growth. Foremost among them is the impact of the upazila programme and the Government's success in creating jobs in rural areas. Another major uncertainty is whether the migration of temporary workers to the Middle East or other regions will continue on any significant scale. The return of large numbers of expatriate workers to the Dhaka area would have a serious impact on the Dhaka labour market. Also, if - contrary to assumptions - the current low female participation rates were to increase as a result of a changing role for women in society, Dhaka's labour market would be much larger than projected.

Because it accounts for about 65 per cent of all jobs, the informal sector will play a major role in future labour absorption in Dhaka. The Integrated Urban Development study recommended that the Government should not take any action - such as banning or limiting rickshaws in the interests of traffic management - which would constrain or hinder the informal sector.

B. Urban land

Land is a critical constraint for development in Dhaka and the surrounding areas. The city is bounded on the west and south by the flood plain of the Burhi Ganga River and on the east by the flood plain of the Balu River. Both areas are flooded (1.5-4 metres) for up to four months of the year. Most of the land above the flood line and within a reasonable distance of the central core is either already in urban use or is of high agricultural value.

Competing demands for the scarce supply of non-flood-prone land are difficult to resolve. The municipal authorities are concerned with providing land and shelter for a population whose residential location options are severely limited by the inability to pay for public transport. At the same time, there is an urgent need to ensure an adequate food supply for Dhaka City's rapidly increasing population, which grew at an average annual rate of 8 per cent during the most recent intercensal period (1974-1981). In recent years, in spite of concern over protecting agricultural land, the conversion of land around Dhaka City has been occurring at a rapid rate, mainly because it is more profitable for small farmers in the area to sell off their land and move to the city. That is chiefly because rent for houses has risen much faster than the price of food, whereas wages in agriculture are less than one quarter of wages in other sectors (Government of Bangladesh, ADB and UNDP, 1981).

To compound the problem, there has been intensive speculation in land in recent years by individuals, housing companies and co-operatives, and especially by Bangladeshis working abroad. Because of the lack of alternative opportunities for investment and the fact that land is regarded as a secure hedge against inflation, roughly one third of the remittances of expatriate workers have been used to purchase land. Although there is an awareness of the undesirable effects of expatriate earnings on the domestic economy and on the urban land market, in particular, government policy regarding those earnings has of necessity been guided mainly by the need to improve the country's overall balance of payments (Government of Bangladesh, ADB and UNDP, 1981).

Because the main bidders in the urban land market in Dhaka City are expatriate workers and the well-to-do, market prices of land have risen about 40-60 per cent faster than the prices of other goods and servies and are now completely out of line with per capita income levels. 6/ The concentration of large amounts of high priced land in the hands of speculators has led to an artificial scarcity, which has increased the price of land still further - to such a point that even a small plot is beyond the means of the highest paid civil servant. Indeed, the

Integrated Urban Development study concluded that, without the active intervention of the Government in the urban land market, the majority of Dhaka residents did not have any hope of owning land or a house within the metropolitan area. However, a major problem is the fact that the Government owns very little land - only about 7 per cent of the land in Dhaka District - and has limited ability to invervene in the land market. Under current legislation (the Land Acquisition Act of 1894 and the East Bengal Emergency Requisition of Property Act of 1948), the Government must acquire land at market prices, often with considerable delay. The process is very time-consuming and generally favours the landowners.

A number of suggestions have been made by experts regarding ways in which the Government might increase its leverage in the urban land market (Government of Bangladesh, ADB and UNDP, 1981; Richardson, 1984). They include the purchase of development rights by public agencies, land banking, land readjustment, betterment taxes, and taxation of vacant land (which, not being currently taxed, is generally withheld from development by speculators). However, most of the policy options are likely to be politically difficult to implement because of their unacceptability to the landowners who are in favour of maintaining the status quo. To deal with this opposition, the Government has discussed the possibility of conducting a public relations campaign to counteract lobbying by landowners. As an interim measure, in the absence of a radical urban land policy, the Urban Development Directorate (UDD) has suggested that local authorities should be allowed to acquire roadside land. Over the longer term, the Integrated Urban Development study concluded that flooded areas would need to be reclaimed and some agricultural land would have to be sacrificed.

C. Housing

Dhaka has a serious housing shortage. Because of limited resources, high standards for construction and the high price of urban land, the provision of formal-sector housing is running at only about 4 per cent of annual needs (Richardson, 1984). As of 1980, according to the World Bank, the Government had constructed a total of 35,000 rental units in Dhaka City. They were located in central areas of the city in four or five-storey walk-up buildings and were mainly reserved for civil servants. The Government had also constructed a total of 27,000 owner-occupied units for specialized groups such as refugees and relocated squatters. In addition, the Housing and Settlement Directorate of the Ministry of Public Works had developed serviced lots for individual house construction; again, however, the chief beneficiaries of the programme were civil servants.

Over the years, the bulk of conventional housing in Dhaka City has been constructed by the private sector. As of 1980, 84 per cent of the total housing stock consisted of private housing units (slightly more than half of them were owner-occupied, and the rest were rental units). In contrast, the World Bank found that only 7 per cent of Dhaka's housing stock consisted of public rental housing; 3 per cent was public owner-occupied housing, 2 per cent was squatter housing, and 4 per cent consisted of other types of housing (e.g., boats). Although the Government has not provided any incentives to the private sector to promote the faster delivery of housing units, that sector of the housing market has grown fairly rapidly in recent years, mainly as a result of the lack of other opportunities for investment. Because of the rapid rise in rents, which nearly doubled between 1981 and 1985 - typical rents went from Tk. 2,000 to about Tk. 4,000 - investors have found it very profitable to construct rental housing. In some instances, entire slum communities have sprung up as a result of the efforts of enterprising landlords who develop the land, build kutcha housing with rudimentary services and then rent the structures to lower-income households. Rents are generally below the annual interest cost of the capitalized land value, which is possible because landlords obtain a high return on dwelling construction costs and, since the dwellings are temporary, are willing to hold the land for future capital gains.

This raises an interesting point. Because of the high price of land in the Dhaka area, there is little outright squatting. In 1975, some 200,000 squatters living on public land were forcibly removed by the Government and resettled in several locations on the outskirts of Dhaka City (e.g., in Dattapara, Tongi, Mirpur, and Demra) (Government of Bangladesh, ADB and UNDPD, 1981). Currently, the Government maintains a policy of removing squatters who have encroached on public areas, such as along the railway lines. Squatters generally refrain from settling on private land, however, from which they would swiftly be removed. Hence, in an area that might appear to be a low-income squatter area, the majority of residents typically have some right of tenure.

The Second Five-Year Plan called for a shift in the Government's housing policy - from the construction of high-quality completed housing units (mainly for civil servants) to the provision of serviced land, the adoption of lower standards, and the introduction of measures for improved cost recovery. The Plan also underlined the need not only to increase substantially the housing stock for lower-income households but also to conserve and improve existing investments in dwellings and services. The Urban Development Directorate (UDD) of the Ministry of Works is currently undertaking a housing development project, assisted by the United Nations Development Programme (UNDP) and the United Nations Centre for Human Settlements (UNHCS), which serves as the executing agency. The project is an outgrowth of the Integrated Urban

Development study, which recommended that several areas within Old Dhaka be given priority for upgrading and that, in the short term, new urban development should be concentrated on the periphery, in locations where jobs and basic infrastructure already existed.

Accordingly, the housing development project is focusing on upgrading Islambagh and Shaheednagar, two areas within Old Dhaka that are subject to severe seasonal flooding, have limited vehicular access, and contain the largest concentration of poor living conditions within Old Dhaka. As an initial step, the Government has agreed to construct entry roads on built-up embankments and to fill in areas where existing houses are lower than the level of the road. Over the years, the local residents are expected to gradually add landfill under their houses (which are currently built on stilts as high as six metres), thereby gradually raising the entire flood-prone area.

In line with the recommendation that new low-cost housing be developed in peripheral areas, an undeveloped area of 90 hectares located in Mirpur has been targeted for integrated development. Originally developed in the 1960s as a new satellite town, Mirpur was chosen because it is virtually the only undeveloped site for large-scale housing construction on government-owned land. The project will eventually resettle 2,500 families from a temporary camp that was set up in the area following the Government's squatter eviction operation in 1975 and 3,500 families from another temporary camp in Demra. The Demra households, part of the group of squatters evicted in 1975, are being dislocated as a result of a water project being implemented by the Dhaka Water and Sewerage Authority (WASA) with financial assistance from the World Bank.

Despite the Government's recent emphasis on construction of low-income housing and affordability, there are several constraints that will make it difficult to provide housing on a significant scale for lower income groups. Whereas Bangladesh has always been deficient in modern building materials, there is currently an acute shortage of indigenous construction materials such as timber, bamboo, and thatch. Another constraint is the fact that housing finance is poorly developed. It is estimated that 83 per cent of Dhaka households use their own funds, whereas only 17 per cent receive full or partial loans, mainly because of the low level of savings (Government of Bangladesh, ADB and UNDP, 1981). A further constraint is the land acquisition process, which is complicated, time consuming, and generally favours the landowners. The major constraint is probably the scarcity and high price of urban land, which makes it difficult to provide shelter even for middle-income groups without large subsidies.

D. Water supply and environmental problems

Targets in the Second Five-Year Plan for physical works to increase the water supply in Dhaka City are expected to be achieved. However, because of higher than anticipated population growth, the planned target coverage of the population is not expected to be met. Whereas the target for water supply coverage in Dhaka City was 66 per cent in 1985, it was estimated that coverage would not exceed 59 per cent (Government of the People's Republic of Bangladesh, 1984).

The water supply system in Dhaka City consists of two production systems: a small surface water treatment plant at Chandnighat (which was constructed in 1874 and produces 29 million litres daily) and a more extensive production system which obtains ground water from deep tube wells. By June 1985 it was estimated that 110 production wells would be in operation throughout the city, providing a daily supply of 403 million litres (Government of the People's Republic of Bangladesh, 1984). Although the production system based on wells has worked efficiently, a study conducted as part of the UNDP-assisted water sector master plan project noted that over-extraction of ground water had caused the water level to drop off sharply during the dry season, creating fairly high pumping needs. The study concluded that an excessive decline in water levels in the central Dhaka area would quite possibly occur as pumping stresses increased after the turn of the century. For economic reasons, that condition would place limits on the level of extraction, requiring alternative water supplies to the central area from other sources.

Water is distributed to consumers through 975 kilometres of transmission and distribution lines, 90,000 house connections (mainly in the older areas of the city), and 1,200 common municipal sources (e.g., standpipes). However, many of Dhaka's poorest residents continue to use polluted surface water. Before Dhaka's water supply can be increased to the estimated daily requirement of 670 million to 760 million litres, the municipal authorities must resolve a number of problems. Whereas Dhaka's two water-supply systems have been producing 432 million litres daily, because of systems losses, the population receives only 336 million litres (Government of the People's Republic of Bangladesh, 1984). The large systems losses are directly related to the fact that the municipal authorities have been unable to afford to repair and maintain the system. Another problem is the fact that fewer than one third of accounts are metered, whereas a significant number of illegal hookups have been detected (Interview with Mr. W.A. Waheed, Chief Engineer, Dhaka WASA, April 1985). In an attempt to promote cost recovery, Dhaka WASA, the agency responsible for the operation and maintenance of Dhaka's water supply, constructed 1,000 metered

standpipes in central areas of the city. There was a subsequent dispute, however, between WASA and the Dhaka Municipal Corporation (DMC) over which agency should pay for consumption from the standpipes.

According to the Report of the Working Group on Urban Water Supply Sanitation and Drainage (Government of the People's Republic of Bangladesh, 1984), the water borne sewerage system served only about 18-20 per cent of the population of Dhaka City. Around 30 per cent of the population used a total of 50,000 septic tanks, which typically overflow into the streets and drains during the rainy season. Another 10 per cent used pit latrines and 5 per cent used bucket latrines; the remaining 35 per cent of the population used either surface latrines or did not have any facilities. Sewage and domestic waste water is collected by 24,500 service connections and transported to a central treatment plan at Pagla. Until recently, mainly because many Dhaka residents wanted to avoid paying sewerage hook-up fees, there were only 8,500 legal connections and perhaps an equal number of illegal connections. In 1983, however, as a means of expanding the revenue base, legislation was passed which made payment of hook-up fees compulsory. With a view to improving the sewerage network, a recently approved $ 41.4 million water supply and sanitation project assisted by the World Bank aims at expanding the network of secondary sewers and increasing the number of house connections. The project also includes an innovative low-cost sanitation pilot project which, if successful, will be replicated citywide.

Drainage is one of Dhaka City's most serious problems. Because it is located in a low-lying delta area, the large number of re-entrant valleys bring flood waters into the urban area, particularly in the northern part of the city. That causes heavy financial losses during the rainy season (through property damage and interference with commercial activity) and aggravates already precarious health and sanitation problems. Whereas the city drains naturally rather well, a major problem has been widespread encroachment on the natural water courses, not only by slums but also by commercial buildings. As a result, the water courses have become clogged to such a point that they will be difficult to retrieve. Currently, there is need to re-plan the entire system, clean out the clogged canals, build canals with hard sides to prevent further encroachment, and ensure subsequent enforcement. One expert has suggested that such a canal system would be navigable and might serve as a supplementary transportation system (Interview with Mr. Terry Standley, UNHCS technical advisor, Dhaka, April 1985).

Because of the subsistence character of the Dhaka economy, most industrial and household waste is recycled, hence per capita solid waste production is one of the lowest in the world. Solid waste that is not

re-cycled is collected by street sweepers from open dumping grounds and taken to dumps or sanitary landfills. There is a large amount of illegal dumping, however, along the river banks. Moreover, a particularly serious problem is the concentration in Old Dhaka of small-scale manufacturing units that produce unusable and environmentally harmful final residues. There is considerable pollution of the local rivers by effluent from tanneries, particularly in the Hazaribagh area, and by sugar mills, jute mills, and two thermal power stations in the Gharasal area. The pollutant effects of various agricultural processes are also considerable.

E. Power

Bangladesh is a subsistence-type economy whose commercial energy consumption is among the lowest in the world. Energy use is dominated by non-commercial biomass fuels (e.g., fuel wood, tree residues, agricultural residues), which currently account for 84 per cent of total final energy consumption, and by the domestic sector, which accounts for 72 per cent of total consumption (GOB, Energy Study and Planning Cell, 1984). By the end of the century, economic development is expected to bring about significant changes in current patterns of energy use. Total energy demand is expected to nearly double by the year 2000. Whereas the domestic share is expected to decline to 50 per cent, there will be an offsetting rise in the industrial and commercial share and higher demand for commercial fuels (the results of demand analysis show biomass declining to 57 per cent by the year 2000) (Government of Bangladesh, 1984b). Because Bangladesh has such a huge potential demand for energy and limited energy resources (e.g., no known oil deposits and a limited supply of coal), the Government considers that energy planning is a crucial prerequisite for economic development. The Government has therefore undertaken the Bangladesh Energy Planning Project, with the assistance of UNDP and the Asian Development Bank. The goal of the project is to forecast energy requirements in all major sectors until the end of the century and to establish a national energy planning capability.

As for the current situation regarding energy supply in Dhaka City, the demand for power during peak hours has been about 750 megawatts. The Power Development Board has been able to supply only 660 megawatts on average; hence there has been daily load-shedding of 90 megawatts. As a means of improving the energy supply system, power tariffs were raised 40 per cent between 1982 and 1985. Moreover, the previous energy pricing structure - in which the more energy consumed, the lower the rates - was abolished and a new dual-tariff meter system that charged industrial consumers higher rates was introduced.

One of the chief obstacles to increasing the supply of energy in Dhaka City has been the fact that the Power Development Board has had a 30 per cent systems loss. That is one of the highest rates of loss of any of the world's major metropolitan cities and is mainly the result of illegal power connections, through which an estimated 25 per cent of the total supply is consumed. With a goal of reducing the number of illegal connections and thereby reducing system losses, the Bangladesh Energy Planning Project conducted a study of patterns of household energy consumption. The study concluded that households in the top 40 per cent in terms of income distribution used electricity both for cooking and domestic lighting. Households in the next 10-20 per cent of income distribution used kerosene, paying a fixed fee of about Tk. 45 per month (a significant proportion of total household expenditure) for each kerosene burner, plus the cost of kerosene. The next 20-30 per cent cooked with electricity that was illegally connected, while the poorest 20 per cent cooked with biomass, which they scavenged, or dung, which they purchased. Since energy costs were found to account for a higher proportion of household expenditure among the poor, the study concluded that, without some form of relief, it was likely that households would resort to illegal connections. It was suggested that the poorest households could possibly use coin-operated communal kitchens located at corners. However, that raised the issue of cultural acceptability; moreover, such a pilot project might raise expectations among the urban poor that could not be fulfilled (Interview with Mr. H. Attinger, Project Manager, Bangladesh Energy Planning Project, April 1985).

F. Health and education

The population of Dhaka has a high incidence of bronchitis and other respiratory diseases, diarrhoeal diseases, skin diseases, measles and malnutrition. As of 1981, the Dhaka Metropolitan Area had a total of 710 doctors working in government hospitals (a ratio of 1 per 4,900 inhabitants) and 3,400 hospital beds (a ratio of 1 per thousand inhabitants) (Bangladesh Bureau of Statistics, 1983a). Although there is a decentralized health care network, the system has not functioned as planned. Persons often bypass lower-order health care facilities such as the dispensaries because of what is perceived to be inadequate care, and go directly to one of the city's large and overburdened general hospitals (Government of Bangladesh, ADB and UNDP, 1981). Many of the urban poor receive no medical attention or go to indigeneous doctors, whereas pregnant women normally go to untrained midwives.

Family planning has received high priority in Dhaka and in Bangladesh as a whole. As of 1981, the Dhaka Metropolitan Area had a total of 33 family welfare centres, 36 injection centres, 18 sterilization centres, eight abortion centres and four mobile family

planning centres (Bangladesh Bureau of Statistics, 1983a). During 1982-1983, the most recent year for which data are available, these centres performed a variety of clinical procedures (e.g., insertion of intra-uterine devices, sterilization operations (mainly tubal ligations), Depo-Provera injections, and abortions) and distributed a variety of contraceptives (e.g., oral pills, foam tablets) free of charge. As of 1983 the contraceptive prevalence rate in Dhaka was estimated to be 22 per cent, and officials estimated that it was probably close to 25 per cent in 1985 (Interview with Mr. M.A. Mabud, Deputy Chief, Population Planning Wing, Planning Commission, April 1985).

Although the Government of Bangladesh has come under pressure in recent years from the World Bank and other international organizations to intensify its programme of population control, a report published in 1985 by the London-based Bangladesh International Action Group claimed that the family planning incentive system in Bangladesh had led to coercion, including the linking of sterilization to food aid. The report acknowledged that the linking of food aid and sterilization was not government policy, but claimed that it was the logical outcome of an incentive system which imposed penalties on family planning personnel who failed to meet monthly sterilization targets. Concerned that the principle of free and informed choice in family planning was being threatened, several major Western donors temporarily withheld funds during 1985 from a $ 270 million World Bank family planning programme. The Bangladesh Government subsequently noted that it would abolish penalties for family planning workers who failed to meet monthly sterilization targets and would make a number of other minor changes in its incentive system.

Dhaka has low levels of literacy: as of 1974, 49 per cent of the adult population in the urban areas of Dhaka district and 25 per cent of the rural population was classified as literate. The city has 562 primary schools, with an enrolment of 187,000 students, and 229 secondary schools, with 162,000 students (Bangladesh Bureau of Statistics, 1983). However, the Department of Public Instruction estimates that the drop-out rate is 75 per cent of total primary enrolment within the first five years - a proportion that is roughly similar to the national drop-out rate.

G. Transport

Dhaka's transport patterns are fairly typical of a society that has very low levels of per capita income. According to a study of the urban poor conducted for the United Nations Children's Fund (UNICEF) by the Centre for Urban Studies, more than 80 per cent of residents in the study area could not afford to pay for any type of transportation and

travelled to their place of work on foot (Centre for Urban Studies, 1979). Although it is not known what proportion of the total population travels on foot, it is clear that the inability of residents to pay for public transport to take them to their place of work is responsible for the very high densities in central areas.

For those who can afford to pay only a minimal amount for public transport, Dhaka's transport needs are more or less satisfactorily met by the tricycle rickshaw system. As of 1981, the city had an estimated 55,000 tricycle rickshaws, 3,200 auto-rickshaws, 1,900 buses and 3,800 trucks (Government of Bangladesh, ADB and UNDP, 1981). Tricycle rickshaws not only provide affordable transportation for the masses but also conserve energy, because they do not consume fossil fuels. They function effectively on narrow streets (e.g., in Old Dhaka) that are unsuitable for motorized vehicles. In addition, because they are an important source of employment, providing work for an estimated 125,000 rickshaw pullers and 15,000 owners, builders and mechanics, it is generally acknowledged that any attempt to limit their use would impose severe economic hardships. Of course, a problem arises from the fact that the mix of transport modes - rickshaws, bicycles, bullock carts, push carts and other slow moving vehicles - creates severe traffic congestion, particularly in the narrow, crowded streets of Old Dhaka. Moreover, there is a large number of traffic accidents and traffic deaths: 2,800 accidents during 1982-1983 and 1,100 deaths (Bangladesh Bureau of Statistics, 1983). It is generally believed, however, that those problems could be relieved by better traffic management and by stricter licensing of rickshaws.

Outside severely congested Old Dhaka, the road network is considered to be more or less adequate, particularly given the low level of automobile ownership, which is not expected to increase significantly over the next 20 years. The Dhaka Metropolitan Area Integrated Urban Development study (1981) concluded that there was need for a larger number of buses and for at least 45 - and perhaps as many as 90 - additional river launches. The existing river launches are seriously overcrowded and sometimes sink, causing significant loss of life.

One of the major ongoing projects in Dhaka in the transportation sector is the construction of the Meghna Bridge. When completed, the bridge will shorten the journey time between Dhaka and Chittagong by about two hours, and will open up new areas where the Government wants to develop land. Although some critics of the Meghna Bridge proposed construction of a bridge at an alternative location - e.g., between Old Dhaka and the populous Jinjara area in the south, where it would have benefited more people - its supporters emphasized that it would still be cheaper for the majority of Dhaka residents to take launches across the river than to take rickshaws across the bridge.

IV. RESOURCES AND MANAGEMENT

A. Public investment

Dhaka receives a disproportionate share of national public investment (a 20 per cent share for the District, with its 11.6 per cent of the population) and higher central government grants per capita. In addition, Dhaka District receives 55-60 per cent of the national physical planning and housing allocation, but has only 30.5 per cent of the urban population (Richardson, 1984). Subsidies to food, industrial establishments, and public utilities also strongly favour Dhaka.

It has generally been the view of international donors that the rural areas of Bangladesh should receive a larger share of national resources and that investment in Dhaka and other major urban centres (e.g., Chittagong) should be reduced. The Dhaka Metropolitan Area study recommended, for example, that "ideally, urban investment in Dhaka should be restrained to allow maximum possible allocations to agricultural improvement...". However, on the basis of a new methodology 7/ which quantifies the costs of urbanization (i.e., the costs of housing and intra-urban infrastructure, job creation and interurban infrastructure) and compares those costs with the national pool of investment resources, it has been suggested that Bangladesh may be underinvesting in urbanization, as judged by the share of urban-oriented investment in the annual development plan (Richardson, 1984).

Although the application of the new methodology to a specific country is a major research effort, a crude approximation, which will be described below, was derived for Bangladesh as part of a World Bank-sponsored study on national urban development in Bangladesh (Richardson, 1984). The Integrated Urban Development study found that housing and intra-urban infrastructure and job creation cost estimates for Dhaka (but not interurban infrastructure costs) amounted to about Tk. 90,000 per household in 1980. The estimates were updated to 1983 by adjusting for increases in construction costs, giving a figure of Tk. 126,900. However, the updated estimate excluded the cost of land, which was estimated to amount to about Tk. 25,000 per housheold. Assuming an average household size of six, the per capita cost of urbanization (excluding interurban costs) in 1983 was estimated to be Tk. (126,900 + 25,000) ÷ 6 or Tk. 25,317. To calculate the total cost of urbanization for the period 1983-2000 (in 1983 prices), the urban population increment was multiplied by the per capita cost. (In 1983 the urban population was about 14.6 million; in the year 2000 it is projected to be 35.7 million, implying an increase of 21.1 million.) The per capita cost was then adjusted for location (a rough calculation assumed that Dhaka and Chittagong would have the same costs, while all other cities

would have 15 per cent lower construction costs). To that was added the resources needed for interurban infrastructure, for eliminating the current backlog in infrastructure, for maintenance and for growth mangement. In the absence of detailèd analysis, the additions were acknowledged to be "guesstimates" (Richardson, 1984). In the only two detailed studies completed hitherto (the National Urban Policy Study for Egypt and the National Human Settlements Policy Study for Pakistan), those items accounted for 38-40 per cent. Taking a conservative estimate of 35 per cent for Bangladesh (conservative because topographical and flood-related problems could make interurban transport and communications infrastructure more expensive there than elsewhere) brought the total urbanization cost for Bangladesh over the period 1983-2000 amount to Tk. 696.2 billion (at 1983 prices).

The final step in the anlysis was to compare the urban investment requirements with the investment resource pool. In 1983, investment totalled about Tk. 44,414 million. An annual growth rate in investment of about 4 per cent was then assumed, which was acknowledged to be mildly optimistic (Richardson, 1984). Although the future of foreign aid and the growth of domestic savings were acknowledged to be uncertain, the analysis assumed that foreign aid would continue to be very important, but that over time a modest growth in domestic savings would offset a slight decline in the foreign share of total investment outlays. The final result was an investment resource pool of Tk. 1,138 billion, which implied that urbanization (including urban job creation) would absorb 61.2 per cent of the resource pool.

It is interesting to note that the finding in Bangladesh was more optimistic than that in Egypt, where urbanization absorbed 81 per cent of the resource pool, or in Pakistan, where reduced standards urbanization costs were 116 per cent of the national investment resource pool. However, the conclusion for Bangladesh was subject to several qualifications - namely, that, because the rural population is both absolutely larger and accounts for a higher share of total population there than in the two other countries, the claims of the rural sector on the investment resource pool are likely to be greater. Moreover, the contribution of non-reimbursable foreign aid to Bangladesh's overall investment effort has been very large, and any circumstances which jeopardize that flow of aid would severely undermine the country's capacity to finance urbanization.

B. Resource generation

Dhaka receives about 40 per cent of its budget in grants, about 70 per cent of which are for capital investments and the remainder for operational expenditure. The high proportion of grant funding gives priority to capital projects rather than to more basic services.

Dhaka has numerous problems in regard to resource generation, including a narrow tax base, difficulties in collecting existing taxes (especially from the relatively well-off) and in imposing penalties for evasion, and the overall underpricing of services. The principal source of local revenue is the property tax, which is shared by the national Government and local municipalities. Because property taxes cannot exceed 17 per cent of annual rental value, they have not benefited from the recent escalation in land prices (Government of Bangladesh, ADB and UNDP, 1981). Moreover, assessments generally lag from five to eight years, and only about half the assessed taxes are actually collected. The Dhaka Municipal Corporation also imposes a business license tax. 8/ Other local taxes include taxes on advertisements and vehicles, including rickshaws, carts and cycles. In addition to the property tax, the municipal Government levies rates for street lighting, conservancy and water. A variety of fees are also charged for services provided by local governments (e.g., maintaining municipal markets).

Given the subsistence levels of many Dhaka households, it is unclear whether they can afford to pay for even mimimum levels of urban services. Moreover, full-cost recovery may not be a required medium-term goal in view of the fact that so much of Bangladesh's development programme is financed out of non-reimbursable foreign aid (Richardson, 1984).

C. The institutional context

Urban planning and development in Bangladesh are generally the responsibility of the Ministry of Public Works and Urban Development. The Public Works Department and the Housing and Settlements Directorate are the principal agencies within the Ministry charged with the development of government-sponsored housing and public buildings. The Dhaka Improvement Trust (DIT), a public corporation also operating under the Ministry of Public Works, is the main planning and land development authority for Dhaka. It is responsible for administering the still current but outdated 1959 master plan (based on population projections assuming a growth rate that was only about 30 per cent of the current rate), preparing future master plans, and exercising development control by issuing or refusing building permits. Over the years, DIT has exercised effective control only within its own development areas; elsewhere, development has gone ahead uncontrolled (Richardson, 1984). One of the factors that has limited the activities of DIT is the fact that it receives grants and loans from the Government and has to be self-financing. However, it is prohibited from making a profit on individual projects which could generate funds for new activities. Land purchases made in the 1960s have now been exhausted, and most of the activities of DIT have been residential developments for the relatively

well-off and commercial developments (e.g., shopping centres), plus road-building out of special grants. Moreover, DIT's revenue-generating activities have to be handed over to the municipalities after completion.

The Dhaka Municipal Corporation (DMC), which is under the authority of the Ministry of Local Government and Rural Development, provides urban services such as public health and sanitation, maintenance of public infrastructure, water supply and education. The Dhaka Water and Sewerage Authority (WASA) is charged with maintaining the water supply and sewerage network. There is considerable overlap between the two streams of responsibility, and between many of the individual agencies. For example, both DIT and DMC have some responsibility for urban planning, but their work has rarely been linked.

There has been widespread agreement that there is need for some type of a metropolitan authority with very broad functions for physical development, planning control, resource mobilization and intersectoral co-ordination. Although there was a gazette notification of the establishment of such an authority in the spring of 1985, it is not yet in operation.

CONCLUSION

The population of Bangladesh will continue to grow rapidly through the end of the century, with the most likely population size in the year 2000 in the range of 135-136 million. Urbanization will proceed at a faster rate because the rural areas are incapable of absorbing all future rural population growth. A conservative estimate of the urban population in the year 2000 is 35.7 million, implying an increase of 21.1 million over the 1983 level. This estimate assumes a rate of economic growth averaging the performance achieved since independence. If the economy performs worse than in the recent past, this would undoubtedly result in a higher rate of out-migration from rural areas. If the economy grows much faster than assumed, not only is the urbanization rate also likely to be higher, but there will probably be higher in-migration to the larger, high-cost cities, and particularly to Dhaka.

The growth in the population of the Dhaka (Statistical) Metropolitan Area to probably more than 9 milllion inhabitants by the year 2000 will require substantial investments in housing and intra-urban infrastructure, job creation and interurban infrastructure. At the national level these urbanization costs could amount to Tk. 700 billion (in 1983 prices), which might require more than three-fifths of the national investment resource pool generated between 1983 and the year 2000. Urban-oriented investments will have to receive a much higher share of total investments than the urban population share because per capita urban absorption costs are much higher than rural absorption costs. From this perspective, it is possible that Bangladesh is underinvesting in urbanization, even after allowing for private investment's likely bias in favour of the urban sector. A heavy responsibility for financing urbanization lies on external donors. Because net external economic assistance accounts for more than 10 per cent of GDP and the foreign aid component is 90 per cent of the development budget, international donors will have to become more involved in the urban sectors than in the past if Bangladesh is to cope with the pressures of urbanization.

Any assessment of spatial priorities in an urbanization strategy for Bangladesh must emphasize the role of Dhaka. There is little doubt that Dhaka receives a disproportionate share of public investment and higher central government grants per capita. However, attempts to divert resources to other areas on equity grounds run the risk of impairing the economic efficiency of Dhaka, which is so vital to any strategy to promote national economic growth.

Regardless of future investment levels in the metropolitan area, Dhaka remains the most atypical mega-city in the world. It lacks the cosmopolitan and the modernization characteristics shared by almost all developing country mega-cities. Its transportation system, with its low technology modes that are nevertheless appropriate to current income levels, is indicative. The future of Dhaka is more difficult to predict than that of other mega-cities because of uncertainties about technological transformation with respect to its economic base, spatial structure and urban capital stock, and service delivery systems.

Notes

1/ The Dhaka urban agglomeration (otherwise referred to as Dhaka, or Dhaka City) is an area that runs along the banks of the Burhi Ganga River and extends northwards up to Tongi. The Dhaka Metropolitan Area (DMA) extends over 414.4 sq kms and is comprised of 12 thanas - Cantonment, Demra, Dhanmondi, Gulshan, Kotwali, Lalbagh, Mirpur, Mahammadpur, Motijheel, Ramna, Sutrapur and Tejgon - eight of which are located within the administrative jurisdiction of the Dhaka Municipal Corporation (DMC). The entire Dhaka Metropolitan Area is located within the Dhaka Sadar subdivision, an area of 1,600.6 sq kms, which is located, in turn, within the larger Dhaka District, an area of 7,459 sq kms, which constitutes about one fifth of the total geographical area of Bangladesh.

The concept of a Dhaka (Statistical) Metropolitan Area (SMA) was introduced in the 1981 census. The Dhaka SMA - an area of 1,120.8 sq kms which includes the entire Dhaka Metropolitan Area plus all of Tongi, Narayanganj and Siddirganj thanas as well as those parts of Bandar, Fatullah and Keraniganj thanas that have urban characteristics - was created only for statistical purposes. Dhaka SMA is located within a specified area of Dhaka Sadar, Gazipur and Narayanganj subdivisions.

2/ Average life expectancy in Dhaka is currently estimated at around 55 years. Less than 50 per cent of the population of the Dhaka SMA is literate, according to the 1983/84 Statistical Yearbook of Bangladesh. In 1982/83 the Dhaka SMA had 6.3 telephones per 1,000 inhabitants.

3/ The upazila programme, which commenced in 1983, involves the decentralization of a wide variety of administrative functions to more than 470 upazilas or subdistricts.

4/ The 1974 census defined Dhaka City as including the residential suburbs of Mirpur and Gulshan. Although this definition more or less conformed to the contiguous, solidly built-up area of Dhaka, it did not include the Jinjira area - a built-up area of over 100,000 inhabitants located directly across the river from the original city centre, Narayanganj - an old city located only a few kilometres from central Dhaka and linked to it by contiguous development, and Tongi, a populous industrial area in the north. In addition to these omissions, the Bureau of Statistics concluded that there had been nearly a 20 per cent undercount in Dhaka City. Hence, whereas the population of Dhaka City enumerated in the 1974 census was 1,680,000, the adjusted population was estimated to be 2,004,000.

5/ The data in the Dhaka Metropolitan Area Integrated Urban Development Project study (1981), which is cited extensively throughout this paper, referred to a special area which is different from the Dhaka Metropolitan Area and the Dhaka (Statistical) Metropolitan Area. The study area extended over more than half of the total area of Dhaka district and included the Dhaka urban agglomeration, about three quarters of Dhaka Sadar subdivision, all of Narayanganj subdivision and a small part of Munshiganj subdivision. The urban population of the study area was 2,558,000 in 1974, whereas the total population was 5,465,000.

6/ As of 1984, prime residential land cost Tk. 12 million per acre within Dhaka City and as much as Tk. 1.8 million per acre on the urban periphery.

7/ See Pennsylvania Avenue Development Corporation (PADCO), National Urban Policy Study: Egypt (Washington, D.C., 1982), 2 vols. For a description of the methodolgy employed in the National Human Settlements Study in Pakistan, see Qutub, S. A. and H. W. Richardson, "The costs of urbanization: a case study of Pakistan", Environment and Planning A, vol. 18 (1986), pp. 1089-1113.

8/ In 1982-1983 the Dhaka Municipal Corporation re-assessed rent-value holdings in the old city (where they had not been reassessed since before independence) and issued demand notes to some 15,000 householders. The householders strongly protested, claiming that the DMC had not followed uniform rules (Holiday, 18 May 1983).

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