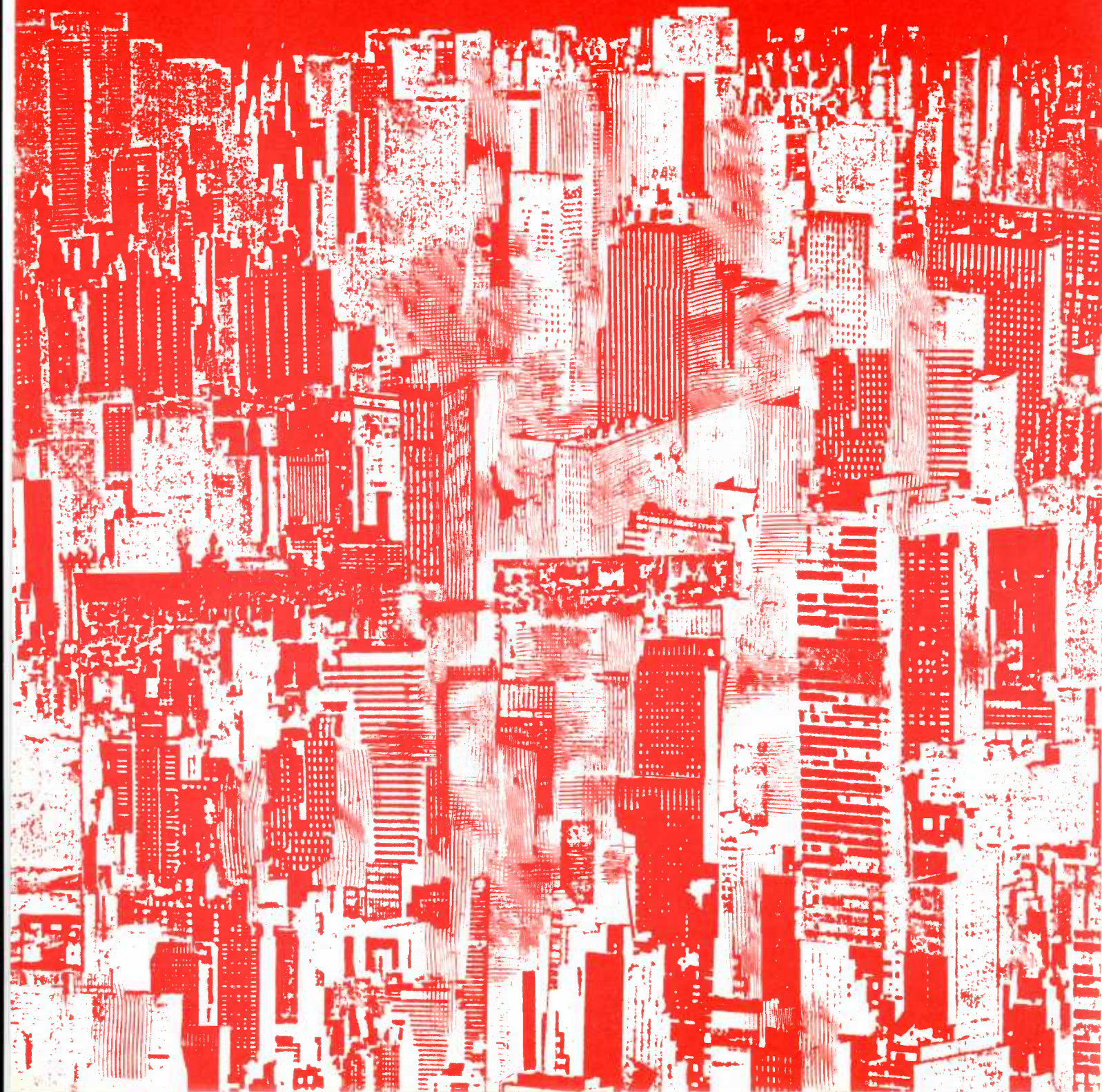




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Population Growth and Policies in Mega-Cities

CALCUTTA



Department of International Economic and Social Affairs

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Population Growth and Policies in Mega-Cities

CALCUTTA



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NOTE

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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 that focus on the population policies and plans of some mega-cities in developing countries, a group of 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 standards of living and the quality of life of the inhabitants of the world's largest cities is a highly complex and multi-faceted 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

^{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.

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 this 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 these investments have 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.

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EXPLANATORY NOTES

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.

The monetary unit in India is the rupee (Rs). Rs 1 crore equals Rs 10 million.

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

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

A point (.) is used to indicate decimals.

The following symbols have been used in the tables:

Two dots (..) indicate that data are not available.

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

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

The following abbreviations have been used:

CMD	Calcutta Metropolitan District
CMDA	Calcutta Metropolitan Development Authority
CMPO	Calcutta Metropolitan Planning Organization
CUA	Calcutta Urban Agglomeration
FPAI	Family Planning Association of India
IDA	International Development Association

INTRODUCTION

India's largest city and, according to United Nations estimates, the eighth largest city in the world in 1980, Calcutta had a population of 9,190,000 in 1981. The larger Calcutta Metropolitan District (CMD) had a population of about 10,300,000. Although Calcutta was replaced by Delhi as the political capital of India in 1911 and by Bombay as the country's major industrial, trading and financial centre in the 1950s, it remains a vitally important city, not only because of its large population but also because of its role as the only major urban centre serving a vast hinterland extending over eastern India and beyond.

Calcutta has been frequently cited by journalists throughout the world as an example of urban pathology, or of what the future may hold for other cities in developing countries that fail to control rapid urban growth. Numerous articles have discussed the scores of thousands of pavement dwellers on the Calcutta streets, the visible evidence of widespread unemployment and absolute poverty, and the severe congestion and infrastructure deficits. ^{1/} Certainly, Calcutta has many complex problems. Industrial stagnation has been quite severe in recent years. More than two thirds of the population have monthly incomes of less than the equivalent of \$35 and at least 1.5 million persons are unemployed. More than one third of the city's inhabitants live in 3,000 unregistered slums or squatter settlements. The city's water supply system and sewerage network constructed by the colonial Government in the nineteenth century are inadequate and obsolescent, and severe drainage problems make much of the city impassable during the monsoon season. Because of its limited road space (the last major road inside the city was built half a century ago) and the large number of slow-moving vehicles, traffic problems are among the worst in India. All these problems are made more acute by the city's very high population densities (more than 1,235 persons per hectare in certain central wards) and by its very low income levels, which make cost recovery very difficult.

^{1/} See, for example, "Calcutta: A city liveable?" People, vol. 11, No. 2 (1984); "Death may haunt its streets, but Calcutta is alive," New York Times, 24 April, 1985.

Despite its considerable problems, Calcutta has made some noteworthy progress in a variety of areas. Since the late 1960s the city has received a number of direct grants from the Government of India and massive financial assistance from various international donor organizations to promote urban development and support urban management projects. In recent years the government of the State of West Bengal has focused on improving municipal administration and increasing municipal revenues. The city's powerful public works agency, the Calcutta Metropolitan Development Authority (CMDA), has implemented scores of projects that have made significant inroads in upgrading slums, in improving water supply, sewerage and drainage, and in relieving traffic and transportation problems. Most recently, there has been an emphasis on strengthening local government and improving links between municipal government and other institutions responsible for urban planning, management and finance.

DEMOGRAPHIC CHARACTERISTICS

A. Population growth

By 1872, the year of India's first census, Calcutta City had grown from a population of some 10,000 inhabitants in the early eighteenth century to a population of 633,000. During the first three decades of the twentieth century, the area of the present Calcutta Metropolitan District (CMD) experienced low and erratic rates of population growth as a result of periodic floods, crop failures, epidemics and other natural disasters. By 1931 the area had a population of 2,540,000. The high rate of growth (5.6 per cent per annum) recorded during the decade 1931-1941 is thought to be an overestimate (for, according to state officials, the 1941 census was politically influenced and population figures for Calcutta City were greatly exaggerated). The much lower rate (2.3 per cent per annum) recorded in the following decade is believed to reflect an underestimate of the CMD's population, which was enumerated as 5,370,000 in 1951. The growth rate of the CMD was moderately low and stable during 1951-1961 (2.3 per cent per annum) and 1961-1971 (2.1 per cent), with the population reaching 8,330,000 by 1971. During 1971-1981, population growth in the CMD continued to decline, and was virtually stagnant in Calcutta City and Howrah (which grew at average annual rates of 0.5 and 0.1 per cent, respectively) (table 1). The total population of the Calcutta Urban Agglomeration was 9,190,000 in 1981, and that of the Calcutta Metropolitan District was approximately 10,300,000. 2/

The distribution of population within the CMD has been changing quite rapidly (table 2). The decline in the share of Calcutta Corporation - from 50 per cent in 1951 to 32 per cent in 1981 - is the

2/ For purposes of clarity, Calcutta City is an area of 104 sq km that is coterminous with the Calcutta Municipal Corporation, which is both a census category and an administrative entity. Calcutta Urban Agglomeration (CUA), which is the census category that corresponds to the metropolitan area, extends over the districts of Calcutta, Twenty-four Parganas, Hooghly, Howrah and Nadia. It includes 3 municipal corporations (Calcutta, Howrah and Chandannagar), 34 municipalities, 2 notified areas and 62 non-municipal urban areas. The Calcutta Metropolitan District (CMD) is an area of 1,450 sq km that includes the Calcutta Urban Agglomeration (or metropolitan area) plus outlying rural areas. It is the planning area under the responsibility of the Calcutta Metropolitan Development Authority (CMDA) and is the geographical area most frequently referred to in this paper.

Table 1. Population size and growth of municipalities
in the Calcutta Metropolitan District, 1961-1981

Municipality	Population size (thousands)			Average annual rate of growth (percentage)	
	1961	1971	1981	1961-1971	1971-1981
East bank					
Calcutta (Corporation)	2927	3149	3305	0.7	0.5
Kanchrapara	69	79	99	1.4	2.3
Halisahar	51	69	99	3.1	3.7
Naihati	58	82	115	3.5	3.4
Bhatpara	148	205	265	3.3	2.6
Garulia	29	44	57	4.3	2.6
North Barrackpore	57	76	82	2.9	0.8
Barrackpore	64	97	116	4.2	1.8
Titagarh	76	88	105	1.5	1.8
Khardah	28	32	45	1.3	3.5
Panihati	94	148	206	4.6	3.4
Kamarhati	125	169	235	3.1	3.4
Baranagar	108	137	170	2.4	2.2
Barasat	29	43	70	4.0	5.0
New Barrackpore	47	-	-
North Dum Dum	38a/	64	96	-	4.1
Dum Dum	20a/	31	34	-	0.9
South Dum Dum	111	174	230	4.6	2.8
Garden Reach	131	154	191	1.6	2.2
Budge-Budge	40	51	70	2.5	3.2
South Suburban	186	273	395	3.9	3.8
Rajapur	9	15	44	5.2	11.3
Baruipur	14	21	26	4.1	2.2
Jadabpur	6	13	252	-	-
West bank					
Howrah (Corporation)	634a/	738	744	-	0.1
Bally	30a/	39a/	148a/	-	-
Bansberia	45	62	89	3.3	3.7
Hooghly-Chinsurah	83	105	129	2.4	2.1
Chandannagar (Corporation)	67	75	102	1.1	3.1
Bhadreswar	35	46	59	2.8	2.5
Champdani	42	59	76	3.5	2.6
Baidyabati	44	54	71	2.1	2.6
Serampore	92	102	127	1.0	2.2
Rishra	39	63	81	4.9	2.5
Konnagar	29	34	51	1.6	4.1
Uttarpara-Kotrung	52	68	80	2.7	1.6
Uluberia	19	20	25	0.5	2.3

Sources: Census of India 1971: General Population Tables (Delhi, Controller of Publications, 1975); Census of India 1981: Final Population Totals (Delhi, Controller of Publications, 1982).

a/ Figures are not comparable because of administrative boundary changes.

Table 2. Distribution of population in the Calcutta Metropolitan District

Municipality	Population share (percentage)			Density (per sq km)
	1951	1971	1981	1981
East bank	69.91	63.06	61.63	-
Calcutta (Corporation)	50.25	37.79	32.09	31617
Kanchrapara	1.06	0.95	0.96	9790
Halisahar	0.65	0.83	0.96	6712
Naihati	1.03	0.99	1.12	26246
Bhatpara	2.51	2.46	2.57	21802
Garulia	0.53	0.53	0.55	14706
North Barrackpore	0.60	0.91	0.80	9710
Barrackpore	0.79	1.16	1.12	9916
Titagarh	1.33	1.06	1.02	32263
Khardah	0.35	0.39	0.44	11663
Panihati	0.92	1.78	2.00	10588
Kamarhati	1.44	2.03	2.28	21437
Baranagar	1.44	1.64	1.65	23925
Barasat	0.30	0.51	0.68	4667
New Barrackpore	-	0.39	0.46	16045
North Dum Dum	0.22	0.77	0.93	6181
Dum Dum	0.26	0.38	0.33	11587
South Dum Dum	1.14	2.09	2.23	15159
Garden Reach	2.03	1.86	1.85	14757
Budge-Budge	0.60	0.61	0.68	8546
South Suburban	1.94	3.27	3.83	12467
Rajapur	0.30	0.41	0.43	-
Baruipur	0.17	0.25	0.25	-
Jadabpur	-	-	2.40	-
West bank	15.49	15.97	17.30	-
Howrah (Corporation)	9.25	8.86	7.22	12104
Bally	-	-	1.44	12649
Bansberia	0.57	0.74	0.86	8441
Hooghly-Chinsurah	1.06	1.26	1.25	8056
Chandannagar (Corporation)	-	-	0.99	10551
Bhadreswar	0.68	0.55	0.57	9097
Chamdani	0.58	0.70	0.74	11768
Baidyabati	0.46	0.65	0.69	7790
Serampore	1.38	1.22	1.23	21650
Rishra	0.51	0.76	0.79	25000
Konnagar	0.38	0.41	0.50	11827
Uttarpara-Kotrung	0.58	0.81	0.78	10979
Uluberia	-	-	0.24	5049
<u>Non-municipal urban areas</u>	14.60	21.97	21.07	
<u>Total</u>	100.00	100.00	100.00	

Sources: CMDA, Development Perspective and Investment Plan (1976); Census of India 1981: Final Population Totals (Delhi, Controller of Publications, 1982).

most striking change. There have also been major changes in the smaller municipalities, such as the growth of North and South Dum Dum, South Suburban, Panihati, Kamarhati and Barrackpore. While the share of the non-municipal areas has remained constant in recent years, a decline in the share of the municipalities on the east bank has been offset by a rise in the share of those on the west bank. Because the core area is on the east bank, this suggests a marked population dispersion trend within the CMD.

Although net migration has ceased to make a significant contribution to population growth, Calcutta still adds a quarter of a million people each year to its population through natural increase. Although information on vital rates is not readily available, there is evidence of a decline in fertility and mortality in urban areas and of widespread fertility and mortality differentials between urban and rural West Bengal. According to government figures derived from the Sample Registration System, the crude birth rate (unadjusted) in urban West Bengal (in which the CMD's population share is 70 per cent) declined from 25.4 live births per 1,000 population in 1971-1973 to 19.9 per 1,000 in 1979-1981, and the crude death rate (unadjusted) declined from 9.5 to 6.6 deaths per 1,000 population over the same period. In contrast, the crude birth rate in rural West Bengal rose from 31.4 per 1,000 in 1974-1976 to 36.3 per 1,000 in 1979-1981, and the crude death rate remained more or less stable around the level of 13 per 1,000.

B. Migration

Calcutta has long been known as a city of migrants. During the first decades of the century, when Calcutta was one of India's more dynamic industrial centres (and the only city of any size within a radius of 500 kilometers from its centre), it drew scores of thousands of migrant workers, mainly from surrounding states. Since the Second World War, however, push factors in the hinterland (including political unrest, religious conflicts and periodic ethnic and language riots) have also been important in inducing migration to Calcutta. The most recent large-scale movement occurred in the wake of the 1971 war between East and West Pakistan, when some 7.5 million refugees entered the Indian State of West Bengal. By 1972 about 6 million of the refugees had returned to the newly created nation of Bangladesh.

With respect to the broad characteristics of migrants in Calcutta, a majority come from the surrounding states of Assam, Bihar, Orissa and Uttar Pradesh and are unattached males, many of whom have left their families behind in the villages. (The presence of large numbers of male migrants in Calcutta is reflected in sex ratios of 140 in Calcutta Corporation and 128 in the metropolitan area.) There is a strong

tendency for migrants from the same states to be concentrated in the same occupations; for example, migrants from Bihar and Uttar Pradesh are disproportionately concentrated in factory employment or in work as rickshaw pullers; Orissa accounts for a majority of the city's plumbers, carpenters and gardeners; Punjabis dominate transport; and so on.

For a number of years, migration has been less a demographic than a political issue for Calcutta's planners. For example, a common argument against promoting industrial development in Calcutta was that it would result in gains that would chiefly benefit migrants (an argument supported by the fact that in many industrial sectors, such as jute, paper, iron and steel, and cotton, more than one half of the labour force was non-Bengali). Of course, the case for the decentralization of industry as a means of stemming in-migration to the metropolitan area has been superseded by events, since there is currently little net migration into the CMD. Now the discussion among planners focuses on the long-term effects of the drying up of migration streams, with some planners predicting a bleak future for a city that ceases to draw in migrants and others welcoming the trend as a chance to clear up the backlog of accumulated problems.

C. Population projections

In preparing the Basic Development Plan in 1966, the Calcutta Metropolitan Planning Organization made a series of projections of the CMD's population up to 1986, based on nine different hypotheses regarding fertility and net in-migration (a single variant was used for mortality). The projection that was chosen as the one most likely to correspond to the actual trend assumed slowly declining fertility and net in-migration of 0.8 per cent per annum, resulting in an average annual rate of growth of 2.5 per cent, which would have given a population of 8.6 million in 1971. However, mainly because migration was lower than assumed, the CMD's population grew at an average annual rate of 2.1 per cent, and the population enumerated in the 1971 census was only 8.3 million. (The Master Plan for Water Supply and Sewerage was based on a different variant, which was very close to the actual rate.)

A decade later, when the Calcutta Metropolitan Development Authority was preparing its Perspective Plan and Action Programme (1981), it projected the population of the CMD using a forecasting method based on assumptions about changes in the CMD's share of the state's urban population. However, since this method requires forecasts of the state's urban population and of the movement in the CMD's share, both of which can be influenced by population distribution policies, it might have been premature to use these parameters as projection

variables in the absence of an urbanization strategy for the state. In addition, the CMDA estimated the population of the 15 cities in the CMD with populations of more than 100,000, since data from the 1981 census were not yet available. When these estimates later were compared with the provisional census figures, the aggregate population of the 15 cities was close to the census totals. However, there were large discrepancies in the case of individual cities, for example, the population of Barrackpore was overestimated by 27 per cent, Chandannagar by 19 per cent and South Dum Dum by 11 per cent, and that of Serampore was underestimated by nearly 12 per cent.

For the long term, the CMDA has projected a population of 14.7 million for the CMD by the year 2001 (a projection that assumes that the contribution of migration will be progressively reduced) and an increase from 15 to 25 in the number of cities with populations of more than 100,000.

State and CMDA planners have acknowledged that there are severe data gaps for urban areas of West Bengal. As a remedial measure, the state government has established an Institute of Local Government and Urban Studies, which is charged with training the staff of local administrative bodies, conducting research on the management of urban affairs and building up an urban data bank.

II. THE ECONOMY

A. Historical background and development of Calcutta's economic base

Established by the British East India Company in 1690 as a trading outpost, Calcutta consisted of a number of small settlements on the west bank of the River Hooghly, which at that time was the main channel of the Ganges on its way to the sea. As the first centre of British investment in eastern India (without a rival in the region even today) and political capital of India until 1912, Calcutta got a head start on the rest of the country in the industrialization process. The first jute mills were set up in the area of the present CMD in the 1870s, paper mills in the 1870s and 1880s, and chemical and pharmaceutical plants in the 1890s. Various engineering activities were established in Howrah in the 1870s, and coal and iron mines in Calcutta's hinterland in the 1860s and 1870s. By the time of the census of 1921, 35 per cent of all industrial workers in India were located in Bengal, compared with 25 per cent in Bombay State.

Following partition in 1947 Calcutta underwent a series of major economic set-backs, beginning with the loss of part of its natural hinterland (which became East Pakistan). Manufacturing did not diversify and continued to be concentrated in traditional industries that were stagnating or in decline (e.g., according to the 1951 census about 50 per cent of all registered manufacturing jobs in the CMD were in the jute industry). Whereas the Calcutta port was the premier port in India until the mid-1960s, it steadily declined because of several factors: a loss in draught due to silting (in 1938 ships requiring a 26-ft draught could visit Calcutta 291 days a year; in 1978 they could visit only 41 days), chronic excess capacity, low productivity, competition from other ports, and the growing preference of exporters in Calcutta's hinterland for the port of Bombay.

In the mid-1960s Calcutta was hard hit by a deep recession. During the Indo-Pakistani conflict at that time, foreign aid was suspended, and the Government of India cut back on orders for engineering goods. This greatly hurt West Bengal, which had the main concentration of engineering industries in India. After 1966 factory employment in West Bengal fell steadily, particularly in the engineering industries. The intensity of Calcutta's economic set-back was due in part to secondary effects of the decline in industrial output, for example, the increased activity of Calcutta's labour unions, the disruption of production in factories otherwise unaffected by the recession, and the rise to power of a new coalition in the state government, which made the investment climate for the private sector somewhat uncertain (Lubell, 1974).

In 1977 the Government of India introduced a new industrial policy to strengthen the promotion of small and cottage industries in rural areas and small towns. This was coupled with an attempt to curb industrial growth in large metropolitan areas. A ban was issued on new licences for large-scale industrial units located within the boundaries of all metropolitan cities with populations larger than 1 million and all municipal cities with populations larger than 500,000. In West Bengal the ban applied to Calcutta and Howrah. The only exceptions to this ban were "sick" industrial units, where diversification was necessary for survival, and the expansion of uneconomic units that would otherwise become "sick". ^{3/} Although these exceptions created a grey area where state governments might be able to obtain exemptions, the ban is currently almost wholly effective.

Finally, the Government of India has unintentionally inhibited the development of Calcutta's industrial economy by means of a policy of nation-wide price equalization for steel and coal, which absorbs freight costs for distant consumers and thus deprives West Bengal (and the eastern region in general) of its locational advantage of proximity to coal and steel centres. This policy was rationalized in terms of "balanced regional development" and the developed character of the Calcutta metropolitan region. However, the main beneficiaries of the policy have not been the backward states of India but other developed states.

B. Recent performance of the economy

Although Calcutta had recovered by the late 1950s from the loss of part of its natural hinterland by partition, it has more recently been plagued with many problems: severe power shortages, raw material limitations, shortage of capital, a reputation for labour troubles, and chronic excess capacity. The agricultural sector produces mainly for the internal market. The industrial structure is weak and still dominated by traditional industries (e.g., textiles, heavy engineering, jute, rubber and paper), many of them so "sick" that they have had to be taken over by the government of West Bengal. Indeed, Calcutta currently has more than 100 "sick" large-scale industries, representing about half of the large "sick" units in the country, as well as some 7,000 "sick" small-scale units, representing about one third of the country's total.

^{3/} The term "sick" is the official term employed by the Department of Industrial Reconstruction of the Government of West Bengal (formerly known as the Closed and Sick Industries Department) to describe unproductive industries that are in danger of closing down.

No major new industries have come into Calcutta in recent years, and the government of West Bengal has reconciled itself to the view that the CMD's industrial growth depends on the rehabilitation of existing industries, the diversification of existing plants into new product lines, and the expansion of small-scale industry, especially outside the core area. As Calcutta's planners have repeatedly emphasized, the prospects for industrial revival are made very difficult by the national policies mentioned earlier, namely, the industrial location controls in large cities and the price equalization schemes (CMDA, 1981e).

C. Spatial structure of the metropolitan region

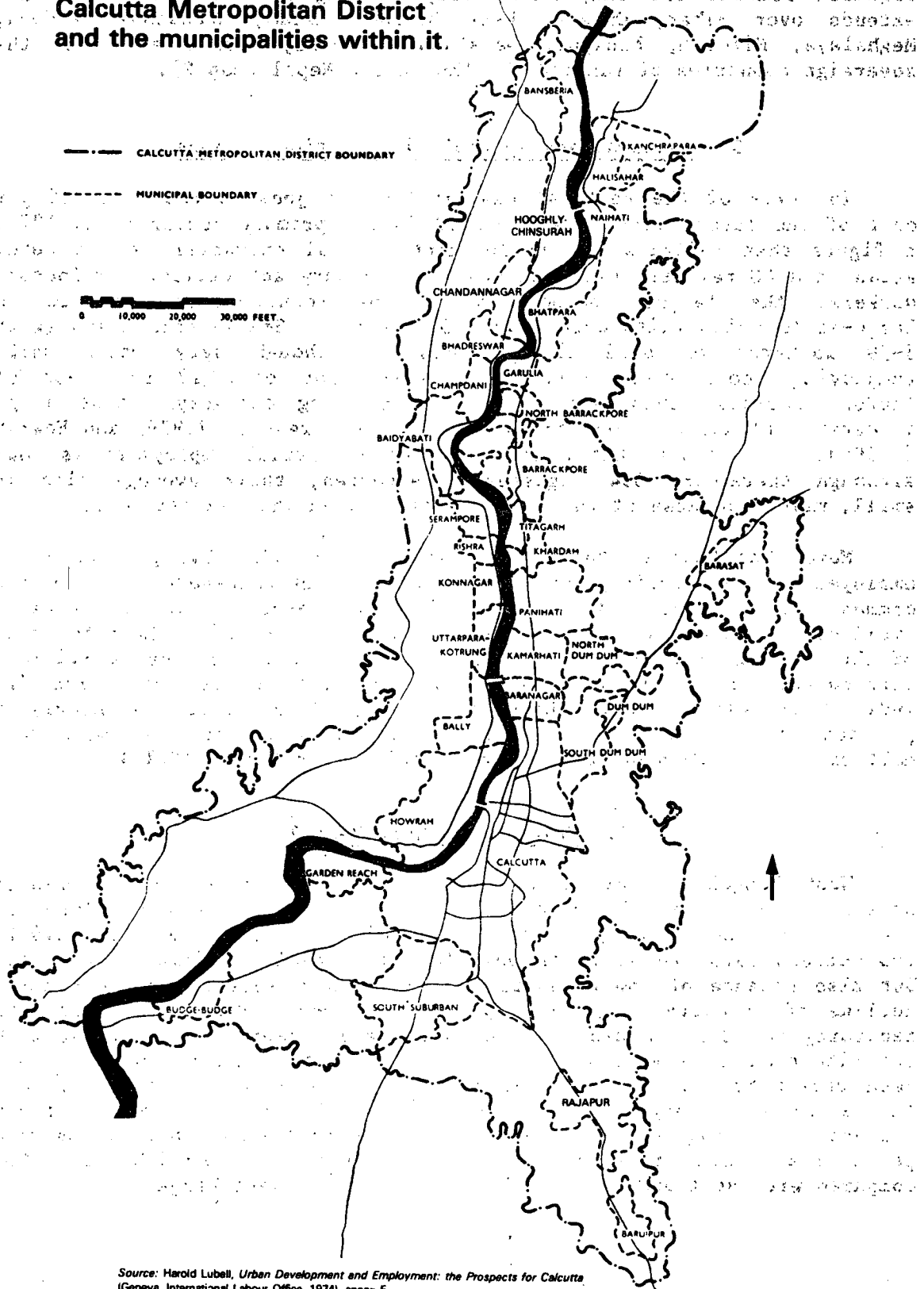
The Calcutta Metropolitan District, an area of 1,450 square kilometres that extends along both banks of the River Hooghly, consists of three corporations (Calcutta, Chandannagar, and Howrah), 34 municipalities, 2 notified areas and 62 non-municipal urban areas, as well as 153 rural villages and outlying rural areas (map 1).

The spatial structure of the CMD is largely a function of its topography. Over the centuries, the level of the river banks was raised high by silt carried down river, creating natural levees, while low-lying areas away from the river remained swamps and marshes. Owing to these constraints, physical growth occurred in a north-south direction along the river (from Calcutta to Kalyani on the east bank and from Howrah to Tribeni on the west bank), with settlement extending only for two-to-three miles in an east-west direction. The major exceptions are the cities of Calcutta and Howrah, where growth has extended over a wider area.

As a consequence of the linear spatial structure and the relatively small number of river crossings, the settlement pattern has been characterized by the development of a number of small, compact and relatively self-sufficient subcentres on both sides of the river around a highly dense urban core (Calcutta and Howrah). The average density in Calcutta Corporation was more than 30,000 persons per square kilometre in 1971, but densities are more than four times higher in several wards. At the outer fringes of the CMD there are 477 rural villages, 306 of which are on the east bank and 171 on the west. Indeed, almost half of the total land area in the CMD (676 sq km) is still classified as rural, although urban development has steadily encroached on agricultural land and the protective green belt has eroded.

The CMD forms one corner of an emerging pentagon of urban-industrial complexes, the other four corners of which are the Asanol mining complex, the Durgapur industrial complex, the Haldia port city complex, and the Siliguri urban complex. Beyond this area,

Map 1.
Calcutta Metropolitan District
and the municipalities within it.



Source: Harold Lubell, *Urban Development and Employment: the Prospects for Calcutta* (Geneva, International Labour Office, 1974), annex E.

Calcutta remains the only major city serving a vast hinterland that extends over Bihar, Orissa, West Bengal, Assam, Arunachal Pradesh, Meghalaya, Mizoram, Manipur, Nagaland, Tripura, Sikkim and even the sovereign countries of Bangladesh, Bhutan and Nepal (map 2).

D. Sectoral and spatial distribution of jobs

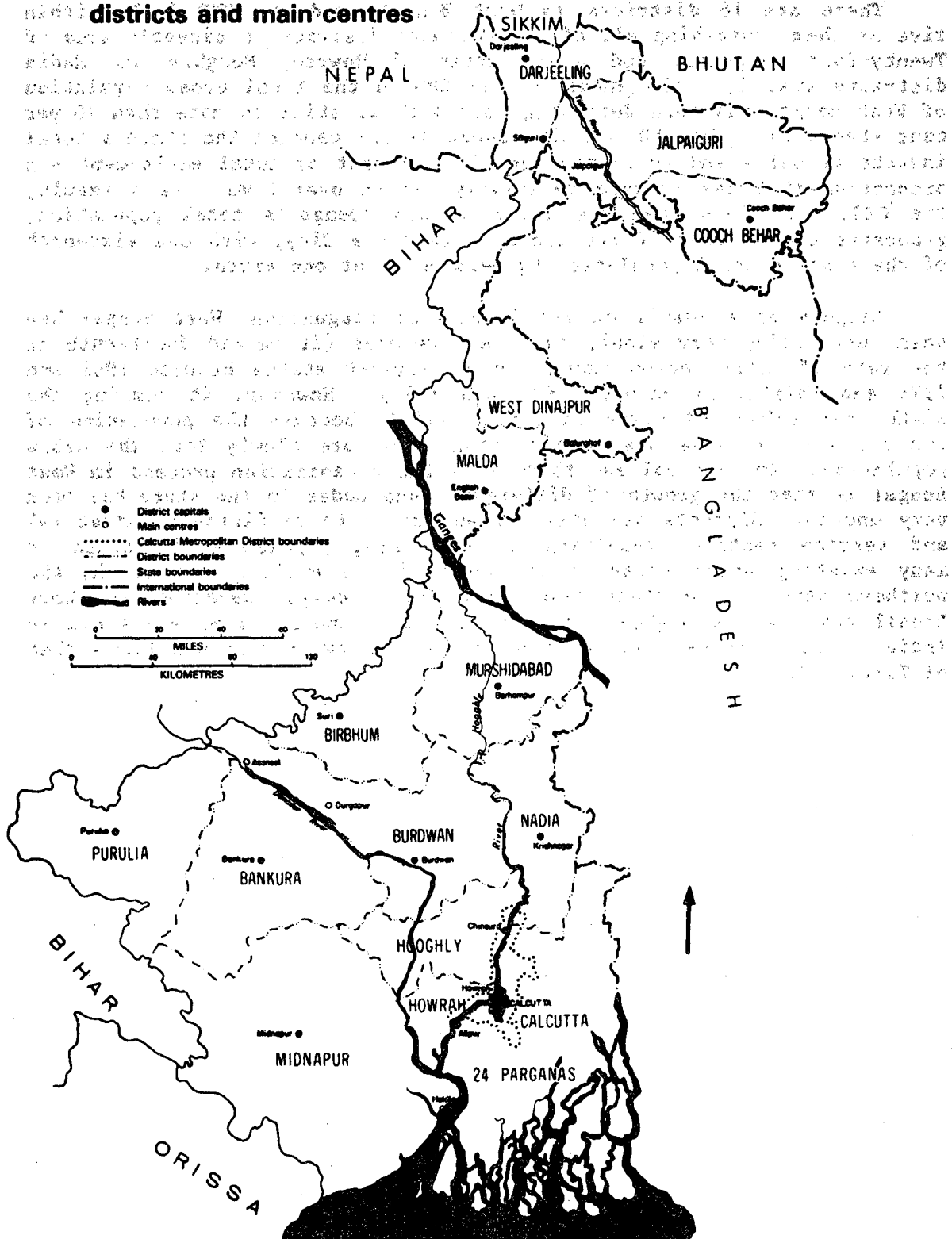
In terms of the sectoral distribution of jobs in the CMD, 5.6 per cent of the labour force was employed in the primary sector as of 1971, a figure that reflects the predominantly rural character of the outer areas, and 40 per cent was employed in secondary activities. Of factory workers, the largest proportion (38 per cent) were employed in large-scale units (with more than 500 workers). Small-scale units (with 5-99 workers) employed 28 per cent. Although very small units (employing one-to-four workers) accounted for only 13 per cent of factory workers, this was the fastest-growing category. Most large industrial plants are located in Twenty-four Parganas (2,979) and Howrah (1,394). In Calcutta City, the level of industrial employment is low; although there are 594 registered factories, their average size is small, mainly because of the scarcity of land in the central core.

More than half of the labour force in the CMD (53.8 per cent) was employed in the tertiary sector - one fifth in transport, storage and communications, two fifths in trade and commerce (mainly retail, small-scale trade), and two fifths in services. A major characteristic of the tertiary sector is the importance of informal sector activities, particularly in trade and commerce. Informal sector activities (in India, often classified as those without a roof) accounted for nearly 80 per cent of the city's 59,220 commercial units and provided more than half of total employment in the commercial sector (CMDA, 1981e).

E. Calcutta in West Bengal

West Bengal is currently one of the most economically depressed states in India, mainly because of its industrial stagnation (whereas the index of industrial production for India as a whole rose from 119 to 193 between 1965 and 1977, in West Bengal it declined from 113 to 101), but also because of low productivity in the agricultural sector and the decline of Calcutta as a major port. Real per capita income has been declining (by 0.3 per cent per annum in recent years), in contrast with the situation in a more dynamic state such as Maharashtra, where it has been rising by about 1 per cent per annum. However, per capita income levels in West Bengal are higher than in India as a whole, mainly because of the higher income levels of the Calcutta metropolis. Average per capita income in Calcutta (at current prices) was Rs 3,300 in 1980, compared with Rs 1,900 in the CMD and Rs 1,200 in West Bengal.

Map 2.
West Bengal:
districts and main centres



Source: Harold Lubell, *Urban Development and Employment: the Prospects for Calcutta* (Geneva, International Labour Office, 1974), annex E.
The boundaries shown on this map do not imply official endorsement or acceptance by the United Nations.

There are 16 districts in West Bengal, and the CMD falls within five of them, absorbing all of the Calcutta district, a sizeable area of Twenty-four Parganas, and small areas of Howrah, Hooghly and Nadia districts (map 2). The share of the CMD in the total urban population of West Bengal has been declining, although it still is more than 70 per cent (table 3). The CMD contains about 82 per cent of the state's total industrial units and generates some 88 per cent of total employment - a proportion that has changed relatively little over time. As a result, the CMD, with less than one fifth of West Bengal's total population, generates one quarter of its income. Calcutta City, with one sixteenth of the state's total population, generates about one sixth.

Largely as a result of its industrial stagnation, West Bengal has been urbanizing very slowly in recent decades (it ranked fourteenth in the rate of urbanization among the 15 largest states between 1961 and 1971 and thirteenth between 1971 and 1981). However, it remains the sixth most urbanized state in India, mainly because the population of the state as a whole has been growing even more slowly than the urban population. Another salient feature of the urbanization process in West Bengal is that the growth of different urban nodes in the state has been very uneven. Migrants are still drawn mainly to traditional industrial and service centres, resulting in increasing population densities in many existing urban areas, while most of the smaller centres in the northern part of the state have grown more slowly. Nevertheless, West Bengal now has the highest density of urban population of any state in India - nearly twice that of Maharashtra and two-and-a-half times that of Tamil Nadu.

Table 3. Urbanization in West Bengal, 1961-1981

	1961	1971	1981
Total population	34930000	44310000	54580000
Urban population	8540000	10970000	14450000
Urban population as a percentage of total population	24.5	24.8	26.5
Population of Calcutta Urban Agglomeration (CUA)	5570000 ^{a/}	7030000	9190000
Population of CUA as a percentage of urban population	65.2 ^{a/}	64.1	63.6
Population of Calcutta Metropolitan District (CMD)	6720000	8330000	10300000
Population of CMD as a percentage of urban population	78.7	75.9	71.3
Density (per sq km)	399	504	615

Sources: West Bengal, Economic Review, 1978-1979: Statistical Appendix; Census of India 1981: Final Population Totals (Delhi, Controller of Publications, 1982).

^{a/} Figures are not comparable because of administrative boundary changes.

III. DECENTRALIZATION AND LOCATION

A. The evolution of spatial strategies

The Government of India's overall spatial policies have evolved in a piecemeal fashion over the past three decades. Those policies include a system of industrial licensing designed to promote balanced regional development; direct investment in government-owned enterprises, with preference being given to small towns and cities and rural areas at the expense of the largest cities; policies to equalize delivery prices of such basic products as cement, steel and coal among regions; the promotion of small-scale industries, particularly in small towns and rural areas; and the establishment of industrial estates as a means of dispersing industry from metropolitan areas to small towns and rural areas. Since about 1970 the Government has placed a great deal of emphasis on developing the country's backward districts. Most recently, the draft Sixth Plan (1980-1985) emphasized the need to promote small towns and medium-sized cities and called for a moratorium to be placed on investment in the very large cities. Whereas some of the above policies and measures adopted over the past three decades have been successful in dispersing industry from the largest metropolitan areas, their impact on reducing the population growth of the largest Indian cities, including Calcutta, has been less than their possible damage to economic growth.

Planning for the development of metropolitan Calcutta began in the early 1960s, following the establishment of the Calcutta Metropolitan Planning Organization, which published a Basic Development Plan for the period 1966-1986. The spatial strategy recommended in the Plan was a bipolar metropolitan structure, with Kalyani-Bansberia in the north of the CMD being promoted as a counter-magnet to the Calcutta-Howrah core. The rationale for promoting Kalyani was that it was located at a sufficient distance from the core to discourage daily commuting. Although its population was less than 5,000 in 1961, Kalyani had a good supply of ground water and high-level infrastructure already in place that could support a larger population. Moreover, with the construction of a new bridge across the River Hooghly that would link Kalyani to Bansberia (pop. 45,500 in 1961) on the west bank and the completion of proposed sections of the national highway that would link the area to the Calcutta-Howrah core, planners were confident that Kalyani-Bansberia could easily accommodate a population of 1.5 million inhabitants, at a much lower cost per capita than in scattered urban centres or the congested urban core.

In spite of substantial investments in infrastructure in the years that followed, Kalyani-Bansberia failed to develop and to function as a counter-magnet. By 1981 Kalyani had a population of only 38,000 and

Bansberia of 89,000. There were several reasons why Kalyani never "took off" on the required scale: neither the proposed bridge nor the connecting highway links were ever constructed; standards in Kalyani were too high and housing was too expensive to attract lower-income groups; and there were insufficient incentives to draw middle-income families (CMDA, 1982b). However, the main reason was that a bipolar approach was later realized to be unsustainable in practice, since no second centre could compete effectively with the original central business district (CBD) and the central core.

The Development Perspective and Investment Plan of 1976 recognized this fact, and the bipolar strategy was formally abandoned in favour of a "multicentric" or "polynodal" strategy aimed at achieving a more balanced spatial distribution of population and the desired dispersal of economic and employment opportunities within the CMD. In brief, the Plan aimed at dispersing economic activity and employment within the CMD by developing 26 partially self-contained urban centres based on community groupings of 60,000 people, which would be linked to each other by a network of linear transportation corridors. The centres were divided into two main categories: business centres and district centres. The former consisted of four sets of twin centres (in addition to Calcutta-Howrah) in the range of 50,000-100,000 people, which would be linked by river crossings in order to create stronger linkages between the east and west banks and thereby counteract the dominant north-south axes. The latter consisted of civic centres in the 300,000-500,000 range that would be located at major transportation and communication nodes.

B. Current spatial strategies

Although a multicentric spatial structure is still being pursued, the Calcutta Metropolitan Development Authority fundamentally revised its spatial strategy in 1981, only five years after the Development Perspective and Investment Plan was drafted. One of the main reasons for revising the strategy was that the Plan concentrated on developing pairs of growth centres around the central core, disregarding spontaneous growth in other parts of the CMD. Moreover, planners subsequently concluded that the number of centres (26) had been arbitrarily chosen and was probably too large (and therefore the scheme would be too expensive). Finally, the rationale for deciding on individual centres, their expected functions and future size had not been explained sufficiently (CMDA, 1982b).

In drafting the Perspective Plan and Action Programme (1981) - which, the CMDA acknowledged, was essentially a physical plan, within which economic plans eventually would be drawn up - the CMDA prepared a

series of alternative structure plans that were submitted for public comment. The structure plans were based on three alternative scenarios for the future growth and distribution of population within the CMD: continuing concentration of population and economic activity in the Calcutta-Howrah core; a decline in the importance of the central core, which would be eclipsed by the north-west portions of the CMD (where development would be stimulated by the growth of new activities such as the Haldia port city complex in the south-west); and balanced development, with dynamic growth in both the CMD and the north-west area. Having determined that at least 15 (and not more than, but probably not as many as, 25) third- and fourth-order centres should be developed to promote the efficient decentralization of activities, planners then selected the individual centres that would most likely be developed under each of the three scenarios. The alternative structure plans were then evaluated (and assigned numerical scores) on the basis of the degree of decentralization likely to be achieved, the availability of vacant land, the past growth performance and employment potential of individual centres, and the cost of infrastructure investments implied by the respective strategies.

On the basis of the numerical scores, the preferred structure plan was the one that assumed that growth would occur both around the Calcutta-Howrah core and in the north-west portion of the CMD. The plan recommended that some functions of Calcutta and Howrah be transferred to an additional 17 centres (7 third-order centres, 5 on the east bank and 2 on the west; and 10 fourth-order centres, 5 on each bank). The underlying idea was that these centres would provide a level of services sufficiently high to reduce the daily flow of 1.2 million commuters. This would relieve congestion in the central core, prevent the further deterioration of the city's overburdened infrastructure, reduce environmental pollution, and ultimately lead to the more rational use of land.

Implementation has proceeded slowly. Since CMDA is not an economic planning agency but primarily a public works agency, it has not developed explicit policies to induce metropolitan decentralization. The most clear-cut action it has taken to achieve a more balanced spatial distribution has been to shift the pattern of its investment away from primary infrastructure towards integrated area upgrading and new area development programmes. Although the CMDA intends to extend the New Area Development Programme substantially, action at present is limited to Salt Lake, East Calcutta, West Howrah and Baishnavghata-Patuli, each of which will be briefly discussed.

Salt Lake. A middle-class suburb, Salt Lake began to be developed during the 1970s and had a population of 35,770 in 1981. Although it was planned as the site of a major government complex that would bring

together central and state government agencies from all over the city, only a few government offices (including research branches of the CMDA) have been relocated there.

East Calcutta. Located west of the eastern metropolitan bypass, a 426-acre marshland site for East Calcutta township is being filled in (and raised 1 metre) to accommodate 40,000 persons. The CMDA will provide basic services (water, drainage, a primary and a secondary school and a health clinic) and some employment assistance (for fish cultivation in artificial ponds created during the landfill process, and for cattle raising, tanning and small-scale industry). There are plans to develop part of the area for higher-income groups so that profits might be used to cross-subsidize housing for lower income families.

West Howrah. Located 13 kilometres from the central business district on vacant marshland on the outskirts of Howrah, a 455-acre site is being filled in and developed for a target population of 50,000. The project will provide about 7,500 plots with a sanitary core for lower-income families, 1,000 rental units, and basic social infrastructure (e.g., primary and secondary schools and a health clinic). In addition, a 144-acre site will be developed as an industrial estate and for other economic activities such as fish-farming. In the same general area, the CMDA is developing the Kona Truck Terminal and Wholesale Trading Centre, which will provide facilities for wholesale trade, offices and some residential and community facilities.

Baishnavghata-Patuli. Located 15 kilometres south-east of the central business district, an area of 376 acres is being developed with industrial and residential sites, basic services and community facilities to serve a projected population of 40,000.

Eventually, 22 such townships are planned, many with special working facilities for groups such as washermen, tanners and milkmen, who will be given household plots with a sanitary core, water and electricity points, as well as working space (e.g., washing ponds, tanning and curing facilities, cattle sheds). The CMDA has also completed redevelopment of the Howrah Fish and Pan market, an area near the Howrah Railway Station that had previously grown chaotically. The project mainly involved the construction of workers' dormitories, offices and market stalls.

IV. ISSUES AND SECTORS

A. The labour market

Employment in the CMD has increased very slowly because the industrial decline has been offset by the selective expansion of the service sector, even though the largest source of service employment - the port of Calcutta - has severely contracted its labour force. The decline in industrial employment has been steady, even though the government of West Bengal has made a major effort to save jobs by taking over large "sick" industries. Between 1973 and 1981 it took over 47 large-scale industries, saving a total of 26,900 jobs. However, during each year of that period many times that number of jobs were lost owing to closures, lock-outs and other industrial disputes. For example, in 1979, the most recent year for which information is available, there were 145 strikes and 151 lock-outs, involving nearly 450,000 workers and the loss of 19 million work-days.

Of course, the most important source of employment is the informal sector. Relatively little attention has been given to this segment of the labour force. However, since 1981 an employment programme has been developed in conjunction with the CMDA's bustee (slum) improvement programme, as planners begin to acknowledge that raising incomes and providing employment are central to any effective slum-upgrading programme. The CMDA formulated preliminary plans to give bustee dwellers more economic support in the form of working capital, working space, facilities for procuring raw materials, and marketing assistance. As a first step, special working facilities were provided for small homogeneous groups of workers in individual slums (e.g., for tailors in one slum, clay modellers in another, woodworkers in another). In addition, work was begun on identifying candidates and extending loans to small traders and manufacturers (with the assistance of five commercial banks and the Small and Cottage Industries Department of the Government of West Bengal. Progress to date, however, has been slow; as of 1983 a total of 315 loan applications had been received and, of these, 222 loans approved.

According to the CMDA's projections, there will be 1.9 million new entrants into the labour force between 1981 and 2001. Of this number, an estimated 600,000 will need to be provided with industrial jobs. Emphasizing the improbability of providing 600,000 jobs in small-scale and medium-scale industry, the CMDA has strongly urged the Government of India to consider a relaxation of its blanket ban on heavy industry in metropolitan cities (CMDA, 1981e). It noted that the establishment of 15 new large-scale industries could create some 30,000 new jobs. The construction of 100 new industrial estates for small and medium industry might create an additional 70,000 jobs (assuming 20 establishments per

industrial estate, with 35 workers per establishment). Finally, the expansion of existing large-scale engineering and electrical engineering firms and the utilization of excess capacity might provide an additional 100,000 jobs.

B. Urban land

Calcutta has a shortage of vacant land, which has led to rising prices and slowed the acquisition of land for public purposes. It is paradoxical that while the CMDA has been filling in marshland in peripheral areas for new area development schemes (e.g., in East Calcutta), land is used very inefficiently even in the inner city, where low shacks spread behind narrow rows of two- or three-storey houses. (The floor/area ratio, (i.e., total area of floor space divided by the area of the site) is 1 or less in Calcutta, compared with 4 in Bombay.)

The issue of land ownership is particularly relevant to the situation of Calcutta's slums. In contrast with other large Indian cities, where slums are located mainly on public land, Calcutta's slums are located mainly on private land. Calcutta's unique three-tiered system of land ownership, hut ownership and tenancy can be traced to an early period, when groups of middlemen (known as thika tenants) leased parcels of land from the feudal lords and constructed low-rise high-density housing, which they then rented out to tenants, using part of the rent to compensate the landlord.

Although thika tenants have enjoyed legal protection and security of tenure since 1935, the system as a whole has served as a disincentive to bustee improvement. Landlords have usually been unwilling to sell their land because of its extremely low return. The thika tenants, who usually are not affluent and may live in the bustees themselves, have no incentive to make improvements because of rent controls that make such investments unprofitable, while the occupants, since they are not owners and usually have very low incomes, likewise have little incentive or capacity to make improvements.

In 1971 the West Bengal Slum Area Improvement and Clearance Act empowered the state government to acquire users' rights required for improvement of the bustees. A major piece of legislation was the West Bengal Thika Tenancy Act (1981), which aimed at abolishing the system by vesting all bustee land in the state. Under the Act, after acquiring the land, the state government is empowered to collect revenue from the thika tenants in order to maintain basic services.

C. Housing

A basic feature of the housing situation in the CMD is the large proportion of the population living in squatter and slum conditions. The primary reason for this situation is the lack of effective demand, and underlying the lack of demand are the low incomes of the great majority of households, preventing them from affording the economic rent for new pucca housing (i.e., housing made of brick, stone, concrete or timber - as opposed to kutchha housing, made of bamboo, mud, grass, leaves or thatch).

Currently, about one third of the CMD's population (2.6 million out of 8.3 million inhabitants) live in overcrowded settlements of single-storey huts of temporary construction, which are shared by an average of five families. These settlements are of three types: statutory bustees, squatter settlements and refugee colonies. Squatter settlements differ from statutory bustees in that they are unregistered slums, usually built in fringe areas on public land. Refugee colonies, which were established to house refugees from East Bengal after partition, are mainly located on government land.

The first bustees were located near the port or close to factory sites and provided accommodation for workers (usually recent unattached migrants from the countryside). (The long-standing presence of a relatively large proportion of single males in Calcutta, many of whom have left their families behind in the villages and who therefore voluntarily withhold significant portions of their earnings from local consumption, has created special conditions in the housing market.)

More bustees subsequently developed to provide accommodation for other low-income segments of the population. Currently, bustees are located in 97 of the CMD's 100 municipal wards. There are some 3,000 bustees in the CMD, which accommodate 2.6 million persons, half of them in Calcutta City.

Beginning in the 1930s, efforts were made by the Calcutta Corporation to improve living conditions in the bustees through the bustee landlords. The Calcutta Slum Clearance and Rehabilitation of Slum Dwellers Act (1958) envisaged the gradual clearance of the bustees and the relocation of bustee dwellers. This strategy was soon realized to be impracticable because of the prohibitive cost of clearance programmes, resistance from the highly organized bustee owners, and numerous legal problems relating to the three-tiered system of land ownership (see sect. B above).

With the gradual realization of the infeasibility of bustee clearance programmes, there was a shift in emphasis from bustee clearance to bustee improvement. Since 1970 the CMDA, with financial

assistance in the form of special grants from the Government of India, has focused on four basic physical improvements in individual bustees: construction of a paved internal road; provision of electricity on internal roads; improvement of the supply of potable water (through the construction of 1 tap per 100 persons); and conversion of privies into sanitary latrines.

Some 1,500 slum units - half of the CMD's slums - were covered in the first phase of the CMDA's bustee improvement programme, and the remaining units will be covered in a second phase. To date, the CMDA estimates that 1.7 million persons have benefited from these improvements.

With respect to more conventional housing, a number of agencies, including the Housing Board, the Calcutta Improvement Trust, the Howrah Improvement Trust and the Housing Directorate, are working to improve the housing situation in Calcutta. However, while it is estimated that 42,600 units per annum are required merely to deal with additional growth (and would not have any impact on reducing the deficit), average annual production has been only about 15,000 units in recent years.

The current thrust of programmes in the housing sector is to provide housing to Calcutta residents within their ability to pay. However, low incomes necessitate cross-subsidization, that is, constructing a certain amount of conventional housing for middle- and high-income households from which sale proceeds are used to subsidize group housing for the poorest households and to develop land for sites and services. For lower-income families (except the very poorest families), the idea is to provide them with small serviced plots with a sanitary core and to encourage self-help housing by extending suitable credit facilities.

D. Water supply and environmental problems

Calcutta's high incidence of cholera - mainly attributed to its unfiltered water supply - was what first attracted national and international attention to the serious deficiencies in the city's infrastructure. Following the chlorination of the city's water supply, which dramatically reduced the incidence of cholera, the Calcutta Metropolitan Planning Organization, in collaboration with the World Health Organization, produced a Master Plan for Water Supply and Sewerage. The Plan divided the CMD into five service districts, each to be provided with its own centralized system of collection, treatment and supply. Owing to financial constraints, the implementation of the Plan was considerably delayed. When the CMDA came into existence in 1970, it proposed a somewhat less extensive water supply programme, reducing the

number of service districts from five to three, lowering targets for per capita consumption, and placing major emphasis on the replacement of century-old pumps and pipelines and the construction of boosting stations and waterworks in under-serviced areas. As a result of such measures, which have absorbed the largest proportion of CMDA expenditure, Calcutta's water supply has increased from 80 million to 140 million gallons daily. Moreover, distribution has somewhat improved as a result of the CMDA's emphasis on the construction of more than 20,000 stand-pipes in the bustees. In fact, access to water in Calcutta is now better than in most large Indian cities.

With the construction of large new sewerage treatment plants in Howrah and Serampore and the implementation of some 40 other sewerage projects, sewerage has improved to the point that one half of the population now has access (up from one third). Drainage has long been one of the city's most serious infrastructure problems (because the land slopes away from the river, there is no natural drainage and an elaborate pumping system must be used). The CMDA has implemented more than 70 drainage and outfall improvement schemes in recent years.

With respect to environmental sanitation, the CMDA has implemented a programme of solid waste management to deal with the daily accumulation of 2,500 tons of solid waste (much of it ash from domestic ovens) and converted more than 50,000 privies into service latrines. One of its major environmental projects is a cattle resettlement project, which aims at moving many of the city's 2,200 unhygienic khatalas (cattle sheds) to cattle colonies on the city's outer fringes. This project, which is being implemented in conjunction with new area development schemes, has the additional objective of improving the city's dairy industry.

E. Power

Power shortages remain one of Calcutta's most serious problems. The region as a whole had an average power deficit of more than 30 per cent in recent years, compared with a national average deficit of about 8 per cent. The government estimates that the daily supply in West Bengal in 1983/84 was 869 megawatts; the estimated peak demand was 1,438 megawatts. As a result, in recent years there have been almost daily power interruptions that have been a major constraint on industrial performance. Although the government of West Bengal has announced the construction or expansion of 10 power stations in the state by 1990 (which would increase installed capacity by 2,230 MW), many of these projects depend on funding decisions by the central Government and are uncertain.

F. Health and education

Whereas Calcutta was once considered the "cholera capital of the world", with more than 1,000 cholera deaths a year, the incidence of cholera has been significantly reduced by chlorination of the water supply. General mortality remains high, however, with respiratory and diarrhoeal diseases constituting the major causes of death.

The city's health care network remains primarily a hospital-based curative system. In 1971 Calcutta had 135 hospitals (with 16,000 beds), 156 dispensaries and 186 clinics (the number of hospital beds per 1,000 population was 1.9 for the CMD as a whole and 2.1 in the urban areas). However, these facilities were very unevenly distributed, with a higher concentration on the east bank and in middle-income areas such as Salt Lake. In recent years, the CMDA's programme has emphasized the construction of dispensaries and mobile polyclinics in areas where no facilities were available. However, only 19 out of 37 hospital construction schemes were completed during the fourth plan period, when the programme had to be discontinued because of financial constraints. Subsequently, the Government of the Netherlands provided financial assistance to complete some of the projects.

Family planning services, which were once opposed but are now cautiously supported by the Left Front government of West Bengal, are provided under the aegis of the Calcutta branch of the Family Planning Association of India (FPAI), an affiliate of the International Planned Parenthood Federation. As in all Indian states, the government of West Bengal sets targets for such voluntary organizations and delineates their areas of activity. Since the inception of the FPAI's Calcutta project in 1972, the Association has operated a number of mobile education cum service units that provide services to the population of bustee areas, as well as static clinics and a comprehensive model family planning clinic. In 1983 the Calcutta project provided services to 43 per cent of the 111,970 eligible couples within its area, representing a 3 per cent improvement over 1982. New acceptors accounted for 83 per cent of the condom target and 112.8 per cent of the target for intra-uterine devices (IUDs); in addition, there were 1,502 tubectomy acceptors, compared with 1,206 in 1982 (People, 1984).

Calcutta has long been one of the major centres of learning in all of India. The city has 49 colleges, 95 secondary schools, 403 middle schools and 2,111 primary schools, although these are unevenly distributed. In recent years the CMDA has constructed 100 new primary schools and renovated 600 others. However, because the number and capacity of schools in Calcutta remain insufficient to deal with total school-age enrolment, many schools have moved to a double-shift system.

G. Transport

A basic determinant of transport routes and movement patterns is the River Hooghly, which bisects the CMD. The difficulty and cost of providing adequate river crossings (there are only three bridges and limited ferry services over an 85 km length of river) have led to the emergence of highly independent activity patterns and transport systems on the east and west banks (and contributed to the development of a spatial pattern involving a number of small, compact and relatively self-sufficient subcentres around a high-density urban core.)

Owing to Calcutta's extremely high population density and limited surface roads (only 43 roads are accessible to public conveyances), perhaps nowhere else in India is traffic more chaotic and slower moving. Transport planning is hampered not only by the fact that there has been no appreciable change in the city's road network for the last century but also by the lack of vacant land (the CMDA estimates that roads account for only 6 per cent of land in Calcutta and 3 per cent in Howrah, compared with 25 per cent in Greater Delhi). In addition, periodic flooding makes large sections of the city impassable except to non-motorized vehicles such as rickshaws and cycle rickshaws (which has been one of the major justifications for their continued use).

Besides traffic congestion within the central city, Calcutta faces the problem of severe overcrowding on public vehicles within the city and on trains and buses carrying the daily passenger load of 1.2 million commuters from outlying areas. As of 1980, Calcutta had a fleet of 1,188 state-owned buses (because of maintenance problems, only 631 were on the road at any given time), 1,500 private buses (with an average of 900 in service) and 438 tramcars (with an average of 300 in service). The CMDA estimated that the total capacity of public transport was about 2.8 million, while the daily passenger demand volume was about 6.8 million. In order to cope with the serious deficits in the transport sector, three large-scale transportation infrastructure projects - the Calcutta Metro Railway, the circular railway and the Second Hooghly River Bridge - have been initiated and are at various stages of completion. Since 1972 construction has been under way on the Calcutta Metro Railway, a Government of India project that is the first such project in the country. When completed, the metro will run from Dum Dum to Tullunga, a distance of 16.4 kilometres under the busiest north-south corridor, and will carry 25 per cent of the the daily passenger load. Although the first half-mile of track was scheduled to open in mid-1984, the opening was delayed because of flooding. The completion of the metro is now scheduled for 1990, although planners acknowledge that this target may be optimistic. The delays have resulted in considerable cost overruns; indeed, whereas the original estimate was some \$140 million, construction costs to date have exceeded \$700 million. The second major

project is the long-awaited circular surface railway, for which feasibility studies were conducted as early as 1947. The first line was scheduled to open in late 1984 and the entire line to be in operation by 1989. The third project - completion of the half-constructed Second Hooghly River Bridge - is also targeted for 1989. The first high-level cable suspension bridge in India, the bridge is designed to allow freer movement between Calcutta and Howrah and to provide Calcutta port with a direct link to several national highways.

The CMDA has also widened and redeveloped some 20 major roads and constructed four small bridges and one elevated flyover. In response to recommendations of the World Bank and other international agencies that there should be greater emphasis on cost-effective programmes of traffic management in Calcutta (e.g., construction of pedestrian walkways and cycle lanes; bans on private vehicles in certain localities), the CMDA incorporated these ideas in its implementation of a major traffic engineering project that is scheduled to be completed in 1989.

V. RESOURCES AND MANAGEMENT

A. Public investment

With respect to the CMDA's pattern of public investment, there has been some redistribution in primary infrastructure investments in recent years from water supply and roads to sewerage and drainage and solid waste management. However, the major shift, already reflected in current operations but intended to be reinforced, is the expansion of the Integrated Area Upgrading Programme and the introduction of the New Area Development Programme (table 4). During 1978-1983, water supply and traffic and transportation continued to receive the largest shares of CMDA investment (table 5). Area development and sewerage and drainage ranked third, each receiving 16 per cent of total public investment. Bustee improvement ranked next, followed by solid waste management, municipal and anchal (outlying area) development, technical assistance and environmental hygiene. In the five-year investment programme for the period 1983-1988, proposed investments have been allocated to four subprogrammes. The municipal development programme, which accounts for one third of total projected investment, will deliver basic municipal services, including water supply, sanitation, bustee improvement, and transport infrastructure, to the most deprived areas in each of the municipalities within the CMD. Under the transmunicipal infrastructure programme, which accounts for 14 per cent of total proposed investment, the CMDA will plan and execute critical infrastructure projects in the water supply, drainage, sanitation and transport sectors, the benefits of which are expected to be shared by two or more municipalities. The Calcutta-Howrah investment programme, which has a 30 per cent share of total projected investment, will focus on making the best use of existing infrastructure and continuing projects carried over from the preceding five-year investment programme. Finally, the CMD-wide complementary programme, which has a 14 per cent share of total investment, focuses on shelter and area development, health, the promotion of small-scale businesses, and anchal (outlying area) development, with the aim of expanding programmes begun under the preceding investment programme.

Although Calcutta undoubtedly will continue to receive outside financing, in the form of credits from the World Bank's International Development Association (IDA) and grants from the Government of India, and to raise internal revenue through property taxes, it stands to receive a progressively smaller share of resources from the government of West Bengal. Noting that per capita expenditure has been disproportionately high in Calcutta for many years at the expense of other CMD municipalities and, particularly, of non-CMD municipalities, the Left Front government has announced that it will slow down the growth of expenditure in Calcutta and step up expenditure in other towns, both within and particularly outside the CMD.

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**Table 4. Pattern of investments of the Calcutta Metropolitan
 Development Authority
 (Percentage)**

Investment	Past	Present	Recommended
Primary infrastructure	85	71	55
Water supply	32	23	10
Roads and streets	29	22	10
Sewerage and drainage	20	18	25
Solid waste management	4	8	10
Integrated Area Upgrading Programme	15	22	35
New Area Development Programme	0	7	10
Total	100	100	100

Source: CMDA, "A note on some basic issues relating to the development strategy for future CMDA programme", Report 109 (1980).

Table 5. Sectoral distribution of investments of the Calcutta Metropolitan Development Authority, 1978-1983

	Investment (Rs crores)	Sectoral distribution (percentage)	IDA share (percentage)
Area development	36.30	16.0	42.1
Bustee improvement	24.19	10.7	79.1
Schools	2.46	1.1	87.4
Health	0.20	0.1	100.0
Water supply	48.87	21.5	42.0
Sewerage and drainage	36.20	16.0	59.6
Solid waste management	10.36	4.6	80.7
Environmental hygiene	5.54	2.4	63.9
Traffic and transportation	42.47	18.7	55.5
Technical assistance	8.85	3.9	66.2
Municipal and anchal development	10.02	4.4	79.7
Parks	1.50	0.7	0.0
<u>Subtotal</u>	226.95	100.0	56.5
Design and supervision	28.16	-	34.3
Contingency	22.63	-	100.0
<u>Total</u>	227.74	-	57.8

Source: CMDA, Five Year Investment Plan (1978-9 to 1982-3), Report 103 (1979).

B. Resource generation

Calcutta's resource base is made up of revenue from external and internal sources, the first consisting of direct state transfers in the form of grants or assignments and the second of income from local sources that the state government allows the municipalities to retain. Internal revenue, which in Calcutta's case constitutes about 60 per cent of total revenue, comes mainly from tax revenue, of which the property tax is the most important source.

In recent years, because of poor collection rates and inefficient assessment and reassessment, revenue from property taxes has been growing slowly and has been far outpaced by the rise in both property values and municipal expenditure. Moreover, whereas the property tax is a relatively more important source of revenue in Calcutta than in any of the other metropolitan cities, property-tax collection has gone down in Calcutta in recent years, while it has increased in Bombay, Delhi and Madras.

In addition to the property tax, about 10 per cent of total revenue in Calcutta (although much less in other municipalities) is derived from "other taxes" - mainly taxes on the professions and various trades, with very small amounts from tolls and miscellaneous taxes (on carriages and animals, shows and advertisements). Finally, municipalities generally receive a small amount of non-tax revenue (about 10 per cent of total revenue in the case of Calcutta, 3 per cent in the case of Howrah) from operating commercial services such as markets and slaughterhouses.

Given that internal revenue from all sources has not kept pace with municipal expenditure (during the period 1975-1979, total revenue grew at 9 per cent, compared with a 13 per cent rise in expenditure), the government of West Bengal has been obliged to grant large transfers to close the gap. And, of course, given its extreme need, Calcutta has received large direct grants from the Government of India, as well as IDA credits from the World Bank.

Nevertheless, the total revenue of municipal bodies in West Bengal is much lower than in the other states. In an effort to increase revenues, the government of West Bengal has conducted a number of study missions to observe revenue-collecting mechanisms in other Indian cities and states. Moreover, it has been considering proposals to replace the property-tax base (which is currently the annual rateable value) by alternatives such as capital value, site value or composite bases determined by assigning weights to a number of selected variables (e.g., location, type of building, use of property).

In terms of the CMDA'S finances, the Government of India formerly granted an annual loan of Rs 7.5 crores (later raised to Rs 10.5 crores), which was matched by the government of West Bengal. The CMDA also received 50 per cent of the collections from octroi (a duty imposed on goods entering the state), grants from the central Government as part of the minimum needs programme, and IDA credits (\$35 million in 1973 and \$87 million in 1977), which were offset against the central Government's contribution. Since 1978, when the Government of India discontinued the integrated urban development programme under which its loans were sanctioned, the CMDA has obtained financing from the state government, a share of the octroi duty and market loans (as well as some bilateral assistance, e.g., from the Government of the Netherlands for cattle resettlement and hospital construction).

C. The institutional context

Primarily because of concerns about Calcutta's high levels of morbidity and mortality (particularly from cholera), the Calcutta Metropolitan Planning Organization (CMPO) was established in 1961, at the urging of West Bengal's chief minister and with the assistance of the Ford Foundation and the World Health Organization. The CMPO produced the Basic Development Plan in 1966, as well as master plans for water supply and sewerage and for traffic and transportation. Little action was taken, however, to implement the recommendations of the CMPO, and Calcutta continued to decline.

Calcutta's situation deteriorated to the point that the Government of India decided to intervene in 1970 and, under a presidential act, established the Calcutta Metropolitan Development Authority. In the beginning, the CMDA's role was to channel funds to the 56 implementing agencies operating in the CMD. The Calcutta Metropolitan Development Authority Act, which was passed by the state government in 1972 and amended in 1974, expanded the CMDA's role to include the formulation of structure and land use plans for the CMD, as well as the co-ordination and financing of sectoral projects. Gradually, the CMDA began to take over the responsibilities of other agencies or to use them as sub-contractors, and it evolved into a powerful public works agency and executing agency in five chief areas: water supply; sewerage and drainage; traffic and transportation; bustee improvement (and municipal and outlying area development); and new township area development. The 1979 West Bengal Town and Country Planning and Development Act expanded the role of the CMDA still further, by designating it as the major planning agency for the CMD. Towards this end, a separate planning directorate was established, which published a series of background studies.

By the end of the first decade of its existence, the CMDA was a highly visible institution that was increasingly subjected to public evaluation and review. There were criticisms from state government officials and community leaders that the CMDA had become too autonomous and had been superimposed on the existing structure of local government; that it had paid too much attention to constructing physical infrastructure and insufficient attention to planning and evaluation; that other agencies had been overshadowed and had become progressively weaker; and that too much centralization had made the CMDA less responsive to the needs of the community (Menezes, 1985). In response to these concerns, the state government recently changed the role of the CMDA and other agencies. The CMDA has been given a strong appraisal, monitoring and evaluation unit, and its planning functions have been reorganized and strengthened. Responsibilities for various sectoral projects (e.g., water supply and sewerage) will gradually be transferred to other agencies. Moreover, completed facilities will be transferred to local government bodies for operation and maintenance. In other words, the CMDA's predominantly executive role will be restructured, and its co-ordinating, policy planning, monitoring and evaluation functions will be reinforced (Menezes, 1985).

As for the institutional context as a whole, a number of fundamental changes were instituted by the Left Front government that came to power in West Bengal in 1977. In line with its policy of greater devolution of power to lower levels of government, the government of West Bengal passed the Calcutta Municipal Corporation Act, which provides for a cabinet system of government, with a mayor-in-council, and greatly limits the state government's power to intervene in municipal government. To carry the process of administrative decentralization still further, an expanded role is envisaged for various local bodies, mainly with respect to capital budgeting and setting priorities within broad technical and financial guidelines set out by the CMDA (Menezes, 1985).

CONCLUSION

Although Calcutta remains in economic terms one of the poorest cities in India (indeed, one of the poorest in the world), it has mounted a very large infrastructure and public investment programme and made considerable progress during the past decade in addressing some of the city's most serious infrastructure deficits. This seeming paradox is explained by the partnership of a strong development authority (the CMDA) and massive financial support from IDA. Under the aegis of the CMDA, since 1970 the city's water distribution network has been improved to the point where one half of the population has access to piped water (previously it was one third). The sewerage network has been extended; a number of major environmental sanitation projects, for example, cattle resettlement, are under way; moreover, drainage, which was one of the city's most intractable problems, has been much improved. Several hundred schools, particularly primary schools, have been constructed or rebuilt, and there have been the beginnings of a shift from a curative, hospital-based health care system to a preventive, primary health care approach. Although Calcutta's slums are among the worst in India, major slum improvement efforts involving the construction of paved internal roads, electrification and the provision of water stand-pipes and sanitary latrines have improved living conditions for nearly 1.7 million persons, and efforts are being made to reach an even larger group. Whereas slum improvement efforts were long frustrated by the three-tiered system of land ownership in Calcutta, the Thika Tenancy Act of 1981, which provides for the eventual vesting of slum land in the state, clears the way for more rapid slum improvement.

Apart from the measurable improvements in urban infrastructure, it is too early to evaluate the effects of the CMDA's spatial strategy, which aims at promoting a large number of satellite centres in addition to those of Kalyani and Salt Lake and, more recently, West Howrah and East Calcutta. An undoubted appeal of new area development is that the constraints on development (e.g., problems of public land acquisition, land use conversion and political and institutional obstacles) are much less severe than in the central core. However, there are grounds for moving ahead only cautiously with the New Area Development Programme. Generally, a polycentric pattern of development evolves during conditions of rapid metropolitan growth. Calcutta is growing so slowly that the pressures for subcentring are quite weak. A polycentric structure tends to be most effective when it develops spontaneously, with a modest degree of public sector guidance. If a metropolitan authority attempts to promote subcentres in advance of demand, experience has shown that there is a risk of wasted public investment - a dangerous risk in Calcutta's case because of the scarcity of capital resources.

In a world without resource constraints, there would be some virtue in reducing the high densities of Calcutta's central core. However, a strategy of suburbanization and decentralization may be difficult to justify in current economic conditions. The costs of redeveloping the central areas are too high, and there is little prospect that many households would relocate in the absence of the creation of new jobs and the provision of affordable housing at the proposed new subcentres. Certainly, there are insufficient stimuli from outside Calcutta (i.e., the entry of new firms and the arrival of new migrants) to supply a base for strong subcentre growth. Moreover, rising energy and transportation costs increase the relative efficiency of a very compact metropolitan area compared with a highly decentralized metropolitan region.

Although the CMDA's successes in the public works area, and especially in the provision of primary infrastructure, have generated indirect benefits for the metropolitan population, they have not contributed directly to increasing incomes and purchasing power. This is clearly the major challenge facing Calcutta's planners. Overall, living standards in Calcutta have deteriorated relative to the rest of the country, and this deterioration is intimately tied to the stagnation of the metropolitan economy. Any major improvement in levels of living will require a much higher rate of economic development. Unfortunately, the current economic climate in Calcutta does not favour the achievement of this objective. The industrial base is too narrow, with a substantial weight of "sick" industries, and insufficiently diversified with too few new product lines. The central Government's ban on new large- and medium-scale industries in large cities may abort efforts to attract new firms unless the state is able to obtain exemptions. Power shortages remain a major constraint. Moreover, the reputation of the region for poor industrial relations has discouraged the entry of new labour-intensive firms. In these circumstances, it will not be easy to design a successful economic development strategy.

Decisions on optimal planning strategies for the CMD and the rest of urban West Bengal cannot be sufficiently well informed unless policy makers have a clearer view about the future population size of the CMD, medium- and long-term economic trends in the metropolitan economy, and the future pattern of urbanization in the state. At present, this information required for planning is largely missing. Estimates of future population have been derived from simple projection methods or ratio techniques applied to state-wide projections. Moreover, there has been little study of urbanization in West Bengal. Attempts to integrate economic and physical planning within the CMD and to formulate an urbanization strategy for the state have yet to be made by state and CMDA planners. Without these analyses, planning for the CMD is likely to be, at best, only partially effective.

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