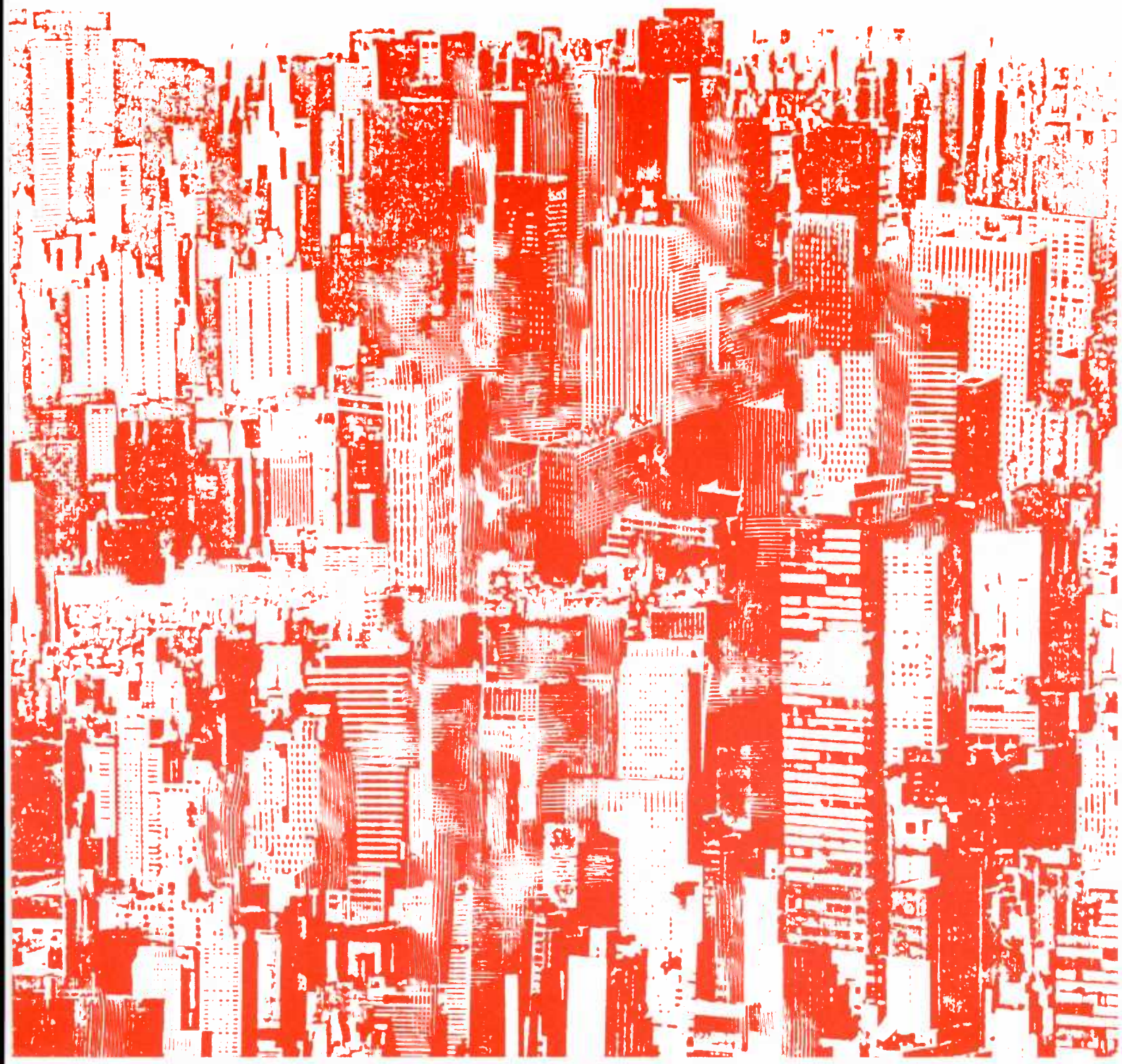
United Nations

Population Growth and Policies in Mega-Cities

BANGKOK



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Department of International Economic and Social Affairs

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Population Growth and Policies in Mega-Cities

BANGKOK

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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 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.

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 Population Growth and Policies in Mega-Cities 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:

BMA	-	Bangkok Metropolitan Area
BMR	-	Bangkok Metropolitan Region
BMTA	-	Bangkok Metropolitan Transit Authority
CBD	-	Central Business District
NESDB	-	National Economic and Social Development Board
NHA	-	National Housing Authority
NSO	-	National Statistical Office

INTRODUCTION

The Bangkok Metropolitan Area, which had a population of more than 5,000,000 inhabitants in mid-1984, is one of the world's most extreme examples of metropolitan primacy. Larger than the combined populations of the next 12 largest cities in Thailand, Bangkok's share of the national urban population has increased over time (from 45 to 63 per cent during 1945-1980). According to United Nations estimates, Bangkok was the 26th largest city in the world in 1985 and is expected to be the 20th largest by the year 2000 (United Nations, 1987).

By developing country standards, Bangkok is a relatively prosperous mega-city. An international communications hub, with aspirations to become a world financial centre, Bangkok has the appearance of a dynamic, modern city. Its population is nearly universally literate, has an average level of life expectancy of more than 70 years, and has relatively low levels of unemployment.

However, although a comparatively small proportion of Bangkok households live in absolute poverty, there are many that subsist on relatively low incomes. Moreover, there has been a widening of income inequalities in recent years (NESDB, 1986). Unemployment among educated youth is very high. Despite extensive investments in new urban infrastructure - e.g., highways, bridges, improvements to the water supply - Bangkok is straining to provide services to its rapidly expanding population. In addition to the longstanding problem of large areas of the city being without piped water, there are problems with poor water quality, land subsidence, high susceptibility to flooding during the monsoon season, and poor environmental conditions. The city is choked by traffic, has an inadequate system of public transport, low travel speeds, and lacks a system of segregated mass transit. Because of imperfections in the private land market, the city has sprawled outward in an unplanned fashion. Large vacant areas have been withheld from development by speculators, forcing commuters to live further out and to commute longer distances. Whereas private developers have responded rapidly to the needs of the upper and middle segments of the housing market, more than one million Bangkok residents continue to live in squatter settlements. With growing per capita incomes, the population is expected to demand more and better services.

I. DEMOGRAPHIC CHARACTERISTICS

A. Population growth

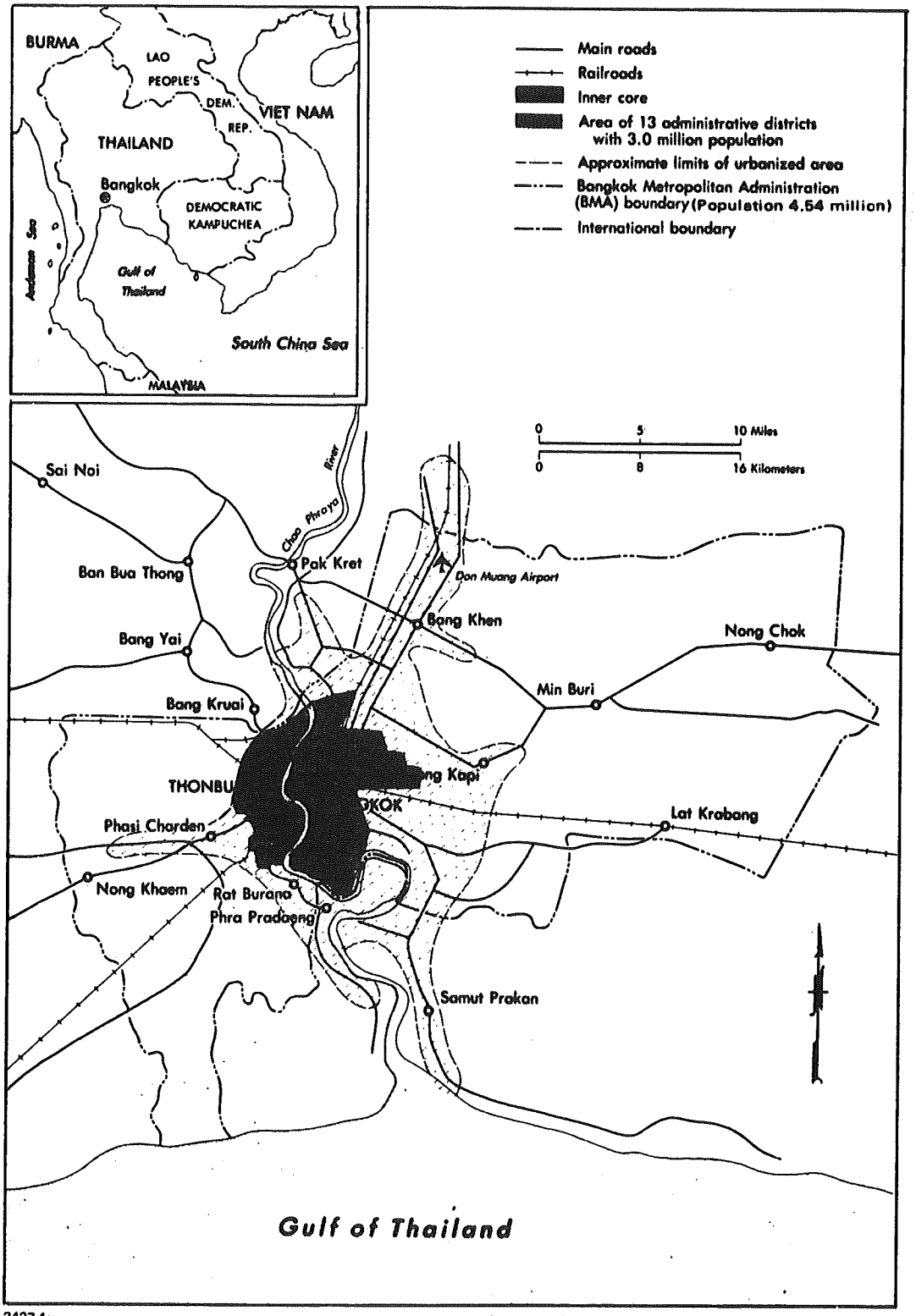
In 1782, the year it became the capital of Thailand, Bangkok had a population of about 400,000, located within an urbanized area of 3.5 square kilometres. Bangkok's population increased slowly, reaching 890,000 in 1937 and about 1,000,000 in 1953. Bangkok added another 1 million inhabitants to its population by 1965, a third million by 1971 and a fourth million by 1974. The 1980 Population and Housing Census enumerated a population of 4,700,000 within the Bangkok Metropolitan Area (BMA), an area of 1,562.5 square kilometres (fig. I). 1/ Correcting for under-enumeration, the population of the BMA was estimated to be about 4,800,000 in 1980, and that of the Bangkok Metropolitan Region (BMR) to be about 6,800,000. 2/ The populations of the BMA and BMR were estimated to have increased to 5,600,000 and 8,000,000, respectively, by 1985 (National Economic and Social Development Board, 1985).

Bangkok's rate of population growth declined to 4.3 per cent per annum during 1960-1970 and then increased to 4.8 per cent per annum during 1970-1978 (Medhi and Pawadee, 1984). Not only was that rate of growth significantly higher than the national urban average of 3.5 per cent, but also it contrasted with the trend towards declining population growth in all of the country's other major regions.

According to the most recent estimates, the rate of population growth in the BMA declined to just over 3 per cent per annum during 1980-1985 (National Economic and Social Development Board, 1985). The growth rate of the Bangkok Metropolitan Region was slightly higher - 3.3 per cent per annum. It is now believed that Bangkok may be concluding a period of high population growth and entering a period of more moderate growth which will continue, however, to yield large absolute population increases.

In regard to basic demographic parameters for the Bangkok Metropolitan Area, expectation of life at birth was 71 years in 1980 (ESCAP, 1986). Total fertility declined by about 10 per cent over the 1970s, from 2.6 to 2.3 children per woman (ESCAP, 1986). The decline has been attributed to several factors, including the high proportion of single women (according to the 1980 census, 45 per cent of women in the BMA aged 15-54 remained single); the comparatively high singulate mean age at marriage (27.8 for males and 26.1 for females); and the widespread use of effective methods of family planning (National Statistical Office, 1985). According to the 1980 census, nearly 54 per cent of currently married women aged 15-49 reported using contraceptives. The oral pill ranked first (being used by 23 per cent

Figure I **Boundaries of Metropolitan Bangkok, 1975**



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Source: K.C. Sivaramakrishnan and Leslie Green *Metropolitan Management: The Asian Experience* (Oxford, Oxford University Press, 1986).

of currently married women), followed by female sterilization (19 per cent) and the IUD (4 per cent) (National Statistical Office, 1984d). The 1984 Survey of Population Change found that there was a 12 per cent increase during 1980-1984 in the number of currently married women in the BMA practicing contraception, bringing the proportion to 58.4 per cent (National Statistical Office, 1985c).

There are significant fertility differentials within the Bangkok Metropolitan Area. A recent ESCAP study found that total fertility was nearly twice as high in the outlying districts of Nong Chok, Min Buri and Lat Krabang as in the central districts, although it was declining more rapidly in the outlying districts (table 1 and fig. I). The ESCAP study also found that fertility had declined along the two major highway corridors from Bangkok to the north and the north-east, underlying the importance of Thailand's well-developed transporation and communications system for its fertility decline (ESCAP, 1986).

Because of the decline in fertility and continuing in-migration of young adults, there have been significant changes in the age structure of the population in the BMA. The proportion of the population aged 0-14 declined from 41 to 29 per cent during 1960-1980, whereas the proportion aged 15-64 increased from 56 to 68 per cent over the same period. The proportion of the population 65 years of age and over remained constant at about 3 per cent. As a result, the total dependency ratio decreased from 78 to 48 per cent between 1960 and 1980. Average household size also decreased from around six persons per household in 1970 to 5.2 persons per household in 1980, mainly because of a decline in the number of very large households - i.e., those with more than nine members (Centre for Housing and Human Settlement Studies, 1985).

B. Migration

There are two principal sources of data on migration to and from Bangkok: the decennial census and the annual migration survey, which has been conducted by the National Statistical Office since 1974. The 1984 migration survey - a stratified single-stage sample of more than 5,700 households - obtained information on the migrants' age, sex, educational attainment, place of previous residence, expected duration of residence, reasons for migrating, occupations before and after migrating, and current employment status (National Statistical Office, 1985d).

Throughout Thailand's modern history, the Bangkok Metropolitan Area (BMA) has been the major receiving area for migrants. As of 1980, the BMA had 1,250,600 lifetime migrants, 3/ who constituted 27 per cent of

Table 1. Estimates of total fertility, by district, of Bangkok Metropolitan Area, 1970-1979

	District (amphoe)	Total fertility rate 1970-1974	Total fertility rate 1975-1979
	Bangkok Metropolitan Area (Standard deviation)	2.58 (0.6641)	2.31 (0.5588)
1.	Phra Nakhon	2.05	1.76
2.	Pom Prap Sattru Phai	2.58	2.08
3.	Pathum Wan	2.27	1.92
4.	Samphan Thawong	2.20	1.76
5.	Bang Rak	1.98	1.67
6.	Yan Nava	2.73	2.54
7.	Dusit	2.51	2.31
8.	Phaya Thai	2.14	1.99
9.	Huai Khwang	2.51	2.38
10.	Phra Khanong	2.82	2.54
11.	Bang Khen	2.58	2.31
12.	Bang Kapi	2.51	2.38
13.	Nong Chok	4.78	3.89
14.	Min Buri	4.10	3.50
15.	Lat Krabang	3.57	3.02
16.	Thon Buri	2.82	2.54
17.	Klong San	2.66	2.31
18.	Bangkok Noi	2.35	2.08
19.	Bangkok Yai	2.51	2.31
20.	Bang Khun Thian	3.35	2.95
21.	Phasi Charoen	3.04	2.79
22.	Taling Chan	3.20	2.86
23.	Rat Burana	3.10	2.95
24.	Nong Khaem	3.41	3.17

Source: Economic and Social Commission for Asia and the Pacific, Declines in Fertility, by District in Thailand: An analysis of the 1980 Census. Asian Population Studies Series, No. 62-A (Bangkok, 1986).

the total population of the BMA. Between 1975 and 1980, some 366,000 persons (who constituted 8.6 per cent of the population five years of age and over) migrated to the BMA from other regions of Thailand: 48 per cent from the central region, 32 per cent from the poor agricultural north-east (32 per cent), 12 and 9 per cent, respectively, from the north and south - regions that are relatively prosperous yet relatively remote (National Statistical Office, 1984b). The largest interregional five-year stream - of 174,900 persons migrating from the central region to the BMA - was mainly offset by a counter-stream of 102,700 persons leaving Bangkok for the central region, resulting in a net gain of only 72,200. The second largest pair of streams was between the BMA and the north-east region. That movement was more uni-directional, however, with 116,500 persons migrating to Bangkok and only 18,500 moving in the opposite direction (National Statistical Office, 1984b).

Of the 48 five-year interprovincial migration streams involving at least 5,000 persons, the BMA was the sending or receiving area in 33 of them. The two largest interprovincial streams were to rapidly growing Bangkok suburbs - one of 26,400 from the capital to Samut Prakarn and the other of 25,800 to Nontha Buri. Pathum Thani in the central region was among the provinces with the highest rates of gain. However, four other provinces in the central region - Samut Songkrawm, Ayutthaya, Nakhon Nayok, and Shai Nat - were among the provinces with the highest net losses, indicating the complexity of the migration process within the Bangkok Metropolitan Region (National Statistical Office, 1984b).

Of the 42 life-time interprovincial migration streams involving more than 20,000 persons, Bangkok was the destination of 23 streams from the central region, five from the north-east, and one each from the north and south. Although there were four life-time migration streams from the Bangkok Metropolitan Area to provinces in the central region, life-time movements were more uni-directional than five-year streams, indicating that suburbanization has increased over the past five years (National Statistical Office, 1984b).

As for the characteristics of recent migrants, migration to the BMA has been heavily concentrated in the young adult age groups. The highest proportion was in ages 20-24 (25 per cent), followed by the 15-19-year olds (22 per cent) and the 25-29-year olds (14 per cent) (National Statistical Office, 1982). Whereas migration streams in other regions of the country have had generally a larger proportion of males, the Bangkok Metropolitan Area has been particularly attractive to female migrants and has increased its attraction over time. The sex ratios of migrants from the north and the north-east were 76 and 80, for example, indicating a significant excess of females over males. With regard to the fertility of migrants, data from the 1980 census demonstrated that migrants in all age groups had a lower average number of children ever

born than did non-migrants. Since a somewhat lower percentage of women migrants were believed to practice contraception, the findings suggested that there was more spousal separation among migrants than among non-migrants (National Statistical Office, 1984b).

The 1984 Survey of Migration into the Bangkok Metropolis and Vicinity found that there was a distinct pattern of seasonal migration to the BMA. Most migrants arrived in Bangkok in February, during the agricultural slack season, or in May, before the beginning of the new school term. The survey found the migrants to be predominantly young (86 per cent were under 30 years of age, as were 78 per cent of migrants to the surrounding provinces) and mainly single (70 per cent of Bangkok migrants aged 15 years and over were single, as were 45 per cent of migrants to the surrounding provinces) (National Statistical Office, 1984b). A majority of the migrants came from villages or from non-municipal areas. The most important reason for migrating to Bangkok was to find jobs (67 per cent). However, 19 per cent of the migrants to Bangkok moved for family reasons, 9 per cent came for further study or vocational training, whereas 5 per cent came for a specific job assignment (National Statistical Office, 1985d). The pattern was somewhat different for migrants to the surrounding provinces, in that a larger proportion were family moves (41 per cent). However, as in the case of Bangkok, the most important factor in migrating to the surrounding provinces was economic (42 per cent). Only 4 per cent came for further study, whereas another 4 per cent came for a specific job assignment. After their arrival, migrants quickly found employment: indeed, 79 per cent of those sampled were in the labour force and 98 per cent had been employed during the survey period. With respect to previous employment, 83 per cent of migrants to Bangkok (and 59 per cent of migrants to the five surrounding provinces) had been farmers (and related workers) before migrating, with the remainder having been employed as craftsmen, labourers, or in sales or services. After migration fewer than 2 per cent of migrants remained in the occupations they had been in before. Almost half (46 per cent) were employed as craftsmen, production workers or labourers, whereas 42 per cent were employed as service workers (National Statistical Office, 1985d).

C. Population projections

Bangkok's first major physical planning exercise, the Greater Bangkok Plan (1960), identified a target population of 4,500,000 million in 1990. However, the updated Greater Bangkok Plan (1971) revised the target population upwards to 6,500,000. The Fifth Five-Year Plan (1982-1986) reported that the population of the BMA would be limited consciously to 6,000,000 inhabitants by 1986, whereas the five surrounding provinces - Samut Prakarn, Pathum Thani, Nontha Buri, Nakhon

Pathom, and Samut Sakorn - would be planned to accommodate 2,300,000 inhabitants. In other words, the total population of the BMA and surrounding towns was targeted to be around 8,300,000 by the end of the plan period.

As for the distribution of population within the metropolitan area, in the structure plan prepared in conjunction with the Fifth Five-Year Plan, it was proposed that a green belt would be established outside the inner ring road, and that there would be significant growth within the central city and in towns outside the urbanized area. The Metropolitan Bangkok Short-Term Urban Transport Review contained two additional scenarios: one of uncontrolled growth, which assumed that population growth would continue to be influenced by market forces, causing a decline in the population of the central city and massive growth in the outer suburbs and resulting in a total population of 9,900,000 in 2001; and one of managed population growth, which was similar to the above scenario but assumed that there would be slower growth in the outer areas and some use of public sector investment to guide development, resulting in a total population of 9,600,000 (National Economic and Social Development Board and Halcrow Fox Associates, 1985).

The most recent population and employment projections were prepared in 1985 for the Bangkok Metropolitan Region Study, which was conducted by the National Economic and Social Development Board (NESDB), with the assistance of the World Bank. The cohort component method was used to project the population by province, and the curve-fitting and varied ratio methods were used to project population by smaller areas. From 1985 to the year 2000, life expectancy at birth was assumed to increase continually but at a decreasing rate, and differences between the sexes were assumed to diminish gradually. The total fertility rate for each province was assumed to decline at a decreasing rate and to be constant after it reached the level of 1.6 for the Bangkok Metropolitan Area (BMA) and 1.7 for the remainder of the Bangkok Metropolitan Region (BMR). Two alternative migration assumptions were considered: that net migration into the BMR would increase by 5 per cent every five years but that the growth of the BMA and Samut Prakarn would decline by 5 per cent over the same period; and that net migration into the BMR would increase by 10 per cent every five years and that the growth of the BMA and Samut Prakarn would decline, as in the other alternative. The first assumption was selected, mainly because it was consistent with both government policy, which aims at reducing migration to the BMA and redistributing population and economic activity into other regions, and with census data, which indicate a slowing of migration to the region. Using the above assumptions, the population of the Bangkok Metropolitan Region (BMR) was projected to increase by an average annual rate of 2.5 per cent during 1985-1990, by 2.1 per cent during 1990-1995, and by 1.8 per cent during 1995-2000, reaching a total population of 9,000,000 in 1990 and 11,300,000 in the year 2000.

In regard to the distribution of population within the Metropolitan Region, the study predicted that the recent trend in urban development would continue. Whereas a number of areas within the BMA will experience negative growth or very low rates of population growth, the bulk of new growth is expected to occur in rapidly growing and transitional areas to the east and north-east of central Bangkok. Between 1985 and 2000, the study predicted that the population of the combined areas of Yan Nava, Dusit, Huai Khwang, Phra Khanong, Bang Khen, Bang Kapi, Huang Samut Prakarn and Phra Pradaeng would grow by some 1.8 million inhabitants and would account for perhaps 50 per cent of total population growth in the BMR (table 2).

Table 2. Projected population size, rate of growth, and density, by district, of Bangkok Metropolitan Area (BMA), 5 surrounding provinces and Bangkok Metropolitan Region (BMR), 1980–2000

	Population (thousands)					Rate of growth (percentage)				Density: (per sq. km.) (thousands)		
	1980	1985	1990	1995	2000	1980–1985	1985–1990	1990–1995	1995–2000	1985	1990	2000
BMA												
1. Phra Nakhon	114.9	106.4	107.9	109.6	109.6	-1.2	-0.1	0.3	-	19.6	19.5	19.8
2. Pom Prap Sattru Phai	177.7	172.0	174.9	181.1	184.2	-0.7	0.3	0.7	0.3	89.0	90.6	95.4
3. Pathum Wan	215.5	206.6	213.7	225.7	233.9	-0.8	0.7	1.1	0.7	24.7	25.5	26.0
4. Samphan Thawong	72.5	69.8	70.7	72.8	73.7	-0.7	0.3	0.6	0.2	49.3	49.9	52.1
5. Bang Rak	121.8	137.7	153.1	165.7	174.1	2.5	2.2	1.6	1.0	24.9	27.7	31.5
6. Yan Nava	362.3	422.7	480.6	533.4	582.8	3.1	2.6	2.1	1.8	11.5	13.0	15.8
7. Dusit	446.3	503.5	562.4	622.7	681.9	2.4	2.2	2.1	1.8	22.7	25.3	30.7
8. Phaya Thai	481.6	529.4	565.7	592.0	610.4	1.9	1.3	0.9	0.6	31.7	33.9	36.6
9. Huai Khwang	192.1	233.4	275.3	315.5	358.6	4.0	3.4	2.8	2.6	10.3	12.1	15.8
10. Phra Khanong	498.4	587.1	675.6	760.7	839.9	3.3	2.9	2.4	2.0	4.1	4.7	5.9
11. Bang Khen	367.4	491.8	609.8	710.3	808.9	6.0	4.4	3.1	2.6	2.9	3.6	4.8
12. Bang Kapi	244.0	377.4	497.9	604.0	710.1	9.1	5.7	3.9	3.3	2.5	3.3	4.8
13. Nong Chok	47.9	52.4	56.3	60.4	64.7	1.8	1.5	1.4	1.4	0.2	0.2	0.3
14. Min Buri	52.8	61.8	71.3	82.0	93.9	3.2	2.9	2.8	2.8	0.4	0.4	0.5
15. Lat Krabang	40.7	47.8	55.3	63.6	73.1	3.3	2.9	2.8	2.8	0.4	0.4	0.6
16. Thon Buri	248.6	268.5	284.9	297.8	307.9	1.6	1.2	0.9	0.7	31.1	33.0	35.7
17. Klong San	133.7	139.8	144.5	148.1	149.9	0.9	0.7	0.5	0.2	23.1	23.9	24.8
18. Bangkok Noi	354.4	382.8	406.1	424.6	438.9	1.6	1.2	0.9	0.7	16.4	17.4	18.8
19. Bangkok Yai	96.1	104.2	111.4	117.8	123.3	1.6	1.4	1.1	0.9	16.9	18.0	20.0
20. Bang Khun Thian	193.8	234.1	276.6	319.2	360.1	3.9	3.4	2.9	2.4	1.3	1.5	2.0
21. Phasi Charoen	176.7	209.8	240.4	267.5	293.5	3.5	2.8	2.2	1.9	3.9	4.5	5.4
22. Taling Chan	640.0	78.1	94.2	113.2	135.7	4.1	3.8	3.7	3.7	1.0	1.2	1.7
23. Rat Burana	108.9	131.9	153.4	172.2	190.1	3.9	3.1	2.3	2.0	3.1	3.6	4.4
24. Nong Khaem	40.5	52.8	67.5	84.4	102.9	5.5	5.1	4.6	4.0	1.1	1.4	2.1
Sub-Total	4 852.6	5 603.8	6 349.5	7 044.3	7 702.1	2.9	2.5	2.1	1.8			

Provinces												
Nakhon Pathom												
25. Huang Nakhon Pathom	192.3	218.9	246.7	277.3	309.7	2.6	2.4	2.4	2.2	0.4	0.5	0.6
26. Nakhon Chaisri	82.7	89.1	95.1	101.2	107.1	1.5	1.3	1.3	1.1	0.3	0.3	0.3
27. Sam Phran	84.0	93.4	102.9	113.2	123.7	2.2	2.0	1.9	1.8	0.4	0.4	0.5
28. San Len	78.5	83.3	87.0	88.9	95.8	1.2	0.9	0.5	1.5	0.2	0.2	0.2
29. Kamphaeng Saen	75.2	81.0	87.3	95.8	99.1	1.5	1.5	1.9	0.7	0.2	0.2	0.3
30. Don Tom	32.2	37.1	42.4	47.5	52.5	2.9	2.7	2.3	2.0	0.2	0.3	0.3
Nontha Buri												
31. Huang Nontha Buri	169.8	212.2	258.2	317.2	391.2	4.6	4.0	4.2	4.3	2.8	3.4	5.1
32. Bang Wa Thong	35.7	39.4	42.4	45.4	49.0	2.0	1.5	1.4	1.6	0.3	0.4	0.4
33. Pak Kret	78.0	95.5	115.0	139.4	167.9	4.1	3.8	3.9	3.8	1.1	1.3	1.9
34. Bang Kruai	44.9	51.5	57.9	65.3	73.0	2.8	2.4	2.5	2.3	0.9	1.0	1.2
35. Bang Yai	28.8	30.5	33.0	34.9	37.3	1.1	1.6	1.1	1.4	0.3	0.3	0.4
36. Sai Noi	25.6	28.8	31.7	35.0	39.0	2.4	1.9	2.0	2.2	0.1	0.1	0.2
Pathum Thani												
37. Huang Pathum Thani	61.6	70.6	80.7	92.3	106.9	2.8	2.7	2.7	3.0	0.6	0.7	0.9
38. Sam Khok	30.0	32.8	35.5	38.2	44.1	1.8	1.6	1.5	1.5	0.3	0.4	0.4
39. Lat Lum Koe	28.6	31.6	34.8	38.2	42.2	2.1	1.9	1.9	2.0	0.2	0.2	0.2
40. Thanyaburi	59.9	74.3	91.9	113.6	141.9	4.4	4.3	4.3	4.6	0.7	0.8	1.3
41. Lam Luk Ka	50.3	59.7	70.7	84.0	100.9	3.5	3.5	3.5	3.8	0.2	0.2	0.3
42. Khlong Luang	69.5	86.8	108.0	134.5	168.9	4.6	4.5	4.5	4.7	0.3	0.4	0.6
43. Nang Sua	32.2	37.1	42.7	49.2	57.4	2.9	2.8	2.9	3.1	0.1	0.1	0.1
Samut Prakarn												
44. Huang Samut Prakarn	236.0	288.3	348.0	411.2	490.0	4.1	3.8	3.4	3.6	1.0	1.2	1.7
45. Pra Pradaeng	148.5	182.6	222.2	264.6	315.6	4.2	4.0	3.6	3.6	2.8	3.4	4.9
46. Bang Pli	71.9	84.7	98.7	114.4	130.7	3.4	3.1	3.0	2.7	0.3	0.3	0.4
47. Bang Bo	46.4	50.2	53.4	56.3	58.9	1.6	1.3	1.1	0.9	0.2	0.2	0.3
Samut Sakorn												
48. Huang Samut Sakorn	125.6	141.8	161.0	182.1	210.4	2.6	2.5	2.5	2.9	0.3	0.4	0.5
49. Krathum Baen	59.0	69.9	83.1	99.0	119.6	3.5	3.5	3.6	3.9	0.5	0.6	0.9
50. San Phaeo	71.4	75.5	79.8	86.0	92.9	1.1	1.1	1.5	1.6	0.3	0.3	0.3
Sub-Total	2 018.6	2 349.6	2 710.1	3 124.8	3 625.7	3.1	2.9	2.9	3.0			
TOTAL BMR	6 871.2	7 953.4	9 059.6	10 169.1	11 327.8	3.0	2.6	2.3	2.2			

Source: NESDB, Bangkok Metropolitan Region Study, unpublished report, (Bangkok, 1985).

II. THE ECONOMY

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

Following the destruction of the 400-year-old capital city of Ayuthya by Burmese invaders in 1767, a general of the retreating Thai army established a new capital on the west bank of the Chao Phraya River at Thon Buri. His successor, General Chao Phraya Chakri, founded Thailand's present dynasty and, for security reasons, moved the new capital in 1782 across the river to Bangkok - a location that was well protected from invaders by the river on the west and by a vast swampy plain stretching throughout its hinterland.

The rulers of the Chakri dynasty began the task of national reconstruction, building or restoring public buildings, monasteries and temples, and constructing a fortified island city. Klongs (canals) were dug in the flat, alluvial terrain and served as the city's major transportation arteries. Opened to the west in 1818 after nearly a century and a half of isolation, Bangkok gradually began to absorb western influences. During the 1850s, under King Rama IV, Bangkok developed into an important commercial centre. In the 1860s, beginning with the conversion of an old trail along the river into the country's first land-based transportation artery, Bangkok gradually began to lose its water-borne character.

A century later, Bangkok's role as a major military supply base during the war in Viet Nam led to its emergence as a major trading and commercial centre. Assisted by active tariff protection, Thailand developed a highly capital-intensive, import-substitution type of economy. The predominant consumer goods industries and import-dependent industries have located in and around Bangkok, which is the country's leading port, largest consumer market, and the centre of the country's distribution network. Export industries have also concentrated in Bangkok due to its access to port facilities (through which nearly all the country's exports and 85 per cent of its imports pass), communications, and financial services. As of 1983, 32 per cent of gross domestic output was generated in Bangkok and about half of value added. Moreover, 38 per cent of Thailand's industrial firms were located in the BMA and about 45 per cent in the Bangkok Metropolitan Region (World Bank, 1984).

B. Recent performance of the economy

Thailand's economy underwent dramatic changes over the past two decades. From an agricultural economy based upon a narrow range of export commodities - e.g., rice, rubber, tin and teak - the country

began industrializing rapidly. Over the past decade, however, several major threats emerged which endangered the momentum of Thai economic growth. The dramatic oil price increase of 1979-80 pushed the country's import bill up dramatically and necessitated large investments in alternative sources of energy. Moreover, the presence of hostile forces along the Thai-Vietnamese border required a substantial increase in defence spending.

Although agriculture's share in GDP growth declined sharply over the past decade, it has continued to be the driving force behind economic growth. However, the much slower growth experienced by agriculture in the 1980s reflected the closing of the agricultural land frontier. Growth in manufacturing has also slowed in recent years. The most buoyant sectors have been services such as banking, communications and defence. Construction, which experienced steady growth in the 1970s, has been relatively stagnant. Tourism has continued to be Thailand's number one source of foreign exchange.

Mainly because of low commodity prices for agricultural exports and restrictive trade practices in its major overseas markets, Thailand had difficulty in recent years in increasing its export earnings, which adversely affected its foreign debt. Moreover, the fall of the Thai baht against Western currencies - although making Thai exports more competitive - caused debt servicing to be more expensive. Indeed, servicing the debt rose to as much as 25 per cent of the annual budget in fiscal 1986/87, despite a refinancing of some 1.4 billion in 1985/86 (The Economist Intelligence Unit, 1986b).

During 1986, Thailand's severe external imbalances were brought under control, partly because of the Government's austerity drive, and partly because of windfalls from the international oil price slump. Exports grew by 15.5 per cent during the first half of 1986, mainly because of a strong manufacturing sector (Far Eastern Economic Review, 1986). Moreover, selected indicators such as private investment and industrial production began showing a modest upturn after steadily declining over several years.

Based on an export-led strategy designed to achieve 5 per cent annual economic growth, Thailand aims to emerge as a newly industrialised country by the end of the Sixth Plan in 1991. In agriculture, the plan's central theme is to diversify out of the traditional basic crops into about 200 alternative cash crops. The main thrust in industry will be diversification into export-oriented light manufacturing and engineering products. Tourism is assigned a high priority. One of the main areas in which the Sixth Plan differs from preceding plans is that the private sector will be the engine of growth, with a corresponding decline in the role of the public sector.

C. Spatial structure of the metropolitan region

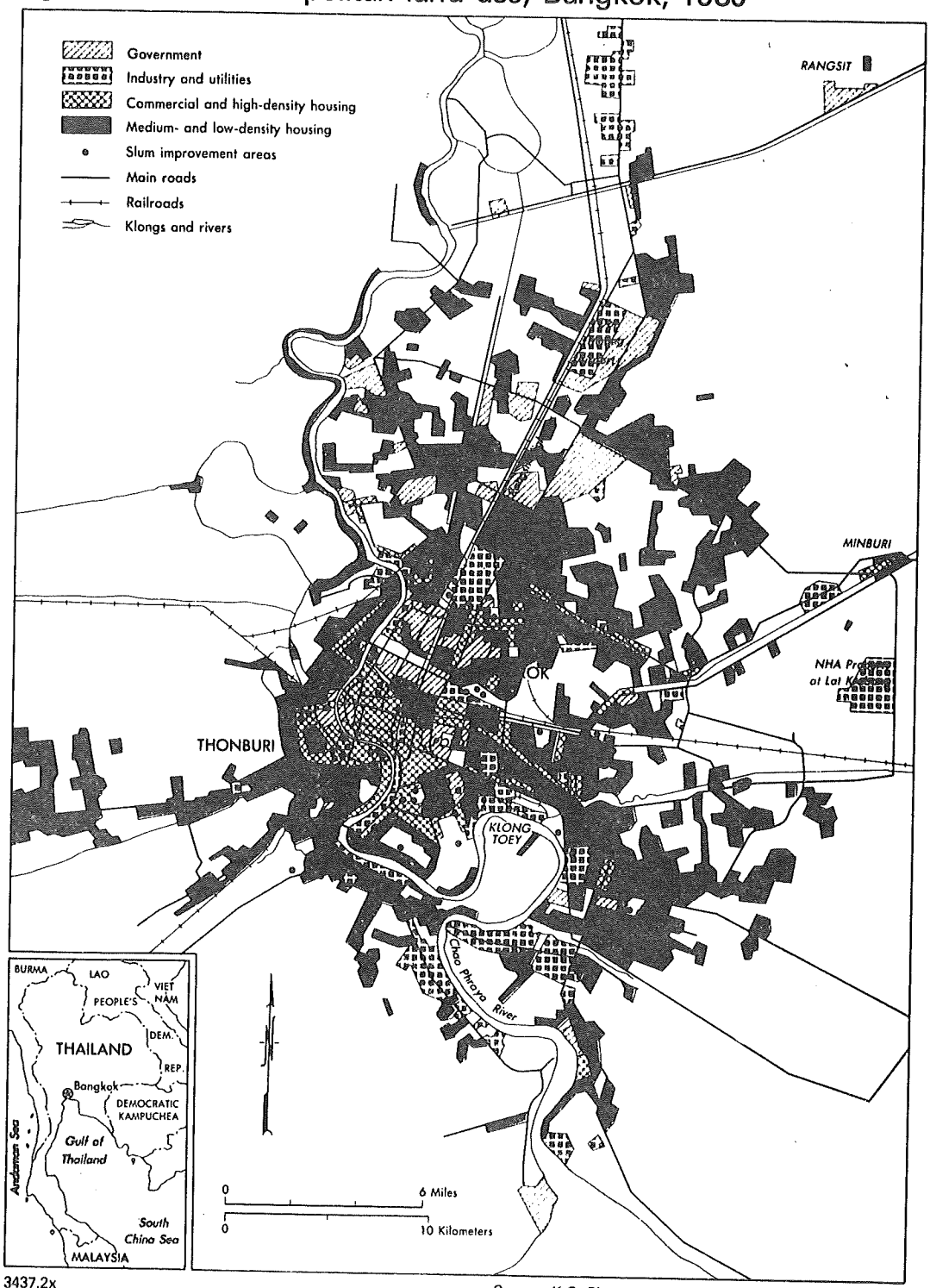
The Bangkok Metropolitan Area (BMA) is an area of 1,565 square kilometres located on the delta plain of the Chao Phraya River, about 40 kilometres from the Gulf of Thailand. Bisected by the river along a north/south axis, Bangkok has spread outward in a radial concentric pattern from the old city core. Historically, the growth of Bangkok was somewhat stunted on the western bank of the river, partly because of the lack of river crossings, and partly because land in the west was mainly used for orchards - rather than for the cultivation of rice, as it was in the east and south - and was therefore too valuable to be converted to residential uses (Kammeier, 1984). As more bridges were constructed, however, and ferries put into operation, the barrier function of the river substantially decreased.

Bangkok's oldest sector - the area enclosed within a loop of the river, which contains the city's major wats, palaces and historic monuments - constitutes the central core. It and adjacent areas have been rapidly transformed in recent years. Formerly high-income residential areas near the old centre have been converted to intensive commercial use, whereas mixed-use shop-house (commercial/residential) areas have been replaced by high rise office and large-scale shopping complexes. The city currently has multiple nuclei as a result of this expansion, with Pratunam, Raja Prasong, Siam Square, Silom and Suriwong constituting the major business districts.

Up until the mid 1970s, Bangkok was still a relatively dense and compact city. Over the past decade, however, it has grown, with large vacant areas lying among thin ribbons of development which stretch along the major roads (fig. II). Typically, new areas have been opened up by road construction, and developers and owners have built long dirt roads providing access to individual lots. As more and more individual houses and small and large private housing estates have been constructed, mixed with commercial and industrial sites, the entire fringe area (particularly along the eastern side) has been gradually converted into sprawling, unplanned suburbs.

Between 1968 and 1979 the residential area of the BMA increased from 41.5 to 114.3 square kilometres, or by an average annual rate of 11 per cent (Centre for Housing and Urban Settlement Studies, 1985). The high rate of consumption of land was explained by both high population growth and the relocation of population from high-density to low-density areas. Declines in residential land-use occurred in densely populated central business districts - e.g., Pom Prap, Pathum Wan, and Bang Rak on the Bangkok side, and in Thon Buri district on the Thon Buri side. Increases in residential use occurred in all directions, but the main thrust of expansion was in the direction of Bang Kapi, Ban Khen, and Min

Figure II. Metropolitan land use, Bangkok, 1980



3437.2x

Source: K.C. Sivaramakrishnan and Leslie Green *Metropolitan Management: The Asian Experience* (Oxford, Oxford University Press, 1986)

Buri in the north, and Huang Samut Prakarn and Phra Khanong to the south and east (Centre for Housing and Urban Settlement Studies, 1985). Increases in residential land use on the Thon Buri side were also substantial. A number of slums moved out from the inner core - where the former slum areas were converted to more profitable uses - to suburban areas where land was less expensive. Total industrial land-use increased by 7.6 per cent between 1968-1979 (Centre for Housing and Urban Settlement Studies, 1985). The main thrust of industrial land-use expansion was in Lat Krabang, Min Buri and Bang Kapi in the north and north-east. However, the old industrial areas on the Thon Buri side also expanded.

As summed up in a report prepared by the National Housing Authority:

> [Bangkok's] development pattern...has been virtually unplanned. Although the construction of roads has been the most important determinant of the spatial orientation of development of all kinds, there has been little apparent attempt by the agencies responsible for road design and construction to assess or evaluate the growth-inducing effects of planned projects. Nor do these agencies seem to have paid much attention to the various proposed general plans for the region, none of which, in any case, has ever been approved. From that standpoint, development has been arbitrary...[and] a highway built for the purpose of connecting Bangkok with distant points becomes an unintended ribbon of development (Centre for Housing and Human Settlement Studies, 1985).

D. The sectoral and spatial distribution of jobs

According to the 1980 census, 56.3 per cent of the population of the BMA 11 years of age and over was economically active (i.e., employed, looking for work, or waiting for the farm season). The rate of open unemployment was about 7.4 per cent. Craftsmen, production workers and labourers were the largest occupational group with about 29.3 per cent, followed by sales workers, service workers, and clerical and related workers with 21.4, 12.6, and 10.0 per cent of the total, respectively. The expected future pattern of employment growth is one of continuing growth of tertiary employment in the central city, along with minor factory expansion in strategic areas on the periphery (Bang Khen, Samut Prakarn, Taling Chan and Rat Burana), and a steady decline of the old shop-house industries in the central city and the inner suburbs.

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

In recent years, the Bangkok connurbation has spread steadily outwards into the five neighbouring provinces. Although the expansion has been largely the result of market forces - probably reinforced by government incentives to export-oriented industries - the Government now encourages the development of the satellite cities in the surrounding provinces. Ironically, whereas decentralization out of Bangkok into the central region may relieve some of the capital's congestion costs, it will probably make little contribution to the important national policy of achieving interregional equity. On the contrary, it may make interregional dispersion less likely, because the spatial reorganization of the Greater Bangkok region is likely to strengthen the already very strong competitive edge of the core region and reinforce its dominance (Richardson, 1981).

As noted above, the unique characteristic of Thailand's urban hierarchy is the extreme form of its primacy. Bangkok is about 45 times larger than the second city of Chiang Mai and 36 times larger than the twin cities of Songkhla-Hat Yai. The capital is 5.8 times larger than the combined populations of the next 12 largest cities. Moreover, it is growing faster than almost any other city in the country. Because of the high rural population share, Bangkok's share of the national population remains quite small (about 11 per cent of the total), but its share of the urban population rose from 45 per cent in 1945 to 63 per cent in 1980. This extreme primacy makes the design of an effective urban development strategy more challenging than in almost any other country.

III. DECENTRALIZATION AND LOCATION

A. The evolution of spatial strategies

Initially, in the late eighteenth century when the city was founded and the new king contributed to planning its location and urban form, Bangkok was a planned city. In later years, the man-made canals, the regular grid pattern of the tree-lined streets, and the location of bridges over the Chao Phraya River were all planned with the personal involvement of the succeeding kings (Kammeier, 1984).

Modern urban planning began in the late 1950s, when the newly established National Economic Development Board (later renamed the National Economic and Social Development Board/NESDB) was commissioned to prepare Bangkok's first master plan. The resultant Greater Bangkok Plan (1960) was a 30-year land use plan for an area of 460 square kilometres. The plan was never officially adopted and had little more than symbolic impact (Kammeier, 1984). However, it marked the beginning of a continuous planning process.

In 1962 a Department of Town and Country Planning was established within the Ministry of Interior and was charged with periodically updating and revising the Greater Bangkok Plan. The first revision of the Plan, which was issued in 1971, adjusted the target population upward (from the 4,500,000 inhabitants in 1990 cited in the original plan to 6,500,000), expanded the planning area, modified previous land-use designations, and emphasized the importance of developing the road network to cope with the increasing traffic volume. However, the City Planning Division of the then Bangkok Municipality more or less simultaneously prepared its own alternative updated version of the Greater Bangkok Plan. The alternative had a longer time framework (up to the year 2000 rather than to 1990) and proposed very different land-use patterns and transport networks. However, neither the alternative plan nor any of the subsequent revisions of the Greater Bangkok Plan was officially adopted (Kammeier, 1984).

The next major step in the spatial planning process was the drafting of the Greater Bangkok Plan 2000, in conjunction with the preparation of Thailand's Fourth National Development Plan (1977-1981). That Plan was different from its predecessors in that it analysed the spatial dimensions of national and regional population growth as well as the possible impacts of market forces, and noted the desirability of promoting a pattern of polycentric growth (in contrast to all preceding plans, which had assumed continuing centralization). The Greater Bangkok Plan 2000 shared the fate of its predecessors. It was regarded at best as a guideline and had a negligible impact on private-sector investments, but it left a major legacy by introducing the concept of mass transit corridors and an expressway system, ideas that were

subsequently adopted (Kammeier, 1984). As a means of reducing the growth of Bangkok, the Fourth Plan also designated nine growth centres (Chiang Mai, Phitsanulok, Ubon Ratchathani, Nakhon Ratchasima, Khon Kaen, Udon Thani, Songkhla-Hat Yai, Phuket and Chon Buri) that would be eventually upgraded to medium-sized cities in the 100,000-300,000 range and recommended a stronger industrial location policy. However, few additional resources were made available during the plan period to promote these growth centres, and spatial policy instruments were not strengthened to any noticeable degree.

Emphasizing that "the major development issue is how to slow down Bangkok's population growth and lessen its economic dominance," the Fifth National Economic and Social Development Plan (1982-1986) was critical of past policy efforts. It noted, for example, that the majority of development projects in Bangkok had been narrowly designed to solve immediate problems. Projects had frequently squandered scarce resources because they were not part of a broader long-term strategy. Moreover, "the Government's policy represented a one-sided approach, which...disregarded the management of the surrounding towns" (National Economic and Social Development Board, 1982).

To remedy those deficiencies, the Fifth Plan outlined a comprehensive strategy for Bangkok's development: The Structural Plan for the Development of the Bangkok Metropolis and Vicinity Towns. The basic aim of the Structural Plan was to decentralize economic activity and thereby diffuse growth from the capital to the five surrounding towns of Samut Prakarn, Pathum Thani, Nontha Buri, Nakhon Pathom, and Samut Sakorn (located in the provinces of the same name). As Bangkok gradually became "a centre of culture, administration, services and economic production using only highly skilled labour and sophisticated technology", the outlying areas would be developed as planned communities with a high degree of self-sufficiency, thereby ensuring that residents would not need to commute to Bangkok for employment or higher-level services (National Economic and Social Development Board, 1982). The Plan noted that agricultural land would be preserved in and around the five surrounding towns. In order to prevent the urbanized area of Bangkok from spreading further, a green belt would be designated around the current boundary of the city of Bangkok.

Another important spatial component of the Fifth Plan was the development of the Eastern Seaboard sub-region into the country's major location for basic industries. In the words of the plan, "the Eastern Seaboard sub-region will serve as a potent employment generator and accord well with the policy to decentralize Bangkok and diffuse growth to the regions in a systematic manner....development of the Eastern Seaboard will effectively absorb the flow of migrant labour which would otherwise have been directed toward Bangkok." In addition, the Plan

noted that five regional urban centres - Chiang Mai, Khon Kaen, Nakorn Ratchasima, Chon Buri and Songkhla-Hat Yai - would be developed as growth centres (targetted to be in the 150,000-300,000 range by 1986) and could eventually serve as counter-magnets to Bangkok. Moreover, the six remaining provinces - Phitsanulok, Nakorn Sawan, Udon Thani, Surat Thani and Phuket - were also to be planned and developed as second-generation urban growth centres.

The Fifth Plan was not very specific in regard to policy instruments and measures. It noted that tax exemptions and other fiscal incentives for investing in Bangkok and its immediate vicinity would be abolished. Moreover, the expansion of university facilities in the Bangkok Metropolitan Area would be restricted. Finally, the Plan reported that industrial estates "will be speedily set up in the regional urban growth centres of Songkhla-Hat Yai, Chon Buri and the Chiang Mai-Lamphun area" (National Economic and Social Development Board, 1982).

B. Current spatial strategies

According to the summary Sixth National Economic and Social Development Plan (1987-1991), controlling the growth of the Bangkok Metropolitan Area remains an important national priority. In terms of implementation, spatial policies will be implemented, as in the past, through physical planning measures, e.g., land use controls and zoning regulations. In addition, however, NESDB has divided the Bangkok Metropolitan Region into four strategic areas - the Central Business Area; Rapidly Growing Suburban Area; Industrial Area; and Outer BMR Area 4/ - for which complementary core investment strategies will be implemented. In the macro-economic context, a number of austerity measures to be implemented during the Sixth Plan, e.g., sharp restrictions on the development budget, maintenance of a ceiling on new public foreign borrowing, and reduction of the subsidies that residents of the metropolitan area have long enjoyed, are expected to have significant impacts on Bangkok (National Economic and Social Development Board, 1986).

However, considerable investment is planned for Bangkok under the Sixth Plan. Much of the investment is aimed at coping with existing urban problems and at providing for the expected steady growth of Bangkok's population to 9.3 million by 1990. A number of ongoing or proposed large-scale infrastructure projects could possibly counteract the effects of the Government's explicit decentralization policies. They include the massive (4.6 billion Baht) privately-financed World Trade Centre complex being constructed in a prime location in central Bangkok; the expansion of Don Muang airport, which is aimed at

developing Bangkok into a first-rank regional communications hub; and the proposed construction of an elevated highway linking the airport with the central city.

Beyond Bangkok, there has been continuing decentralization of population and economic activity into the five surrounding provinces, a phenomenon that may be as much the result of market forces (e.g., lower land prices on the periphery, construction of highways opening up new areas) as of explicit governmental policies. After more than a decade of discussion, the Government's Eastern Seaboard strategy may be finally under way. Whereas development of the Eastern Seaboard was one of the major spatial strategies outlined in the Fifth Plan, the strategy subsequently fell into disfavour. In its place, the Government, with the support of NESDB and the Ministry of Industry, advocated development of a large heavy industrial complex, including a port and an industrial estate, at Map Ta Put in Rayong Province. Following the change of Government, however, in 1986 there was a major policy shift. Despite recommendations from the World Bank that cuts in public investment could perhaps best be made by rescheduling all or part of the Eastern Seaboard programme, the Government now seems determined to go ahead, beginning with the development of a mixed set of industrial enterprises and an export processing zone at Laem Chabang.

To promote regional equity, the Government intends to develop other industrial estates in peripheral areas, as outlined in the Fifth Plan. It has faced considerable problems, however, in attracting industry to the north, as illustrated by the case of the Lamphung industrial estate. Despite a package of locational incentives - e.g., a 20-per-cent cut in utility rates, a 30-per-cent cut in freight rates between the estate and Klong Toei port, commissions to persons bringing in new investors, and retroactive slashing of land prices by about one third - and controls - e.g., the requirement that polluting industries in the north locate in the Lamphung estate - the 740-hectare estate, which cost 358 million baht to establish, had attracted only seven investors on a total of 10 hectares by early 1986. Among the suspected reasons for its lack of success are the fact that it is far from the nearest seaport. Another problem cited by potential investors was the concentration of investment privileges upon larger enterprises, when the bulk of potentially interested investors in the northern region are in small-scale industries (The Economist Intelligence Unit, 1986).

Recently, the Minister of Industry announced the intention to develop a third estate in the southern province of Songkhla. Whereas the Songkhla estate will have many of the same locational advantages as Laem Chabang (e.g., a location close to a new deep sea port), it will have to be carefully planned if it is to compete with the export processing zone (The Economist Intelligence Unit, 1986b). Moreover, the

simultaneous development of the Laem Chabang and Songkhla estates may cause further difficulties for the Lamphun development. In any event, the Government estates will have to compete with the highly successful industrial estates built around Bangkok. The 240-hectare privately developed Nava Nakorn estate, for example, which is located 50 kilometres from Bangkok, entered its second phase of development in late 1986 and is expected to be fully subscribed within three years (The Economist Intelligence Unit, 1986b). Progress at the Bang Poo industrial estate on the eastern outskirts of Bangkok has also been excellent, with 65 investors now secured and land sales of 80 million baht during 1986 (The Economist Intelligence Unit, 1986d).

IV. ISSUES AND SECTORS

A. The labour market

The share of the economically active population in the BMA employed in agriculture, which was already low in 1970 (9.9 per cent), has continued to decrease. The BMA experienced an increase in employment in most other sectors, although services grew much more slowly than employment as a whole (National Statistical Office, 1984). According to employment forecasts prepared in conjunction with the Bangkok Metropolitan Region Study, employment in manufacturing in the BMA is forecast to decline in absolute terms, although it will still account for around 200,000 jobs by the year 2000. Employment in all other sectors is expected to increase, with total employment in the BMA expected to reach about 2,500,000 by the end of the century.

Looking at employment forecasts for the Bangkok Metropolitan Region as a whole (see table 3), the shares of both banking and manufacturing in total employment are expected to decline, although there will be modest increases in the numbers of workers in those sectors. Employment in both transport and services is expected to triple by the end of the century, with services increasing its share in total employment to more than 40 per cent. Employment in construction is forecast to expand by about two and a half times and employment in utilities to double.

Employment forecasts by sector vary greatly for different parts of the BMR. In the contiguous province of Samut Prakarn, agriculture is forecast to decline as a result of the rapid conversion of land to urban uses. However, employment in manufacturing and in a number of other sectors (e.g., electricity, transport, trade, banking and public administration) is expected to increase, producing a rise in total employment. In Nontha Buri, however, total employment is forecast to decline as a result of a decline in agriculture and the spread of residential land uses. The primary sector is expected to decline quite rapidly in both Nakhon Pathom and Samut Sakorn (in the latter, largely because of problems in the fishing industry). However, manufacturing and services are forecast to expand significantly their employment shares, mainly because of spillover effects from Bangkok. In Pathum Thani, agriculture and manufacturing are expected to experience continuing growth, with manufacturing becoming the largest employer by the year 2000.

Unemployment in Bangkok by international standards is fairly low. However, the Government is actively concerned with the unemployment problem because it is mainly concentrated among young, educated and therefore more politically volatile workers. The numbers graduating at secondary, vocational and university levels have risen to 400,000

Table 3. Bangkok Metropolitan Region employment forecast, 1985–2000

Sector	Number employed (thousands)				Distribution (percentage)				Rate of change (percentage)				Growth (percentage)			
	1985	1990	1995	2000	1985	1990	1995	2000	1985–1990	1990–1995	1995–2000	1985–2000	1985–1990	1990–1995	1995–2000	1985–2000
Agriculture	130.8	139.7	155.8	176.6	11.3	10.0	8.9	7.7	1.3	2.2	2.5	2.0	3.8	4.6	3.9	4.1
Mining																
Manufacturing	409.4	453.3	477.8	487.8	35.4	32.6	27.4	21.4	2.1	1.1	0.4	1.2	18.9	6.9	1.9	7.0
Construction	89.2	122.3	163.6	215.0	7.7	8.8	9.4	9.4	6.5	6.0	5.6	6.0	14.2	11.7	9.6	11.2
Electricity	17.6	22.4	28.1	35.4	1.5	1.6	1.6	1.6	4.9	4.6	4.7	4.8	2.1	1.6	1.3	1.6
Transport	101.3	123.7	183.3	298.0	8.7	8.9	10.5	13.1	4.1	8.2	10.2	7.5	9.6	16.9	21.4	17.5
Banking	84.3	88.9	93.7	99.9	7.3	6.4	5.4	4.4	1.1	1.1	1.3	1.1	2.0	1.4	1.1	1.4
Services	325.2	440.0	640.5	966.7	28.1	31.7	36.8	42.4	6.2	7.8	1.1	7.5	49.4	56.9	60.8	57.2
Total	1 158.0	1 390.3	1 742.9	2 279.4	100	100	100	100	3.7	4.6	5.5	4.6	100	100	100	100

Source: NESDB, Bangkok Metropolitan Region Study, unpublished report (Bangkok, 1985).

annually in recent years, creating a high demand for civil service posts. (For example, 43,000 persons applied for 80 positions in the Department of Public Welfare; 194,500 persons applied for 3,340 teaching positions in the Ministry of Education (The Economist Intelligence Unit, 1986b). In addition, there has been a marked slowdown in the migration of skilled and semi-skilled workers to the Middle East. Official estimates are that the number of Thai workers in that region have stabilized at about 240,000. The number leaving Thailand fell from 105,300 in 1981 to just under 70,000 in 1985, and the Government expects that total numbers will decline by about 7-10 per cent over the next several years (The Economist Intelligence Unit, 1986b). In the Sixth Plan, the Government reported that it would seek to lessen unemployment problems by accelerating the development of data and information systems on human resources and employment so as to improve human resources planning, by developing an employment information system and regional labour centres, by promoting both domestic and foreign labour markets, and by increasing vocational and technical education to accommodate the trends in labour market demand.

B. Urban land

Because approximately 80 per cent of land in the Bangkok Metropolitan Region (BMR) is private, Bangkok's process of urban development has been largely shaped by the imperfections of the private land market (Centre for Housing and Human Settlement Studies, 1985). Recent aerial photography has confirmed that there are large areas of vacant land within the urbanized area which are being withheld from development, resulting in an artificial scarcity. Indeed, there are 1,647 square kilometres of vacant land within and around the built-up area of the BMA. Based on an average gross residential density of 37.5 families per hectare, that vacant land could accommodate an additional 618,000 families, or a total of some of 3.1 million inhabitants (Centre for Housing and Human Settlement Studies, 1985). Another serious problem is that development companies have purchased large areas of agricultural land on the periphery of the BMA. The large betterment values - which in many instances have been due to improvements in accessibility resulting from public sector investments - have accrued to these developers, whereas the social costs of speculation (e.g., leapfrog development, longer commuting distances, higher commuting costs) have been passed on to the public (Kammeier, 1984).

In an attempt to improve the efficiency of the urban land market in Bangkok, efforts have been made to improve cadastral and land mapping capacity. To that end, the National Housing Authority (NHA) conducted a comparative land-use study in 1984/85. One phase of the study involved a land price survey on a 100-metre grid across the built-up area and

along the major roads; another examined trends in the land market between 1974 and 1984 in four sample areas, and a third studied changes in agricultural and residential land use during 1974-1984 by means of aerial photography.

In assessing a range of policy alternatives that might improve housing market efficiency in the BMR, a report prepared by the NHA for the Bangkok Metropolitan Region Study concluded that there were several ways in which the large number of vacant tracts in and around Bangkok could be reduced. The report suggested that land readjustment or land pooling could be adopted in peripheral areas where there was strong demand for housing sites (Centre for Housing and Human Settlement Studies, 1985). In the case of the proposed new towns, the Government could influence land use by establishing a differential pricing structure for various categories of land, thereby creating a type of internal cross subsidy. A third policy that was considered was the selective provision of infrastructure - in such a manner so as to guide private investment and encourage developers to comply with government policy. The report recommended that legislation (e.g., zoning laws, power of eminent domain) should be enacted to prevent the withholding of land from development and that taxes should be levied on vacant accessible land. The report further recommended that, given the large areas of vacant land suitable for housing development which had been identified by aerial photography, the Government should consider entering into negotiations for land swaps with private owners and developers.

C. Housing

In 1984, in response to the rapid changes taking place in the housing sector in Bangkok, the National Housing Authority (NHA) concluded that it would be useful to conduct a detailed study of changes in the housing stock. Because the 1970 Population and Housing Census tape was inadvertently destroyed by computer error, NHA decided to conduct the study by means of sequential aerial photography. Whereas the urbanized area of the BMR had been photographed by conventional aerial photography in 1974, in 1984 NHA undertook an experimental programme of small format aerial photography, using light planes and small hand-held cameras, and employing student volunteers to do the photo interpretation. By comparing various physical characteristics (e.g., spacing of rooftops), planners were able to chart the growth of and changes in the distribution of different types of housing categories (e.g., individual buildings, housing estates, shop-houses 5/, slum/squatter settlements, mini-slums, klong houses, and potential slum areas).

Analysis based on aerial photographs revealed that the housing stock in the BMA increased from 441,190 to 832,200 units during 1974-1984, an average annual increase of 6.4 per cent (Centre for Housing and Human Settlement Studies, 1985). The largest proportion of housing units, 43 per cent, consisted of individual buildings, including detached houses and shop-houses. The next largest proportion, 19 per cent, consisted of slum and squatter settlements, followed by housing projects built by private developers (15 per cent), public housing projects (9 per cent, two thirds of which were built by NHA, and one third by private developers), land-subdivision projects (6 per cent), and klong houses (3 per cent) (Centre for Housing and Human Settlement Studies, 1985). Although more than 200 slums were totally or partially cleared during 1974-1984, aerial photos revealed that the number of slum/squatter settlements in Bangkok had continued to increase - from 780 in 1974 to 1003 in 1984. The estimated population of those slum areas was 890,000 in 1974 and 1.1 million in 1984, implying that the number of slum dwellers increased at an average annual rate of 2.1 per cent (Centre for Housing and Human Settlement Studies, 1985).

There has been rapid growth of the private housing market in Bangkok in recent years. Although private developers did not enter the market until the late 1960s, they made rapid inroads, constructing a total of 122,490 units by 1984, compared to only 18,690 units up to 1974, an increase of more than 650 per cent (NHA, 1985). Beginning in the early 1980s, demand for middle-income housing, particularly in suburban areas, began to weaken because of rising construction costs, high land prices, high commuting costs, and lack of availability of housing finance. Housing finance is far from satisfactory; terms are relatively short and interest is very high - e.g., 17-18 per cent during 1985, about 7 per cent above the commercial banks' main deposit rate (Centre for Housing and Human Settlement Studies, 1985). To reduce construction costs, developers began constructing terraced housing (townhouses), shop-houses and condominiums. However, the market for such units, and particularly for units at the top end of the market, rapidly became over-built. 6/ As a result, developers are currently concentrating mainly on redevelopment and renewal of inner city areas (e.g., Pom Prap, Phra Nakohn and Samphan Thawong) located close to employment opportunities (Centre for Housing and Human Settlement Studies, 1985).

With respect to public housing, in response to growing deficits in the housing sector, the Government in 1973 amalgamated four existing public agencies to form the National Housing Authority (NHA). In the mid 1970s NHA began an ambitious five-year programme aimed at constructing 120,000 housing units, mainly in Bangkok (Kammeier, 1983). However, the programme encountered many problems. For one thing, largely because of its heavy subsidies, NHA accumulated a deficit of

$5.5 million by 1977 (Sivaramakrishnan and Green, 1985). In constructing the less expensive units, NHA absorbed all of the construction costs and interest greater than 6 per cent of the capital; for the larger units, it absorbed 50 per cent of construction costs and interest greater than 8 per cent (Sivaramakrishnan and Green, 1985). For another, the pace of construction was far too slow. Whereas there was a need for an estimated 300,000 units, NHA was able to build only around 6,000-7,000 units annually. Also, there were problems with the completed units. Specifically, the large multistorey apartment blocks were neither culturally acceptable nor financially within reach of the target groups. In fact, the illegal transfer of apartments for "key money" became a common practice (Kammeier, 1984). Finally, because of the poor quality of construction and lack of maintenance, many of the public housing complexes constructed during the late 1970s under the auspices of NHA are now classified by NHA itself as "potential slum areas."

Beginning in the late 1970s, partly because of the relative success of an experimental World Bank sites-and-services programme, NHA began shifting towards a slum upgrading and sites-and-services approach. The initial phase, which was designed to benefit 3,500 families, aimed at providing security of tenure and recovering costs through new user charges for electricity and water and increased rents (Sivaramakrishnan and Green, 1985). In a recent evaluation of its three major ongoing sites-and-services projects, NHA concluded that, although reasonably successful, the projects had not fulfilled all of their original objectives. For example, whereas the first sites-and-services project, located at Rangsit, was intended to be the basis for a new town, the lack of job opportunities in the area led to that aspect of the project being abandoned (Centre for Housing and Human Settlement Studies, 1985). Although development of the Bang Plee Bang Bo new town included development of an industrial estate, on-site employment was not generated as quickly as had been anticipated and residents continued to commute to Bangkok. Whereas Lad Krabang was expected to develop into an autonomous new town, NHA has acknowledged that by the time it is completed it will be engulfed by the spreading Bangkok Metropolitan Area. On the basis of these experiences, in selecting sites for low-income housing and sites-and-services during the Sixth Plan, NHA carefully weighed such factors as accessibility of the potential site to the CBD and various sub-centres, availability of employment, availability of public transport, the level of land prices, susceptibility of the site to flooding, potential for relocating slum dwellers, and prospects for development during the Sixth Plan period.

In preparing overall policy guidelines for the Sixth Plan, NHA has acknowledged that it has to move away from dependence on direct governmental subsidies and become self-financing (e.g., through such

measures as raising NHA rents and recovering costs from buyers or project beneficiaries), to co-operate with and provide greater assistance to the private sector in the production of low- to high-income housing, and to work more closely with domestic financial institutions such as the Government Housing Bank (GHB). Acknowledging that it will be able to provide housing for only a part of the total demand - perhaps one fifth of the 500,000 units needed in the BMR over the Sixth Plan period - NHA reports that its major strategies will continue to be slum upgrading (with an emphasis on preventing evictions from improved slums and incorporating cost recovery measures), sites-and-services (with a proposed annual target of 10,000 units), and pilot land development programmes (e.g., land pooling or perhaps land readjustment). It is expected that the private sector will remain responsible for the bulk of new housing production in Bangkok. NHA anticipates that, "with greater competition, improvement in bureacratic controls, and easier access to end-financing, there is reason to believe that developers will move down market and create a better match between their products and the effective demand of the market place." (Centre for Housing and Human Settlement Studies, 1985).

As a means of reducing the need for public sector intervention in the housing market, NESDB recommended the removal of constraints on private developers catering for low income households, together with complementary measures by the Government Housing Bank to expand housing finance. In regard to slum upgrading, it recommended that the programme remain of modest scale - with about 20,000 units to be upgraded during the Sixth Plan - until means of recovering costs were fully explored (National Economic and Social Development Board, 1986).

D. Water supply and environmental problems

Although there was an improvement in Bangkok's water supply following the approval of a World Bank loan to the Metropolitan Water Works Authority in 1974, the water supply situation remains less than satisfactory. As of 1980, 66 per cent of households in the BMA had piped inside drinking water, 8 per cent had piped outside water, 4 per cent obtained water from wells and 2 per cent from communal wells (National Statistical Office, 1982). The remaining 20 per cent of households obtained water from other sources. At least 100,000 persons are estimated to obtain water directly from canals and waterways that are grossly polluted by human waste and industrial effluents. Other problems in the water sector are the unreliability of supplies and a high degree of leakage.

Several ongoing or future capital projects - which will be entirely self-financing through user chargers - are expected to extend the availability of piped water to a larger population, reduce dependence on groundwater sources, and reduce system losses. The Third Bangkok Water Supply Project, which commenced in 1986 and is expected to be completed by 1990, will eliminate groundwater as a raw water source in critical subsidence areas, increase the population served by piped water by more than 1 million, upgrade plants, and rehabilitate pipelines (National Economic and Social Development Board, 1986). A subsequent Fourth Bangkok Water Supply Project would focus on the servicing of new areas.

One of the most serious challenges facing planners in Bangkok is extensive seasonal flooding. According to World Bank estimates, the average annual value of damages and losses suffered by households and commercial establishments in the central city has been about $30 million a year in recent years and up to $50 million in years of severe flooding. The lower Chao Phraya River Basin, in which Bangkok is located, is only 1.0-1.5 metres above sea level. The problem of slow storm-water runoff during the early part of the monsoon season is compounded by overflows from the river, in-flooding from up-country areas, and high spring tides in the Gulf. Because of the gradual obstruction of much of the city's natural drainage system, caused by the conversion of irrigation and drainage canals to roads and the filling in of other canals as part of the malaria eradication programme, the problem of seasonal flooding has worsened in recent years. Moreover, the vulnerability of large areas of the city to flooding has increased as a result of uncontrolled development in flood-prone areas and widespread subsidence of the land surface.

Because of overutilisation of groundwater in the Bangkok Metropolitan Area, as many as 1,000 square kilometres of land in the southern and eastern suburbs have been sinking by 5-10 centimetres per annum, a rate that is much faster than the rate at which Venice was sinking during its worst period (Kammeier, 1984). To tackle the problem of subsidence, the Government established a National Flood Protection Committee in 1983. To date, the committee has undertaken mainly emergency measures aimed at avoiding a repetition of the serious floods of 1983. It is estimated that a more permanent solution could take at least 10 years to implement. A groundwater licensing system has also been introduced to discourage use of groundwater when surface water supplies are available (National Economic and Social Development Board, 1986).

In support of the Government's flood control efforts, the World Bank extended a loan of $51.9 million to the Bangkok Metropolitan Administration (BMA) for expanding and improving flood protection and drainage infrastructure in a 90 square kilometre area in Bangkok's

central core. The basic approach to flood protection being employed in Bangkok is a polder system, which protects a given area by isolating it from high water levels in adjoining areas by means of natural or manmade barriers and by providing it with adequate internal drainage and storage capacity to deal with local rainfall and wastewater. The Bangkok project also involves large-scale diking and pumping, extension and improvement of the existing canal and drainage system, and construction of flood barriers (e.g., piled walling along the riverfront, raised roads, and retaining walls) in critically vulnerable areas.

Environmental conditions in Bangkok are generally poor. Only about 80 per cent of the 2,740 tons of solid waste generated daily is collected (World Bank, 1984); moreover, about one half of the amount that is collected is left to decompose. Bangkok has no water-borne sewerage system and relies mainly on pour-flush latrines and septic tank systems. Because effluent disposal occurs mainly via the surface water drainage system, canals and waterways are grossly polluted. Moreover, because of the large number of badly maintained motor vehicles, air pollution from faulty exhausts has exceeded tolerable levels, as defined by the World Health Organization. However, air quality levels in the central city have improved slightly since the conversion of the city's tuk-tuks (motorized rickshaws) to natural gas.

E. Power

At present, the energy supply situation in the Bangkok Metropolitan Region is satisfactory. Whereas only 66.9 per cent of households in the BMR had access to electricity in 1970, by 1980 electricity was available to almost everyone (99.8 per cent) (Centre for Housing and Human Settlement Studies, 1985). The outlook for the energy sector as a whole has improved significantly in recent years as a result of the decline in international oil prices, the country's lower-than-expected energy requirements (because of slower-than-anticipated economic growth), the discovery of domestic offshore gas supplies, and increasing possibilities for onshore gas and oil development. According to forecasts of Thailand's energy balance in the Sixth Plan, indigenous energy sources are expected to provide as much as 40 per cent of the country's needs by 1991. That contrasts with the situation in 1981 when domestic resources met only 11 per cent of total demand (World Bank, 1984). Currently, the natural gas is being mainly used to supply power stations in the Bangkok area. Although estimates of proven reserves in Thailand have recently been scaled downward, it is believed that there are major possibilities for utilizing natural gas, particularly for displacing other fuels.

A large measure of the energy conservation that has taken place in Thailand is a direct result of frequent and substantial increases in energy prices in recent years. During the 1970s, energy prices in Thailand were fairly low. Since 1978 the Government of Thailand has increased the domestic price of petroleum in response to international price developments, and Thailand now has domestic petroleum prices comparable to other countries in the region (World Bank, 1984). Recently, the Government imposed a 400-per-cent increase in the registration tax on vehicles using diesel fuel or liquid petroleum gas (LPG) and in the import tax on diesel engines. In addition, the annual road tax for new automobiles using diesel fuel or LPG will increase by 100 per cent annually over the next several years (The Economist Intelligence Unit, 1986).

F. Health and education

Bangkok's moderate levels of morbidity and mortality are considerably lower than those in the rest of Thailand. In 1975, the crude death rate in the BMA was estimated to be 4.3 per thousand, compared to 10.3 per thousand in the north, 10.0 in the north-east, 6.8 in the central region and 10.3 in the south. The infant mortality rate in Bangkok was also considerably lower: 31.0 per thousand live births, compared to 96.0 in the north, 54.4 in the north-east, 49.5 in the central region and 60.4 in the south. These regional disparities may be partly explained by the longstanding concentration of health care personnel and facilities in Bangkok (National Economic and Social Development Board, 1982).

The provision of family planning services has received high priority in Bangkok. The results of the 1980 population and housing census indicated that nearly 54 per cent of currently married women aged 15-49 in the Bangkok Metropolitan Area practised contraception, with the usage highest in the 25-39 age groups. As for the methods most frequently chosen, the oral pill ranked first, followed by tubal ligation and intra-uterine devices.

The Government seeks to increase the level of contraceptive use in Bangkok and in Thailand as a whole and to promote "beyond family planning" measures. The National Population Plan (1982-1986) outlined various measures: increasing the number of service outlets and mobile service points; encouraging the fullest participation of the private sector in extending family planning programmes; using the mass media to publicize the availability of family planning services; and promoting the use of permanent contraceptive methods. The Plan reported that a number of incentives and disincentives would be offered to promote family planning. They include reducing the tax rate of unmarried

persons in order to raise the age at marriage; requiring employers to provide family planning services as part of general health care services; allowing employees to be released from work in order to undergo sterilization operations; conferring payments or awards on persons who provided family planning services and who motivated others to accept family planning, or to undergo permanent sterilization; motivating couples to have no more than two children by conferring special benefits (e.g., scholarships, priority in public housing) or by imposing restrictions (e.g., allowing free deliveries only up to the second living child). The Plan noted that the Government would also seek to revise the criminal code in order to permit abortion in cases of contraceptive failure. With respect to information, education and communications activities, the Plan noted that population curricula were being developed for students in the primary grades through the university level. Moreover, non-formal out-of-school population education programmes were being developed for various target groups, including local leaders, slum families, minorities, workers, military conscripts and newlyweds (National Economic and Social Development Board, 1981).

The Government has also adopted a policy for special target groups, including the slum population of Bangkok, who have birth rates one and a half times higher than the national urban average (National Economic and Social Development Board, 1981). The policy involves promoting adult education and vocational training; establishing employment services and markets for goods; expanding public health and family planning services, nutrition education programmes, and day care and recreational facilities; improving environmental conditions; and promoting popular participation as a means of encouraging people to initiate their own solutions.

Thailand has long had a system of universal primary education. Bangkok has the largest number of primary schools per capita of any region in Thailand. It also has the country's major universities and technical schools. The pull of superior educational facilities in Bangkok is an important factor in influencing migration to Bangkok (see chapter I, section B). Although the Government has not formulated a policy to decentralize higher educational facilities at the national level, it has embarked on a policy of intra-regional decentralization. For example, Tamasat University is being moved to a peripheral location in order to help reduce the congestion resulting from the concentration of universities and other higher educational facilities in central areas of Bangkok.

G. Transport

Bangkok suffers from serious traffic congestion over wide areas of the city and for long periods of the day. Journey times are long and unpredictable. Traffic flows build up early in the morning, with traffic moving at an average of 14 kilometres per hour, continue at a stable level throughout the day, and reach their peak in the evening rush hour, when traffic moves at an average of only 13 kilometres per hour (National Economic and Social Development Board and Halcrow Fox Associates, 1985). According to the Metropolitan Bangkok Short-Term Urban Transport Review, conducted to clarify and resolve selected transport policy issues, congestion is as high as anywhere in the world, reaching levels at which many people modify their behaviour by changing trip destinations and time of travel, relocating, or not making the trip at all (National Economic and Social Development Board and Halcrow Fox Associates, 1985).

Traffic congestion in Bangkok reflects several interrelated problems. Partly because of relatively low fuel prices during the 1970s and low automobile taxes, Bangkok's level of private vehicle ownership is relatively high; according to the Short-Term Transport Review, in 1983 there were some 300,000 private automobiles and 391,000 motorcycles registered in the city. By 1991 NESDB predicts that there are likely to be 740,000 cars in the BMR, of which some 670,000 will be registered and used in Bangkok (National Economic and Social Development Board, 1986). Prior to the construction of the 29-kilometre First Stage Expressway System, there had been little investment in primary roads for many years. The privately built secondary and tertiary road networks were built up over the years with little planning and consist largely of narrow, winding and unconnected streets and cul-de-sacs. The road network is sparse in certain areas and the provision of distributor roads is very poor (National Economic and Social Development Board and Halcrow Fox Associates, 1985). Improvement of the road network has been severely hampered by the problem of land acquisition. The Bangkok Metropolitan Administration does not have compulsory powers of eminent domain, and there are numerous examples of missing links that have not been completed because of the inability of the authorities to acquire rights-of-way (National Economic and Social Development Board and Halcrow Fox Associates, 1985). Travel demand greatly exceeds the capacity of the road network. The Bangkok Short-Term Urban Transport Review concluded that a programme of traffic management might somewhat improve network capacity, but perhaps by only 5-10 per cent, much less than needed.

Bangkok's record of project implementation in the transport sector is mixed (National Economic and Social Development Board and Halcrow Fox Associates, 1985). The Bangkok Transportation Study (1975), the first

comprehensive study of the city's transport system, made several policy recommendations for long-term land use and transportation, including promotion of a pattern of polycentric urban development, creation of a single transport planning authority with budgetary powers, greater commitment to public transportation, and restraint of private vehicles, but none of these were implemented (National Economic and Social Development Board and Halcrow Fox Associates, 1985). Currently, the major thrust of the Government's policy for the transport sector is the construction of the Loop of the Second Stage Expressway System. Completion of the expressway is expected to result in significant improvements in the transportation network. However, by the end of the century, Bangkok will have to incorporate several million new inhabitants in distant, sprawling suburbs, and that will require the construction of extensive new secondary, distributor and access roads in addition to the expressway system. Moreover, as the Short-Term Urban Transport Review emphasized, the Government's decision to commit the bulk of its resources to an expressway strategy means that it will be at least 10 years before it will have another opportunity to make any strategic changes in transport policy. The Transport Review suggested that a more simple, cost-effective approach might be simply to encourage owners of private vehicles to use public transportation for trips to and within the central city. NESDB considered a more radical solution - setting up 20 toll gates in central areas of the city and collecting a toll (equivalent to $1.15, or about half the daily minimim wage) from every motorist entering the central zone during the hours of 6:30-18:00 (New York Times, 1986). Because of considerable public opposition, however, the proposal was not implemented.

Although Bangkok has high levels of private vehicle ownership, more than two thirds of daily person-trips, or about 5 million trips, are made by public transport. The Government-owned Bangkok Metropolitan Transit Authority (BMTA), which was created in 1976 through the consolidation of 22 private and two public bus companies, is the major passenger carrier, carrying 85 per cent of the total passenger load in its fleet of 4,000 buses. The bus fleet is old and in poor condition, with insufficient capacity to meet public demand without severe over-crowding. Partly because of government control of bus fares, which prevented BMTA from raising fares and establishing itself on a financially viable basis, BMTA has had operating losses of more than 2 million baht per day and is heavily in debt. In its search for means to reduce its operating losses, BMTA has explored possibilities for partial privatization - e.g., of activities such as construction of new depots and repair facilities (The Economist Intelligence Unit, 1986). Moreover, it recently decided to lease 1,200 new buses rather than undertake a planned large-scale re-equipment programme. Also, in February 1986 the Council of Economic Ministers approved a proposal to increase city bus fares, hopefully enabling BMTA to operate on a firmer financial footing.

In addition to the bus fleet operated by BMTA, there are 4,500 legal minibuses (2,200 of which operate on the main roads and 2,300 on feeder roads), and some 5,000-10,000 illegal minibuses (National Economic and Social Development Board and Halcrow Fox Associates, 1985). Although the number of vehicles is, in principle, controlled by vehicle licensing, there are many unofficial vehicles on the road. In an effort to improve traffic management, the municipal authorities have introduced over 100 kilometres of exclusive bus lanes. Whereas the with-flow lanes have been ineffective, mainly because of lack of enforcement, the contra-flow lanes have worked moderately well (National Economic and Social Development Board and Halcrow Fox Associates, 1985).

Bangkok is one of the largest cities in the world - outside China - that does not have some form of segregated mass transport (such as a metro or suburban rail line). In recent years there have been proposals to construct a light rail system. In addition, a segregated bus lane has been planned along the centre of each of the eight principal transportation corridors (two of which currently carry passenger flows of up to 15,000 persons per hour in one direction). The Government's most recent initiative is the so-called skytrain, an elevated highway that would be built over the existing highway to Don Muang airport. To date, a feasibility study has been conducted (The Economist Intelligence Unit, 1986).

In its Recommended Development Strategies and Investment Proposals for the Sixth Plan, NESDB outlined a number of priorities for the transportation sector. These included a major bus procurement programme, a network of segregated busways, improved buslanes and bus priorities, the gradual introduction of competitive tendering for route franchises, the elimination of all subsidies to BMTA in the future, and diversification of services to respond to the demands of different segments of the population (e.g., the provision of semi-express services at premium fares) (National Economic and Social Development Board, 1986). Acknowledging that rail mass transit was not affordable under present circumstances, NESDB reported that the BMR strategy should be to implement bus mass transit as an initial step. Preparations should be made, however, for a rail mass transit line to be implemented by the mid-1990s. Following completion of committed highway projects, NESDB recommended that priority should be given to construction of missing links in the road network and distributor roads.

V. RESOURCES AND MANAGEMENT

A. Public investment

Until recently, there was no effective mechanism for establishing investment priorities within the Bangkok Metropolitan Region, either across sectors or between areas. NESDB was theoretically in charge of assembling development plans and projects as well as capital programmes of all government agencies and examining them in the light of national plans. In reality, however, the board examined only the timing and costs of projects. The various sectoral agencies had a considerable degree of freedom in capital budgeting. However, there was no mechanism available for relating the activities of separate agencies or for co-ordinating their investment programmes.

In developing strategies and investment programmes for the BMR during the Sixth Plan, NESDB adopted a new approach. First, it examined groups of projects under a range of financing scenarios. Three representative investment packages, in which the main variable was the timing of implementation of various projects, were drawn up - at total capital costs over the Sixth Plan period of 38.2, 47.4, and 62.2 billion baht, respectively. The recommended investment package was the one of 38.2 billion baht. NESDB noted, however, that if economic circumstances changed and more investment became affordable, it would be possible to move from one investment package to another.

Individual projects were then prioritized according to a number of evaluation criteria, including the economic rate of return, capital cost (including foreign exchange component), cost and source of financing, impact on the urban poor, spatial and sectoral consistency, and the extent to which the projects resolved existing infrastructure shortages (National Economic and Social Development Board, 1986). Transport, water, and housing - areas where the BMR has its most visible problems - were determined to merit the bulk of new capital expenditure. Indeed, in the preferred investment strategy, transport accounts for 71 per cent of total investment during the Sixth Plan (with a breakdown of 48 per cent for roads, highways and bridges, 21 per cent for public transport and 3 per cent for other transport investments), water supply and flood control for 21 per cent, and public housing and slum upgrading for 8 per cent.

In terms of the spatial distribution of investment, NESDB proposed a core investment programme for each of the four strategic target areas. The investment strategy for the Central Business Area includes projects for improved public transport and construction of segregated busways, the Loop of the Second Stage Expressway, permanent flood protection works, slum upgrading, and middle income housing. In the

Rapidly Growing Suburban Area, which is projected to accommodate more half of BMR's population growth during the Sixth Plan period, the proposed core investment programme includes improvements to the suburban road network and public transport system, permanent flood protection, extension of the water supply, low income housing and slum improvement. In the Industrial area, investment will be in infrastructure to improve accessibility and provide piped water to industry and communities, and in low income housing. Finally, in the Outer BMR Area, investment will focus on the improvement of main roads and construction of distributor roads.

B. Resource generation

The BMA has few autonomous taxing powers. There are only four taxes under the direct jurisdiction of the Bangkok Administration: the house and land tax (a tax of 12.5 per cent on annual rent for houses and buildings used for commercial purposes); the land development tax (a tax on the assumed value of land, from which owner-occupied residential and agricultural land below specific sizes are fully or partially exempt); a tax on signboards; and the animal slaughter tax. Together, these local taxes have accounted for about 8 per cent of total municipal revenues in recent years. Another 15 per cent of total revenue has come from the surcharge of up to 10 per cent which local governments are allowed to add to certain national taxes - namely, the business tax (a tax on businesses at points of manufacturing and import), the beverage tax, entertainment tax, and gambling tax (Sivaramakrishnan and Green, 1985). A higher proportion of total revenue - averaging around 40-45 per cent during the late 1970s - derives from taxes on vehicles and rice exports which are levied by and shared with the central Government. The system of transfers of centrally raised revenues has evolved over time and is not standardized. Some transfers are made on the basis of origin of collection and therefore favour more affluent areas such as Bangkok. Other transfers have been allocated on a per capita basis. About 14 per cent of municipal revenue consists of local non-tax revenue - e.g., from fees and fines, property revenues, social services and miscellaneous fees, and the remainder is obtained from government grants.

Property values are a major area where a growing fiscal capacity in Bangkok has not been tapped. Although the substantial increases in land and property values in recent years have in many cases resulted from public investments (e.g., construction of highways, flood control projects), this "betterment" has not even been partially recaptured for governmental purposes. To remedy this problem, the Government, with financial assistance from the World Bank, is undertaking a $76 million land titling project. The project aims at producing up-to-date-maps on

a scale of 1:1,000 (the Bangkok Metropolitan Administration had been using cadastral maps that were some 40-60 years old), introducing new surveying technology, strengthening the Central Valuation Authority through technical assistance, and eliminating leakages in the current valuation system (Muncie, 1987). The photo maps will be sufficiently detailed so that no parcel of land will escape identification for taxation purposes (currently, it is estimated that one third to one half of the 1 million parcels in Bangkok are not linked to a property tax record (Muncie, 1987).

In discussing alternative development strategies and investment programmes for the Sixth Plan, NESDB put forth a strategy for improving the efficiency of tax collection and for widening the tax base. The strategy, not all elements of which will be feasible during the Sixth Plan, includes improving the collection of land development and house and land taxes by reassessing the standard land value in line with market value every four years; by levying a tax on owner-occupied dwellings that are currently exempt; by restructuring and adjusting vehicle registration fees more in line with the equity principle; and by allowing local authorities to set rates and collect their own revenues (National Economic and Social Development Board, 1986).

NESDB also emphasized that a key element in the strategy to mobilise additional financial resources should be the achievement of a greater degree of cost recovery, particularly because prices and charges for services in the BMR still reflected an era of abundant public finances. It recommended that state enterprises serving the BMR should impose charges that fully recovered recurrent expenses and debt service costs and provided some self-financing for expansion (National Economic and Social Development Board, 1986). A substantial proportion of new capital investment, e.g., in water supply, expressways, buses and new housing, was recommended to be financed through user charges. For flood protection, new property taxes were recommended to be levied on persons living in protected areas (National Economic and Social Development Board, 1986). Through such measures, NESDB believed it was possible that the cost-burden between central and local government, which had been about 65:35 during the Fifth Plan period, could be reversed significantly to 30:70, with the greater part of the additional financing coming from user charges.

C. The institutional context

Bangkok has a somewhat atypical administrative structure. Although the Bangkok Metropolitan Administration (BMA), created in 1972 following the merger of the municipalities of Bangkok and Thon Buri, was established as an ostensibly autonomous metropolitan authority, its

functions have been quite limited. It neither formulates plans for the metropolitan area - a task that is assigned to the Town and Country Planning Department of the Ministry of the Interior - nor has the authority to co-ordinate public investment with metropolitan development plans. The major responsibilities of the BMA are in the areas of sewerage and drainage, solid waste, construction and maintenance of local roads, public health and primary education. Many important municipal services are the responsibility of various state enterprises and central governmental agencies, including the Metropolitan Water Works Authority, the National Housing Authority, the Bangkok Mass Transit Authority, the Expressway and Rapid Transit Authority, the Industrial Estates Authority, and the Ministries of Education, Health, Industry, and Communications (Sivaramakrishnan and Green, 1985).

The role of the BMA and the functions of metropolitan government in general have been complicated by changing views about what type of municipal government there should be in Bangkok. Initially, the BMA Act of 1972 provided for a democratic form of government, consisting of a metropolitan assembly (with an equal number of elected and appointed members) and an elected governor. However, in 1978, the elective form of metropolitan government was abrogated by decree, and the governor and the assembly were appointed by the central Government. The governor was responsible to the Minister of the Interior; hence, for all practical purposes the BMA was an instrument of the Royal Thai Government rather than an autonomous or semi-autonomous metropolitan government (Sivaramakrishnan and Green, 1985). The Government of the BMA reverted back to a democratic form, following the election of a governor and assembly in November 1985. Although various changes in the structure of the Bangkok Metropolitan Administration have periodically been considered, including creation of a Ministry for the Capital Region and establishment of a Bangkok Council within the Ministry that would be empowered to co-ordinate public investment, no concrete steps have yet been taken.

In formulating development strategies and investment programmes for the Sixth Plan, NESDB concluded that institutional changes were required to strengthen inter-sectoral co-ordination and to enhance local government capabilities. This would involve the creation of a National Urban Development Board, which would provide the overall framework for public investment programming in the BMR, review and prioritize specific development proposals for inter-sectoral consistency and for consistency with the overall urban development strategy, and submit programme proposals for consideration by implementing agencies (National Economic and Social Development Board, 1986). It would also monitor urban development in all its facets, and evaluate the execution of strategies and policies. The board would consist of representatives from the various sectoral agencies, and from local government and the private sector, with NESDB serving as the secretariat.

In addition, because of the devolution of new areas of responsibility to the BMA during the Sixth Plan and the increasing complexity of its activities, it was recommended that the central Government should provide technical assistance and training to the BMA in such areas as resource mobilization, planning and development of distributor and access roads, traffic management, slum upgrading, flood protection and implementation of urban plans (National Economic and Social Development Board, 1986).

NESDB also put forth a strategy for increasing the participation of the private sector in BMR's development. The strategy involved increasing private sector participation in the provision of public services, e.g., roads and bridges, bus services in some areas, housing, water treatment plants, garbage and waste collection, and sewerage and drainage, by encouraging competitive bidding, granting concessions, and sub-contracting. It also recommended increasing the role of domestic financial institutions in public service provision, and using tax and financial measures, laws and regulations (including deregulation) to encourage private sector participation in such areas as low-cost housing, land readjustment, and urban renewal.

CONCLUSION

Already one of the world's most highly primate cities, Bangkok has the potential for significant population growth. Whereas there has been an impressive decline in natural increase, there is likely to be continuing in-migration to the Bangkok Metropolitan Area - particularly given the fact that the traditional surplus of agricultural land is finally running out, that Thailand has a relatively low overall level of urbanization, and that there is easy access from the rest of the country to Bangkok via a variety of low-fare transportation modes.

Over the past several decades the Government prepared various physical plans to control Bangkok's sprawling growth. However, despite the formulation of successive plans, none was ever officially approved (although aspects, e.g., the expressway system, were subsequently implemented). However, in Thailand as in many countries, the spatial but unintended impacts of macro and sectoral policies have dominated the direct impacts of spatial policies. These implicit spatial policies have included trade policies and development strategies (both import substitution and export promotion have strengthened Bangkok as the leading industrial centre and the only major port), agricultural pricing policies (food subsidies have driven large numbers of small rice farmers out of business), monetary and credit policies (these have had adverse impacts on the growth of small-scale enterprises), freight rate policies and fuel pricing. Almost all the implicit spatial policies have markedly reinforced primacy and the competitive advantage of Bangkok.

Beginning with the Greater Bangkok Plan 2000, which was prepared in conjunction with the Fourth National Development Plan, the Government advocated the promotion of a policentric pattern of national urban growth. This was partly because there was then a close correlation between poverty areas on the periphery and insurgency areas, a fact that was recognized explicitly in the Fourth Plan. In the Fifth Plan (and in the Sixth, which intends to carry out the uncompleted spatial agenda outlined in the Fifth Plan), the Government expressed a renewed commitment to reducing the dominance of Bangkok, largely as a means of promoting interregional equity. The chosen strategy - which seeks to promote satellite towns in the Central Region, to develop the Eastern Seaboard region, and to promote a number of cities on the periphery - not only takes advantage of natural decentralization forces within the Central Region, but also recognizes the importance of the private sector in locational decisions. However, it has encountered some difficulties. The Eastern Seaboard strategy, after being sidelined for many years, is only now getting under way. Moreover, the Government has encountered difficulties in attracting investment to peripheral areas, particularly in the north.

Whereas the Government has recently taken a number of concrete steps to decrease Bangkok's dominance (e.g., by reducing subsidies, promoting cost recovery), it will invest considerable sums in large infrastructure projects (e.g., construction of the expressway, expansion of the airport) during the Sixth Plan. So, too, some of the national development priorities in the Sixth Plan - such as strongly promoting the tourist sector, which is the country's major source of foreign exchange - will have powerful growth implications for Bangkok).

Among the developing country mega-cities, Bangkok provides one of the most successful examples of where the pace and pattern of metropolitan growth has been largely shaped by the actions of a dynamic private sector. This has fuelled the growth and performance of the metropolitan economy, although the cost in terms of external deseconomies (e.g., pollution, congestion, inappropriate land uses) has been quite high. The Government has recognized that it has been relatively impotent in the past to determine the pattern of metropolitan development and has accepted that its role should be more modest in the future. Hence, the Sixth Plan has placed considerable emphasis on privatization of activities and services previously involving the direct participation of the public sector, with the future role of Government stressing much more the control and regulation of the negative externalities associated with private sector development.

Notes

1/ The Bangkok Metropolitan Area (BMA), also known as Bangkok Metropolis or Bangkok-Thon Buri, is an area of 1,562.5 sq kms. Since 1972 the BMA has corresponded to the geographical area located within the boundaries of the Bangkok Metropolitan Administration, as well as to the census definition of the metropolitan area. Although the BMA includes large rural and semi-rural areas, it does not include parts of the urban area located within contiguous provinces.

2/ The Bangkok Metropolitan Region is an area of some 9,700 sq kms that consists of the Bangkok Metropolitan Area and the five surrounding provinces.

3/ Recent migrants are defined as persons over five years of age who changed their place of residence within the five years preceding the census; lifetime migrants are defined as persons who were born outside their changwat (province).

4/ The Central Business Area consists of old business districts - Phra Nakhon, Pom Prap Sattru Phai, and Samphan Thawong, covering an area of 9 sq kms - and new business districts - Pathum Wan, Bang Rak, Dusit, Phaya Thai, Thon Buri, Klong San, Bangkok Noi, Bangkok Yai and Yan Nava, covering an area of 138 sq kms. The Rapidly Growing Suburban Area, an area of approximately 1,065 sq kms that surrounds the Central Business Area, consists of the BMA districts of Phra Khanong, Bang Khen, Bang Kapi, Huai Khwang, Bang Khun Thian, Phasi Charoen, Taling Chan and Rat Burana, as well as Huang Nontha Buri, Pak Kret and Bang Kruai in the province of Nontha Buri. The Industrial Area, an area of 75 sq kms, includes old industrial areas in the districts of Huang Samut Prakarn, Pra Pradaeng and Bang Pli in Samut Prakarn province, as well as industrial growth areas in Huang Pathum Thani, Khlong Luang and Thanyaburi in Pathum Thani, Krathum Baen in Samut Sakorn and Sam Phran in Nakhon Pathom. The Outer BMR Area, which covers an area of 6,352 sq kms, includes: the BMA districts of Nong Khaem, Lat Krabang, Min Buri and Nong Chok; Lat Lum Koe, Sam Khok, Lum Luk Ka and Nang Sua in Pathum Thani; Bang Wa Thong, Bang Yai and Sai Noi in Nontha Buri; Bang Bo in Samut Prakarn; Kamphaeng Saen, San Len, Don Tom and Nakhon Chaisri in Nakhon Pathom; and Huang Samut Sakorn and San Phaeo in Samut Sakorn.

5/ Shop-houses are houses in which the ground floor is a commercial and the upper floor is usually a single-family residence. They are usually found bordering the main or secondary roads, often grouped to form small commercial/residential complexes.

6/ In the mid 1980s, some 58,000 shop-houses were reportedly unoccupied, including 36,000 units that remained unsold (Centre for Housing and Human Settlement Studies, 1985).

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