

KINGDOM OF THAILAND
MINISTRY OF AGRICULTURE AND COOPERATIVES
ROYAL IRRIGATION DEPARTMENT

THE EAST COAST WATER RESOURCES DEVELOPMENT PROJECT (PHASE II)

VOLUME 5-1

SECTORAL REPORT

- I SOCIO-ECONOMY
- II AGRICULTURE DEVELOPMENT PLAN
- III IRRIGATION DEVELOPMENT PLAN
- IV DOMESTIC AND INDUSTRIAL WATER DEMAND

APRIL 1984

DEVELOPMENT AND IRRIGATION DIVISION, BANGKOK



KINGDOM OF THAILAND
MINISTRY OF AGRICULTURE AND COOPERATIVES
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ABBREVIATIONS AND LOCAL TERMS

A. ABBREVIATION OF MEASURES

(1) Length

mm = millimetre
 cm = centimetre
 m = metre
 km = kilometre

(2) Area

m² = square metre
 ha = hectare = 10⁴ m²
 km² = square kilometre = 10⁶ m²
 rai = 0.16 ha

(3) Volume

lit, l = litre = 1,000 cm³
 kl = kilolitre = 1 m³
 m³ = cubic metres
 MCM = million cubic metres
 = 1,000,000 m³

(4) Weight

mg = milligramme
 g = gramme
 kg = kilogramme
 t = ton = 1,000 kg
 qwt = quintal = 100 kg

(5) Time

s = second
 min = minute
 h = hour
 d = day
 yr = year

(6) Money

฿ = Baht (unit of Thai currency)
 US\$ 1 = ฿ 23.0)
 \$ = US dollar
 ¥ = Japanese Yen

(7) Electric Measures

kV = kilovolt
 kW = kilowatt
 MW = megawatt = 1,000 kW
 kWh = kilowatt hour
 kVA = kilovolt Ampere

(8) Other Measures

mmho = micromho = conductance
 ppm = parts per million
 ppb = parts per billion
 % = per cent
 LCD = litre per capita
 per day
 PS = 0.736 kW
 pH = scale for acidity
 ° = degree
 ' = minute
 " = second
 °C = degree centigrade
 10³ = thousand
 10⁶ = million
 10⁹ = billion (milliard)

(9) Derived Measures Based on the Same Symbols

m³/s = cubic metre per second
 ton/ha = ton per hectare
 10⁶ m³/yr, MCM/yr
 = million cubic meter
 per year

B. OTHER ABBREVIATIONS

GDP = gross domestic product
 GRP = gross regional product
 El. = elevation
 HWS = high water surface
 SD = sanitary district
 DA = development area
 ESS = Eastern Seaboard Study
 FOB = free on board
 CIF = cost, insurance and
 freight
 WHO = World Health Organization

C. ABBREVIATION OF ORGANIZATIONS

MOAC	Ministry of Agriculture and Cooperatives
RID	Royal Irrigation Department
DOF	Department of Fisheries
LDD	Land Development Department
NESDB	National Economic and Social Development Board
NEB	National Environment Board
NSO	National Statistical Office
MOI	Ministry of Industry
DMR	Department of Mineral Resources
DIW	Department of Industrial Works
MOC	Ministry of Communications
HD	Harbor Department
DHW	Department of Highways
DOH	Department of Health
RTN	Royal Thai Navy
PWWA	Public Water Works Authority
MD	Meteorology Department
DOLA	Department of Local Administration
TAT	Tourism Authority of Thailand

D. LOCAL TERMS

Changwat	:	Province
Amphoe	:	District (Township)
Tambon	:	Township (Town)
Muban	:	Village
Muang	:	Administrative Center of Province
King Amphoe	:	Sub-district
Mae Nam	:	River
Khwae	:	Main tributary of a river
Huai	:	Stream, creek or small tributary
Khlong	:	Canal
Khao	:	Mountain

SECTORAL REPORT I
SOCIO-ECONOMY

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1. INTRODUCTION

The objectives of the socio-economic study are as follows:

- (i) to reveal the present situation of socio-economy both in the whole Thailand and in the Study Area,
- (ii) to explain the development policy and to review the established socio-economic development plans in the Study Area,
- (iii) to project the socio-economic framework in the Study Area up to the Target Year 2001.

Chapter 2 describes socio-economy at present and clarifies socio-economic characteristics both in the whole Thailand and in Chon Buri and Rayong Provinces in which the Study Area is included. The following items at national and provincial level are included in the description:

- (1) Population,
- (2) Gross Domestic Product (GDP) and Gross Regional Product (GRP),
- (3) Foreign trade,
- (4) Employment,
- (5) Agricultural and manufacturing activities,
- (6) Standard of living.

National Socio-economic Development Plan and regional development plans are presented in Chapter 3. Chapter 3 also includes population projection for the years of 1986, 1991, 1996 and 2001.

The socio-economic study neither covers all aspects of socio-economy of Thailand nor includes any proposal for planning. It aims to provide the other relevant sectoral studies with the basic data and information.

2. SOCIO-ECONOMY UNDER PRESENT CONDITIONS

2.1 Socio-Economy of Thailand

2.1.1 Population

With regard to population in Thailand, two different statistics are available. The NSO issues "Population and Housing Census" once in 10 years. This document contains various statistic data other than population size. The DOLA publishes "Registered Population" every year, but it includes less statistic records compared to "Population and Housing Census". The socio-economy of Thailand described herein refers to "Population and Housing Census" published in 1970 and 1980.

The population and its regional distribution is shown in Table 1. The population of the whole Thailand is $44,278 \times 10^3$ in 1980 and its average growth rate is 2.56 % per annum for the period from 1970 to 1980. The majority of the population are concentrated in the Central and North-eastern regions, being $29,749 \times 10^3$ or 67.2 % of the whole population in 1980; both regions occupy approximately 53.2 % of the entire territory. The average population growth rate ranges from 1.79 % per annum in the Northern region to 3.02 % per annum in the Central region.

The population density in 1980 is 86.3 persons/km² for the whole Thailand, ranging from 137.5 in the Central region to 52.7 in the Northern region. Table 2 presents the population density in 1970 and 1980.

Population distribution between municipal and non-municipal areas is shown in Table 3. The non-municipal population in 1980 is $36,631 \times 10^3$, corresponding to 82.7 % of the total population. On the other hand, the municipal population is $7,647 \times 10^3$, occupying 17.3 % of the total population. In municipal area, the population of Bangkok Metropolis is $4,711 \times 10^3$, which is 10.7 % of the total population and is 61.6 % of the municipal population. The municipal population, especially the population of Bangkok Metropolis, has been increasing remarkably. The annual population growth rate in Bangkok Metropolis is 6.56 % for the period from 1970 to 1980, while the same in municipal area excluding Bangkok Metropolis and in non-municipal area are 3.62 % and 2.07 % respectively.

The age distribution of population is shown in Table 4 and Fig. 2. The distribution pattern has changed into the spindle shape from pyramid shape. This reflects the decrease of population growth rate in the last 10 years.

The number of households is $8,422 \times 10^3$ in 1980. The average population per household is 5.3 in 1980, while the figure is 5.8 in 1970 as shown below.

	1970	1980
Number of Households (10^3)	5,940	8,422
Average Population per Household	5.8	5.3

Data Source: NSO

2.1.2 Gross Domestic Product (GDP)

The scale and characteristics of GDP in Thailand for the year 1981 are tabulated below.

Sector	Value ^{/1} (฿ 10^6)	share (%)	Growth Rate ^{/2} (%)
Agriculture	76,235	24.2	3.43
Manufacturing	87,838	27.9	9.73
Services	151,043	47.9	8.41

^{/1} 1972 constant price

^{/2} Average annual growth rate for the period from 1976 to 1981

Data Source: NESDB

GDP of Thailand is $\text{฿ } 315,116 \times 10^6$ in 1981. The annual growth rates are 9.5 % for a 5-year period from 1971 to 1976 and 7.4 % for a 5-year period from 1976 to 1981. Per capita GDP grows to $\text{฿ } 6,636$ in 1981. The annual growth rate of per capita GDP declines also from 7.3 % in the early half of 1970s to 5.3 % in the latter half as shown below.

	Year ^{/1}			Annual Growth Rate (%)	
	1971	1976	1981	1971-1976	1976-1981
GDP ^{/1} (₦ 10 ⁶)	140,112	220,450	315,116	9.49	7.41
Per capita GDP (₦)	3,602	5,116	6,636	7.27	5.34

^{/1} 1972 constant price

Data Source: NESDB

The manufacturing sector shares 27.9 % of GDP in 1981. The agricultural sector follows the manufacturing sector with 24.2 %. The annual growth rate in manufacturing sector registers 9.7 % from 1976 to 1981, exceeding the growth rate of the agricultural sector, which shows as low as 3.4 %. The crop production is predominant in the agricultural sector, sharing 75.4 %. Among the crops, paddy indicates the highest percentage of 39.3 %, followed by fruits (17.1 %), cassava (9.8 %) and sugarcane (6.2 %). But the annual growth rate of paddy remains as low as 2.9 % for the last 5-year period from 1976 to 1981. The sugarcane records the negative growth rate as shown in Table 5.

In the manufacturing sector, "food and beverages" takes the first rank with 31.3 % in the sharing ratio, followed by "textile and wearing apparel" (23.7 %) and "basic metal, metal and machinery" (15.6 %). A category of basic metal, metal and machinery attains the highest growth rate (6.54 % per annum), whereas the "wood and wood products" records the negative growth rate. The details of GDP in manufacturing sector are shown in Table 6.

2.1.3 Foreign Trade

The foreign trade balance is presented in Table 7 for the period from 1971 to 1981. The trade balance records deficits throughout the period. The deficits have been increasing for the recent five years and reached ₦ 63,712 million equivalent, corresponding to 8.1 % of GNP. The value of exports grows at 24.4 % per annum on the average during the period from

1971 to 1981, while the value of imports shows 23.3 % in the growth rate for the same period.

The exports amounts to $\text{¥ } 153,030 \times 10^6$ equivalent in terms of F.O.B. Bangkok value in 1981. The major export commodities of Thailand comprise rice, rubber, maize, tapioca products, prawn, tin, sugar and textile products. The export value of these eight major commodities amounts to $\text{¥ } 94,983 \times 10^6$ equivalent as shown in Table 8 and occupies 62.1 % of the total export value.

Rice plays an important role in foreign trade balance. As shown in Table 9, in 1981 approximately $3,036 \times 10^3$ tons of rice are exported and it earns the foreign currency equivalent to $\text{¥ } 26,364 \times 10^6$ which corresponds to 17.2 % of the total export value.

The imports in 1981 amounts to $\text{¥ } 216,742 \times 10^6$ equivalent in terms of C.I.F. Bangkok value, of which $\text{¥ } 65,061 \times 10^6$ equivalent or 30.0 % is accrued by fuel and lubricants. The amount of fuel and lubricants nearly coincides with the deficit in the foreign trade.

2.1.4 Employment

Labour force, employed and unemployed population and unemployment ratio described herein are based on the "Planning of Labour Force, Employment and Unemployment, 1970-1980" prepared by Population and Manpower Planning Division, NESDB. The labour force, unemployment ratio and their annual increasing rates are shown in Tables 10 and 11. The unemployment ratio has been increasing year after year and reached 1.17 % in 1980, being 5.6 times larger than the figure in 1971.

Table 12 shows the distribution of population by economic activity in 1970 and 1980 based on the Population Census published by NSO. The proportion of the economically active population in 1980 decreases by 9 % compared with the figure in 1970, due to reduction in proportion of "waiting for farm season". However the number of the economically active population has actually increased, since the total population has increased as large as 29 % during the same period. As discussed in the preceding Section 2.1.1, population has been tending to concentrate in

municipal areas. These facts imply that today the role of agriculture in employment adjustment is becoming less important and demands for employment opportunities in municipal areas are increasing, which is connected with the increasing tendency in an unemployment ratio apart from the absolute value of it.

The distribution of economically active population in employment by sector is shown in Table 13. In 1980 approximately 73 % of the employment relies on agriculture and its related activities. The employment in the manufacturing and service sectors tends to increase, whereas that in the agricultural sector reduces gradually. The highest annual growth rate is recorded by manufacturing sector, 5.4 %/year.

2.2 Socio-Economy of Study Area

2.2.1 Administrative Division

The Study Area encompasses a vast area of approximately 5,430 km² and covers the Chon Buri and Rayong provinces, excepting the Prasae river basin. Out of the entire area, approximately 3,800 km² falls into the Chon Buri province, corresponding to 88 % of the total area of the province (4,363 km²). The rest of the area commands approximately 47 % of the entire Rayong province (3,552 km²). Such being the case, the socio-economic situation of the Study Area is deemed to be represented by that of the whole of the Chon Buri and Rayong Provinces. An integration of the Chon Buri and Rayong Provinces is hereinafter referred to as "Region" for the convenience of the study.

The administrative division of the Region is illustrated in Fig. 3 and is presented in detail in Table 14. The summary is given hereunder.

Provinces	Nos. of Districts /Sub-districts	Nos. of Townships	Nos. of Villages
Chon Buri	10	83	609
Rayong	6	44	248

The above administrative organizations are under the central government.

Apart from the administrative division, there exist two administrative organs, namely municipality and sanitary district. Their administrative activity is separated from the government administration and is managed individually like a local government. The municipality or sanitary district is generally located within one district/sub-district, but this boundaries are not necessarily coincident with those of the district/sub-district. There are 4 municipalities and 16 sanitary districts in the Chon Buri Province and 2 municipalities and 8 sanitary districts in the Rayong Province. Fig. 4 and Table 15 present the municipalities and sanitary districts in the Region.

2.2.2 Population

The population of the Region is $1,103 \times 10^3$ in 1981, consisting of 738×10^3 in the Chon Buri Province and 365×10^3 in the Rayong Province, according to the Registered Population published by DOLA. Table 16 shows the historic population and the population growth rate. The population growth rate shows a remarkable variation between the periods. During a 5-year period from 1971 to 1976, it was 3.53 % per annum, indicating 1.5 % higher value than that during a 5-year period from 1976 to 1981. The growth rate shows only slight difference between the two provinces in the Region. For the period from 1971 to 1976, abnormal high growth rate of 5.0 % per annum occurs in the Rayon Province, resulted from transmigration from the outside of the territory.

The population distribution in the Region is mentioned below and is shown in Table 17 and Fig. 5. The Region has six municipalities; four municipalities in the Chon Buri Province and two in Rayong Province. These six municipal areas are populated by 173×10^3 , corresponding to 15.6 % of the total population. The rest of population, 933×10^3 or 84.4 % of the total is spread over the non-municipal area.

The population density over the Region is 139.4 persons/km² in 1981, ranging from 169.1 persons/km² in the Chon Buri Province to 102.8 persons/km² in the Rayong Province as shown in Table 18. The figure is nearly the same with that of the Central region and is approximately 1.4 times of that of the whole Thailand. There is a clear distinction in population density between the municipal area and the non-municipal area.

The population density is more than 1,000 persons/km² in the municipal areas and only 60 persons/km² in non-municipal area. It is noteworthy that the population density in Chon Buri municipality is exceeding 10,000 persons/km².

The population size of municipal areas had grown at the average rate of 10.3 % per annum during the period from 1976 to 1981. This rapid increase is mainly due to establishment of new municipalities; Muang Pattaya in the Chon Buri Province and Thang Kwian in the Rayong Province.

2.2.3 Gross Regional Product (GRP)

The characteristics of GRP in the Region are discussed hereunder. GRP at 1972 constant price level is summarized in Table 19 for 1973, 1976 and 1981.

In 1981, GRP of the Region is $\text{฿ } 14,999 \times 10^6$, which accounts for 4.8 % of GDP. It grows at the average annual rate of 9.3 % during the period from 1976 to 1981, which is higher than the national average of 7.4 %. Per capita GRP in the Region is $\text{฿ } 13,599$ in 1981, which is more than twice as much as per capita GDP.

The share of the Chon Buri Province in GRP of the Region is 79.1 %, while that of the Rayong Province is only 20.9 % in 1981. On the other hand, per capita GRP of the Chon Buri Province in 1981 is $\text{฿ } 16,072$, whereas that of Rayong is $\text{฿ } 8,593$. These facts reveal that the economic activity of the Chon Buri Province is incomparably superior to that of the Rayong Province. The development of the Rayong Province would be essentially needed to be accelerated to avoid socio-economic unbalance within the Region. GRP of the Region is, in general, increasing with a relatively high rate 9.3 % per annum. Its increasing rate exceeds that of the national level by 2 %.

The structure of GRP of the Chon Buri Province is quite different from that of the Rayong Province. In the Chon Buri Province, manufacturing sector including mining and construction, is the leading sector with 48.4 % of sharing ratio against the gross. On the other hand, in the

Rayong Province, approximately 55 % of GDP is generated by agricultural sector. Among annual growth rates of sectoral GRP from 1976 to 1981, the agricultural sector in the Rayong province (11.2 %) and the manufacturing sector in the Chon Buri Province (9.6 %) are the highest two sectors, which are simultaneously the leading sectors in each province as mentioned above. Details of GRP by sector are summarized in Table 20.

Agriculture plays an important role in the socio-economy of the Region. As shown in Table 20, the agriculture sector occupies approximately 30 % of GRP and the majority population depend on agriculture and its related activity for their livelihood.

Table 21 shows the agricultural land use of the Region. Out of the entire area of the Region (7,915 km²), 4,891 km² or 62 % have been developed for farming. A category of "under field crops" extends over 3,376 km², corresponding to 69 % of the cultivation area or 43 % of the entire area. The extent of "paddy land" is only 19 % of the cultivation area. Compared with the land use of the whole Thailand, the rate of "under field crops" shows three times larger and contrarily the rate of "paddy land" is 70 % smaller. The average farm size is 6.7 ha in the Region, while the same is 4.3 ha for the whole Thailand.

Major crops are sugarcane and cassava. In 1980 these crops are grown in 2,947 km², being 60 % of the entire cultivation area. The productions of sugarcane and cassava are 3,261 x 10³ ton and 3,211 x 10³ ton, respectively, in 1980. Their proportions against the whole Thailand are 16.4 % and 19.4 %, respectively.

Table 22 to 24 shows the planted area, production and yield of paddy, sugarcane and cassava during a 6-year period from 1975 to 1980. As is clear from tables, increase in production is evidently due to expansion of the planted area. The yield increase is stagnant, due to lack of agricultural input such as fertilizer, insecticide etc. and irrigation. Reduction in production in 1979 is attributable to severe drought. The improvement of agricultural support services and development of irrigation facilities have to be realized in order to increase the yield and to stabilize the livelihood of farmers.

The manufacturing ranks first in GRP with 42.3 % of sharing ratio in 1981 and is increasing at 9.6 % per annum. Agro-processing and textile are main activities. Majority of factories are run on a small scale; number of factories employing more than 100 persons is only 1.5 % of the total as shown in Table 26. The manufacturing activity mainly concentrates in the Chon Buri Province.

Tourism industry is one of significant economic activities in Thailand. As shown in Table 27, visitors to Thailand number $2,016 \times 10^3$ in 1981 and has increased at 12.9 % of the average annual growth rate. The expenditures of visitors amounts to $\text{฿ } 21,455 \times 10^6$ equivalent in 1981, being 14 % of the total exported value. The Study Area embraces Pattaya, a famous beach resort. The number of arrivals in Pattaya is 569×10^3 in 1980, out of which 406×10^3 , or 71.3 % are international arrivals. Approximately 22 % of visitors to Thailand pay visit to Pattaya.

The productivity is obtained by dividing GRP by the number of the employed population and is presented in Table 28. The productivity varies largely from $\text{฿ } 34.6 \times 10^3$ per person in the Chon Buri Province and $\text{฿ } 17.1 \times 10^3$ per person in the Rayong province. Such large difference is attributable mainly to the productivity in the manufacturing sector. The average productivity over the Region is $\text{฿ } 28.5 \times 10^3$ per person.

2.2.4 Employment

The employment situations of the Region are solely referred to the Population Census published by NSO, since no other adequate data are available. Table 29 presents the distribution of population by economic activity for the Region.

The share of economically active population of the Region is 67.3 % in 1980 and is somewhat higher than that of the whole Thailand (65.8 %). The figure in the Chon Buri Province (64.8 %) is as much as that of the whole Thailand, while the share in the Rayong Province (72.6 %) is remarkably high. The high figure in the Rayong Province is most probably resulted from a large employment in agriculture and its related activities.

In municipal area, the share of student and house-wife population (29.2 %) is higher than in other area (22.9 %). Consequently, the share of economically active population in municipal area (60.1 %) is lower than in other area (68.5 %). Assuming that a category of "looking for works" should be rated as unemployment, the unemployment ratio in the Region is computed at 3.4 %, which is almost the same level as that of whole Thailand (3.3 %). The unemployment ratio of the Chon Buri Province (3.7 %) is higher than that of the Rayong province (1.9 %). The unemployment ratio in the municipal area (4.2 %) is a little higher than that of other area (2.9 %).

The employment situation is shown in Table 30. The total employment reaches 492×10^3 in 1980 in the Region. The agricultural sector takes 300×10^3 people into employment, approximately 61.1 % of the total employment. The employment in the manufacturing sector remains as low as 11.8 % in proportion or 58×10^3 people. The average annual growth rate of employment is 2.9 %, showing a little higher value than the population increasing rate (2.7 %). The growth rate in the manufacturing sector indicates 5.5 % per year, which is far from that of the agricultural sector (2.1 %). The characteristics of the employment situation in 1980 are summarized hereunder for the Chon Buri and Rayong Provinces.

Sector	Employment Rate (%) ^{/1}		
	Chon Buri	Rayong	Region
Agriculture	54.2	78.9	69.1
Manufacturing	13.7	8.2	11.8
Services	32.1	17.9	27.1

^{/1} Situation in 1980

Table 31 shows the distribution of the employment by sector and area for 1980. The rural area has the highest share of 77.0 % in the agricultural sector. In the manufacturing sector, the municipal area and the sanitary district recorded nearly the same level of shares, 21.8 % and

18.2 %, respectively. In the services sector, the share in the municipal area (69.0 %) is higher than that in the sanitary district (43.3 %).

2.2.5 Standard of Living

The indicators of level of living in this study were adopted from the data on quality of living quarters and ownership of selected equipments, obtained from the Housing Census prepared by NSO. Tables 32 to 34 show the standard of living in the Chon Buri Province and the Rayong Province.

The data reveal that households using pipe water are 64.7 % in the municipal and 14.8 % in the non-municipal areas, 21.9 % on an average. The dependence on private well is higher in the Rayong province (81.0 %) than in the Chon Buri Province (55.0 %) and also higher for the purpose of water supply (63.8 %) than for the purpose of drinking water (45.8 %).

In the municipal area approximately 94 % uses the electric lighting, whereas in the non-municipal area approximately 53 % is provided with the electric lighting. As to the bathroom, a rate of furnishment is approximately 91 % in the municipal area and 64 % in the non-municipal area. If the flush toilets and moulded bucket latrine are considered sanitary toilets, diffusion rate of the sanitary toilet is 92.3 % in the municipal area and 64.3 % in the non-municipal area.

More or less 90 % of households holds radio sets. Other equipments largely used by households in the municipal area are the electrical appliances such as televisions, refrigerators, and electric fans (63.8 %, 48.8 % and 83.0 %, respectively) and those largely used by households in the non-municipals area are private transportation media such as bicycles and motor-cycles (55.5 % and 40.3 % respectively).

3. SOCIO-ECONOMIC DEVELOPMENT PLAN

3.1 Socio-Economic Development of Thailand

3.1.1 Fifth National Economic and Social Development Plan

The Government of Thailand initiated the First National Economic and Social Development Plan in 1961. Since then the Government has been implementing consecutively National Economic and Social Development Plan during the last 20 years as the national framework for economic and national development policies. The Fifth National Economic and Social Development Plan, 1982-1986, (the Fifth Plan) was come into effect from 1st October, 1981. The Fifth Plan was prepared reflecting the performance of the five-year plans during the last 20 years. As far as the socio-economy is concerned, the Fifth Plan envisages the following issues.

(1) Deterioration of the country's economic and financial situation

The economic and financial situation in Thailand has deteriorated because of over-spending which has led to increase the deficits in foreign trade and budget.

(2) Deterioration of the country's natural resource base and socio-economic environment

The expansion of cultivated land in all regions without proper natural conservation has brought about depletion of land, water forest and mineral resources. The excessive concentration of economic activities into the Bangkok Metropolis has risen the urban congestion and caused environmental deterioration.

(3) Social problems

The rapid economic growth has caused social problems related to culture, social value, mental well beings, drugs and safety of lives and property.

(4) Poverty in backward rural areas

Only a fraction of the rural people benefited from development, but others have benefited very little and are still helplessly living under absolute poverty in the rural area.

To solve the above-mentioned socio-economic problems, the Fifth Plan mainly stresses "economic progress with national harmony" and aims at attaining the objectives explained hereunder.

(1) Restoration of the country's economic and social position

To restore the economic and social position in Thailand, the maximum levels of trade and budget deficits have been determined and three important fiscal and monetary policies have been stipulated. These policies are as follows:

- . Mobilization of more savings for both the public and private sectors,
- . To build a national economic and financial discipline in both the public and private sectors,
- . To increase economic efficiency and productivity to expand export capability.

(2) To adjust economic structure and to improve economic efficiency

To cope with the world economic changes and simultaneously to disperse economic activities to the rural area, the Fifth Plan has formulated objectives to restructure key productive sectors and increase economic efficiency, particularly in agriculture and the use of natural resources to yield higher returns.

In agriculture, the promotion of production pattern consistent with exports and domestic consumption is emphasized to achieve higher productivity.

In manufacturing, the main objectives are to increase the efficiency of industries including their role as a foreign exchange earner and to disperse industrial activities to provincial areas, particularly to the area along the Eastern Seaboard.

(3) Development of social structure and distribution of social services

It is necessary to improve the social structure in line with economic changes. It is stressed that the population growth rate will

be lowered and social services such as education, health and justice will be provided and distributed more adequately to the rural area.

(4) Poverty alleviation in backward area

This programme is aimed at the alleviation of rural poverty and is also aimed at preconditions which will lead to the target of an "adequate living standard".

(5) Coordination of economic development activities with national security management

(6) Reformation of the national development administration system and deconcentration of ownership pattern

Table 35 shows the economic targets of the Fifth Plan. The targets of annual growth rate are 6.6 %, 4.5 %, and 7.6 % for GDP as a whole, agricultural and manufacturing sectors respectively. On the population growth rate, it is anticipated that it will be lowered to 1.5 % per annum by 1986.

3.1.2 Agriculture Development Policy

Agriculture is the backbone of the economy in Thailand. It sustains the self-sufficiency of staple food and the employment absorption. The agriculture sector makes also a great contribution in foreign trade; share of agricultural exports accounts for 52 % of the total export in 1980.

Major exportable crops are rice, rubber, maize, cassava and sugarcane. These five crops occupy about 65 % of total value of agriculture production in 1981 and share about 47 % of total value of exported agriculture products in 1981.

The crop production has been steadily increased during the Third and Fourth Plans at the average annual growth rate of 8 %. This increase is mainly attributable to an expansion of the planted area. The planted areas of upland crops, oil crops, perennial crops and paddy have increased at the rate of 15.3 %, 40.0 %, 16.2 % and 3.4 % per annum, respectively

during the abovesaid period. However, an increase in crop yield has been stagnated as low as 1.96 % per annum on an overall average during the Fourth Plan.

The under-mentioned overall targets and supporting policy measures have been set forth in respect to the agriculture, in order to accomplish the short-run objectives of a rapid economic recovery and a greater degree of economic stability stipulated in the Fifth Plan.

(1) To attain the target of about 7 % increase in GDP, the value in agricultural sector is projected as,

- 1) Overall target: annual increase by 4.5 %
- 2) Crop production: annual increase by 4.7 %
- 3) Livestock production: annual increase by 4.2 %
- 4) Fisheries production: annual increase by 5.4 %
- 5) Forestry production: annual increase by 0.3 %

(2) The Government will put more emphasis on the conservation of forest and watershed. The forests and national park, totalling about 10.4 million ha, should be carefully conserved by proper rehabilitation work. Furthermore, the reforestation should be implemented at the rate of about 48,000 ha per annum to manage better watershed. Hence, expansion of farmland will be limited over the 5-years period. In this connection, the strategy for agricultural development has to emphasize structural improvement within the sector: production increase through crop intensification and further agricultural diversification will be promoted.

(3) In order to raise productivity of agriculture, the priority is given to development of irrigation system and expansion of on-farm facilities as well as water resources development. In addition, emphasis is placed on soil improvement and strengthening the agricultural support services.

3.2 Socio-Economic Development of Region

3.2.1 Development Policy

As mentioned before, the Fifth Plan stresses the adjustment of "economic structure" rather than "economic growth". The Fifth Plan expects the Region to play an important role in this strategy. On the other hand, the Region has some subjects of its own, particularly in agriculture, which concentrates into cash crops, such as cassava and sugarcane.

Under these circumstances, the development policy of the Region will be led to the following two points:

(1) Development as a new growth center

The Region has a number of locational advantages as follows: not very far from Bangkok, close to the Gulf of Thailand and gateway to the Northeast region which supplies Bangkok with various raw materials and labours. Based on these locational advantages, the Region will be developed as a new growth center by industrial development and creation of employment opportunities. With regard to Chon Buri, it is identified in the Fifth Plan as one of five nuclei in the regional urbanization. Efforts will be made to develop the urban system in Chon Buri, linked with the development in Rayong which is low-order center in the Region.

(2) Improvement of agricultural structure

In the Region, more than 60 % of employment depends on agriculture. Therefore the improvement of agricultural structure will be also important.

Efforts will be made to restructure the agricultural production process from "extensive agriculture" to "intensive agriculture". It emphasizes on yield improvement and will be achieved by increasing the efficiency in the utilization of natural resources, including irrigation. Simultaneously, crop diversification will be promoted along with exports and domestic consumption.

3.2.2 Eastern Seaboard Development

The Eastern Seaboard, which encompasses the whole of the Region, will be developed as a new growth center in accordance with the Fifth Plan, which calls for systematic decentralization of economic and industrial activities to the Region. The Region will be established as a center for basic and other downstream industries. The Region will become another major employment generator in the Central region. It will also serve the Northeast as a new gateway for its exports.

Concentration of industrial development and urban growth will promote more efficiency in development. From this point of view, seven concentrated development areas have been proposed. They are Chon Buri, Laem Chabang, Pattaya, Rayong including Map Ta Phut, Chachoengsao, Sattahip and Ban Phe.

Out of the above seven DAs, Chon Buri DA, Laem Chabang DA, Pattaya DA and Rayong DA are contemplated to be developed with a first priority and other three DAs are considered to be sub-center of the development. Fig. 6 shows locations of seven DAs. Table 36 shows the municipalities and sanitary districts involved in DAs.

There have been proposed 6 industrial zones in 5 DAs' as shown below:

Development Area	Proposed Zone		Proposed Industrial Development
	Name	Area (ha)	
Chon Buri	Chon Buri	160	Urban service industry
Laem Chabang	Laem Chabang	480	Export processing and light industry
Sattahip	Sattahip	40	Ship repairs and services and transshipment
Rayong	Map Ta Phut	800	Heavy industry, polluting industry and construction materials
	Rayong	80	Agro-industry
Chachoengsao	Chachaoengsao	80	Agro-industry
Total		1,640	

Data Source: ESS

Map Ta Phut would be the largest industrial development zone among the 6 proposed zones. Its industrial development would be constituted by (1) natural gas separation project, (2) soda-ash project, (3) petrochemical project, (4) chemical fertilizer project, and (5) others.

The proposed industrial development would certainly induce an extensive employment opportunity to a great extent. The population increase including the induced population is discussed in Section 3.3.

The development of infrastructure is also indispensable in order to accomplish the proposed industrial development satisfactorily. The infrastructure development plan proposed by ESS is shown in Table 38.

The Eastern Seaboard development would associate the social development such as labour development, public health service programme, urban development including housing programme, and environmental protection and improvement plan.

3.2.3 Regional Agricultural Development

Agriculture in the Region, which furnishes employment opportunities to more than 60 % of total employment and supplies raw materials to agro-industry, has played an important role as the leading sector in the economic activity. The present conditions of agricultural activities in the Region are summarized as follows:

(a) The cultivated area occupies 62 % of the Region and there is no room to newly develop the agricultural land.

(b) Two major irrigation projects are being operated, i.e. the Ban Phra Irrigation Project (1,360 ha in net) in Chon Buri Province and the Ban Khai Irrigation Project (4,800 ha in net) in Rayong Province. Despite of the provision of irrigation system, these areas are still subject to serious shortage of irrigation water even during the rainy season, due to lack of on-farm facilities, proper water management, agricultural support services, etc.

(c) Vast paddy fields still remain under rainfed condition, amounting to 63 % of the total paddy field, resulting in low land-productivity mainly due to shortage of irrigation water.

(d) As for the upland crops, sugarcane and cassava have been mainly cultivated in the Region. Sugarcane is being planted especially in Chon Buri Province. Recent annual productions of both crops have been maintained at the same level, though there exists a little fluctuation due to amount of annual rainfall.

Taking into consideration the above present conditions, the agricultural development in the Region has recently become an urgent need in order to improve the living standards of the rural population, most of which are engaged in agricultural production.

Rice is the principal crop as the national staple food and major export commodities for the Thailand. The Government has been emphasizing increase of rice production to cope with future population increase and expansion of export in line with the aim of the Fifth National Development Plan. To attain these targets, the increase of rice production in the Region is also expected with improvement of existing irrigation facilities and provision of new irrigation systems as well as the water resources development. In parallel with the provision of irrigation facilities, the agricultural support services, namely, extension services, seed multiplication, agricultural credit, marketing system of agricultural inputs and outputs, farmers' organization etc. is expected to be established to obtain the target yields.

On the other hand, the cultivation area of the upland crops such as sugarcane and cassava is projected to keep the present level and the improvement in yield per unit area is stressed because of little land for expansion.

3.3 Projection of Socio-Economic Framework of Region

3.3.1 Population

The projection of the future population consists of two components. The one component deals with the natural increase and migration. For clarity this component is called "natural growth". The other component is population growth directly dependent on the Eastern Seaboard development and its associated activities. This component is called "induced growth". The induced growth was estimated based on the estimated additional employment attributable to the development plans. The population projection contained herein is mainly quoted from ESS.

The population was projected separately for municipality, sanitary district and rural area. The municipality and sanitary district are herein defined as "urban settlements" and the rest of the Region as "rural area".

The average annual population growth rate of the natural growth was projected for the Chon Buri and Rayong Provinces as shown below.

Province	Average Annual Growth Rate (%)			
	1971-1981	1981-1986	1986-1991	1991-2001
Chon Buri	2.4	1.9	1.5	0.7
Rayong	3.5	1.8	1.5	0.9
Region	2.8	1.9	1.5	0.8

Data Source: ESS

The projected growth rate of the natural growth tends to decrease. The projected figures are almost consistent with those projected by NESDB and NSO for the whole Thailand as shown in Table 39. Compared with the NSO's projection, the projected value is a little smaller. This would be explained by such that the number of the out-transmigrants may increase in the Region because of limitation in land resources.

The average annual growth rates of the natural growth are projected for the urban settlement and rural area as shown in Tables 40 and 41, respectively. These projections are dependent on the study of present situations and future prospects, excluding additional industrial investment, in individual urban settlements and rural areas.

The projected population of the natural growth is summarized below.

Province	Area	Population (10 ³)				
		1981	1986	1991	1996	2001
Chon Buri	Urban	251	282	310	346	384
	Rural	482	523	557	565	543
	Sub-total	733	805	867	911	927
Rayong	Urban	59	64	70	79	91
	Rural	292	320	344	356	363
	Sub-total	352	384	414	435	454
Region	Urban	310	346	380	425	475
	Rural	774	843	901	921	906
	Total	1,084	1,189	1,281	1,346	1,381

Data Source: ESS

The induced growth of the population depends on employment increase by investment in industrial activities. The employment increase projected by ESS were adopted in the study based on the premise that ESS elaborates the Study for Eastern Seaboard development with the latest information. Taking into account the migrant labour force participation rates and the natural growth of the migrant population, the induced population growth was projected as shown below.

Year	Additional employment	Induced population
	(person)	(person)
1986	11,205	21,950
1991	32,180	64,350
1996	58,295	117,150
2001	99,100	194,650

Data Source: ESS

The induced population is distributed into the urban settlements (DAs) in proportion to the additional employments. Table 42 shows the distribution of the additional employment and induced population.

The future population in the Region is indicated by the sum of the natural growth and the induced growth and is projected as shown in Table 43. The followings are the summary.

Province	Projected Population (10 ³)				
	1981	1986	1991	1996	2001
Chon Buri	733	817	908	990	1,063
Rayong	352	394	438	473	513
Region	1,084	1,211	1,345	1,463	1,576

Data Source: ESS

As shown above, the total population of the Region is projected at 1,576 x 10³ in 2001, an increase of 492 x 10³ from 1981. The average growth rate of the population is 1.9 % per annum. The population of the development areas in 2001 are 211 x 10³, 190 x 10³, 103 x 10³, 26 x 10³, 150 x 10³ and 24 x 10³ in Chon Buri DA, Laem Chabang DA, Pattaya DA, Sattahip DA, Rayong DA and Ban Phe DA, respectively, as shown in Table 44.

3.3.2 Tourism

The Fifth Plan puts forward the following three items as its targets of tourism;

- (1) The number of foreign tourists will grow at the annual rate of 8.4 %.
- (2) The length of stay per foreign tourist will increase from 5.1 days in 1982 to 5.5 days in 1986.
- (3) Income from tourism is to expand by 21.5 % per year reaching 50,000 million Baht in 1986.

In order to attain the above-mentioned targets, several measures to attract foreign tourists and promote public and private investment are being planned.

In the two provinces, there are three tourism centers, namely Ban Saen, Pattaya and Ban Phe. Among these, Pattaya is prominent in terms of number of tourists and income from tourism.

Total number of tourists who stay at Pattaya and other tourism centers is projected based on such factors as follows:

- (1) Future trend of growth in international arrivals and Thai tourists to the Region.
- (2) Average length of stay in tourism centers.
- (3) Number of tourists to the tourism centers other than Pattaya; which will reach nearly 30 % in the year 2001.

(1) and (2) are presented in Tables 45 and 46 respectively. Projected number of tourists who will stay in Pattaya and other tourism centers are summarized as below.

	Unit: 10 ³ /day				
	1981	1986	1991	1996	2001
Pattaya	8.8	12.7	19.1	25.0	33.8
Others	0.1	1.9	3.1	6.8	13.3
Total	8.9	14.6	22.2	31.8	47.1

Source: ESS

Total expenditure by foreign and Thai tourist in the Region is projected as below.

	(Unit: 10 ⁶ ฿)				
	1981	1986	1991	1996	2001
	4,625.0	7,007.3	11,470.3	16,420.8	24,424.7

Source: ESS

(1981 constant price)

3.3.3 Gross Regional Product (GRP)

The projection of GRP in the Region consists of two components. The one component deals with the natural growth based on the historical trend. For clarity, this component is called "natural growth". The other is the growth directly dependent on the Eastern Seaboard development. This component is called "development growth". GRP is projected separately for Chon Buri and Rayong Provinces.

(1) Natural Growth

The natural growth is projected according to the following formula.

$$Y_n = a \cdot \ln X + b$$

where,

Y_n : GRP resulting from natural growth

X : Year.

Both parameters a and b are determined by regression as shown in Table 47. This formula implies the growth rate of GRP will decrease year by year, which can be interpreted as a slowdown of economic growth due to the limited land for an agricultural development and the industrial activity mainly dependent on local raw materials from agriculture such as sugarcane and cassava.

According to the formula, the annual growth rates of GRP are estimated at 6.1 % and 6.5 % in Chon Buri and Rayong provinces, respectively, for the period from 1981 to 1986. These growth rates are favourably compared with the target of the growth rate of GDP in the Fifth Plan, being 6.6 % per annum for the same period. The projected GRP and annual growth rate from natural increase are presented in Table 48 and summarized below.

Province	GRP from Natural Growth (10 ⁶ ฿) /1				
	1981	1986	1991	1996	2001
Chon Buri	11,865	15,927	19,742	23,353	26,780
Rayong	3,134	4,293	5,346	6,342	7,287
Region	14,999	20,220	25,088	29,695	34,067

/1 1972 constant price

(2) Development Growth

The development growth of GRP depends on the Eastern Seaboard development and is projected separately for the industry and the tourism. GRP from the industrial development growth is projected by the following formula.

$$Y_{di} = \sum_j VA_j^k \cdot (1 + r)^{x-k} \cdot E_j^x$$

where,

- Y_{di} : GRP from industrial development growth
- X : Target year of projection
- VA_j^k : Value added per employee (i.e. labour productivity)
in the standard year k
- r : Annual growth rate of value added per employee
- E_j^x : Number of employees in the year x
- j : Type of industry.

The values of VA_j^k are determined based on the "Industrial Census in Bangkok Metropolis, 1975" prepared by MOI as shown in Tables 49 and 50. The labour productivity is assumed to increase at the constant rate of 2 % per five years. This figure, which is lower than the actual growth rate of 3.6 % in Bangkok Metropolis for these five years, is adopted on the ground that the policy of the Government stresses the increase of employment opportunities and the promotion of labour intensive technology rather than the machine-oriented process in view of a continuous increase of labour force. The number of employment E_j^x refers to the projection by ESS.

GRP from the development growth of tourism is estimated based on the rate of the value added to the expenditure by tourists in the Region, which is projected in the precedent sub-section. Ratio of value added to the expenditure is assumed to be 35 %. The development growth is shown in Table 51 and summarized as below.

	GRP from Development Growth (10 ⁶ ฿) /1				
	1981	1986	1991	1996	2001
Chon Buri	0	517	1,664	3,064	5,454
Rayong	0	724	1,606	2,606	4,216
Region	0	1,241	3,270	5,670	9,669

/1 : 1972 constant price

(3) Overall Growth

The total GRP in the future is obtained by the sum of the natural growth and the development growth and is summarized as below. Increment of GRP in every five years and the average annual growth rate in the same period is shown in table 52 and 53.

Province	GRP (10 ⁶ B) /1					Annual Growth Rate (%) /2
	1981	1986	1991	1996	2001	
Chon Buri	11,865 (0.0)	16,444 (3.1)	21,406 (7.8)	26,417 (11.6)	32,233 (16.9)	5.1
Rayong	3,134 (0.0)	5,017 (14.4)	6,952 (23.1)	8,948 (29.1)	11,503 (36.7)	6.7
Region	14,999 (0.0)	21,461 (5.8)	28,358 (11.5)	35,365 (16.0)	43,736 (22.1)	5.5

/1 : 1972 constant price

/2 : Average growth rate from 1981 to 2001

Remarks : Figures parentheses show the percentage of the development growth to the total GRP.

GRP in the Region is projected to grow at the annual rate of 5.5 %, reaching $\text{฿ } 43,736 \times 10^6$ in 2001, which is the increase of $\text{฿ } 28,737 \times 10^6$ from 1981. The development growth for these 20 years is $\text{฿ } 9,666 \times 10^6$, occupying the share of 22 % of the total GRP in 2001. It accounts for 34 % of the total increment of GRP for the above-mentioned period.

(4) Per Capita GRP

The table below presents the projected per capita GRP.

Province	Per Capita GRP (฿)/ <u>1</u>					Annual Growth Rate (%) <u>2</u>
	1981	1986	1991	1996	2001	
Chon Buri	16,198	20,124	23,581	26,695	30,333	3.2
Rayong	8,911	12,734	15,883	18,912	22,414	4.7
Region	13,834	17,720	21,077	24,177	27,754	3.5

1 : 1972 constant price

2 : Average growth rate from 1981 to 2001

Per capita GRP in the Region increases from present ฿ 13,834 to ฿ 27,754 in 2001, which is the increase of more than two folds. Annual growth rate in twenty years is 3.2 % and 4.7 % for Chon Buri and Rayong provinces respectively. Faster growth of Rayong province results in the lessening of gap between the two provinces. Per capita GRP of Rayong province, which was only 55 % of Chon Buri province in 1981, is projected to grow to 74 % in 2001.

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TABLES

Table 1 POPULATION AND REGIONAL DISTRIBUTION

Regions	Population (10 ³)		Annual Average Growth Rate (%)	Regional distribution rate (%)	
	1970	1980		1970	1980
Central	10,612	14,288	3.02	30.8	32.3
Northeastern	12,025	15,461	2.55	35.0	34.9
Northern	7,489	8,945	1.79	21.8	20.2
Southern	4,272	5,584	2.71	12.4	12.6
Whole Thailand	34,397	44,278	2.56	100.0	100.0

Data Source: NSO

Table 2 POPULATION DENSITY

Regions	Area (km ²)	Population density (Persons/km ²)	
		1970	1980
Central	103,901	102.1	137.5
Northeastern	168,854	71.2	91.6
Northern	169,644	44.1	52.7
Southern	70,715	60.4	79.0
Whole Thailand	513,115	67.0	86.3

Data Source: NSO

Table 3 POPULATION DISTRIBUTION BETWEEN MUNICIPAL AND NON-MUNICIPAL AREAS

	Population (10 ³)		Proportion (%)		Average Annual Growth Rate (%)
	1970	1980	1970	1980	
Municipal	4,553	7,647	13.2	17.3	5.32
Bangkok Metro- polis /1	(2,495)	(4,711)	(7.3)	(10.7)	(6.56)
Others	(2,058)	(2,936)	(6.0)	(6.6)	(3.62)
Non-Municipal	29,844	36,631	86.8	82.7	2.07
Whole Thailand	34,397	44,278	100.0	100.0	2.56

/1 : Former Bangkok and Thon Buri Municipality

Data Source: NSO

Table 4 5-YEAR AGE DISTRIBUTION OF POPULATION IN 1970 AND 1980

Age Range	Population (10 ³)		Proportion (%)	
	1970	1980	1970	1980
0 - 4	5,659	5,358	16.5	12.1
5 - 9	5,285	5,712	15.4	12.9
10 - 14	4,562	5,845	13.3	13.2
15 - 19	3,718	5,313	10.8	12.0
20 - 24	2,683	4,339	7.8	9.8
25 - 29	2,241	3,542	6.5	8.0
30 - 34	2,124	2,701	6.2	6.1
35 - 39	1,911	2,347	5.6	5.3
40 - 44	1,541	2,170	4.5	4.9
45 - 49	1,197	1,860	3.5	4.2
50 - 54	962	1,550	2.8	3.5
55 - 59	790	1,107	2.3	2.5
60 - 64	625	886	1.8	2.0
65 - 69	452	620	1.3	1.4
70 -	604	930	1.8	2.1
Unknown	43	-	0.1	-
Total	34,397	44,278	100.0	100.0

Data Source: NSO

Table 5 VALUE ADDED IN CROPS IN 1981

Items	Quantity (10 ³ ton)	Value (₪ 10 ⁶) ^{/1}	Share (%)	Annual Growth Rate (%) ^{/2}
Paddy	17,368	22,570	39.3	1.46
Rubber	465	2,312	4.0	2.65
Sugar cane	19,854	3,574	6.2	-1.37
Maize & Sorghum	3,235	3,400	5.9	2.37
Cassava	16,540	5,635	9.8	4.62
Garlic, onion, shallot and chilli	366	2,433	4.2	-1.75
Fruits	-	9,839	17.1	3.98
Other Crops	-	7,728	13.4	2.37
Total	-	57,491	100.0	1.96

^{/1} : 1972 constant price

^{/2} : During a 5-year period from 1976 to 1981

Data Source: NESDB

Table 6 VALUE ADDED IN MANUFACTURING IN 1981

Items	Value (₪ 10 ⁶) ^{/1}	Share (%)	Annual Growth Rate (%) ^{/2}
Food, Beverages & Tobacco	20,485	31.3	3.11
Textile, Wearing Apparel & Leather Industries	15,481	23.7	5.36
Wood & Wood Products	1,245	1.9	-0.30
Paper & Paper Products, Printing & Publishing	2,918	4.5	5.31
Chemicals & Rubber Products	9,763	14.9	4.32
Non-Metallic Mineral Products	3,971	6.1	4.98
Basic Metal, Metal Products, Machinery & Equipment	10,199	15.6	6.54
Other Manufacturing Industries	1,390	2.1	3.53
Total	65,452	100.0	4.41

^{/1} : 1972 constant price

^{/2} : During a 5-year period from 1976 to 1981

Data Source: NESDB

Table 7 INTERNATIONAL TRADE BALANCE
(1971 TO 1981)

Unit: $\text{฿ } 10^6$ equivalent

Year	Import ^{/1}	Export ^{/2}	Balance	Deficit Ratio ^{/3} (%)
1971	26,794	17,281	-9,513	6.5
1972	30,875	22,491	-8,384	5.2
1973	42,184	32,226	-9,958	4.6
1974	64,044	50,245	-13,798	5.1
1975	66,835	48,438	-18,398	6.2
1976	72,877	60,797	-12,080	3.6
1977	94,177	71,198	-22,979	5.9
1978	108,899	83,065	-25,834	5.6
1979	146,161	108,179	-37,982	7.0
1980	193,618	133,197	-60,421	9.0
1981	216,742	153,030	-63,712	8.1

^{/1} : C.I.F. price

^{/2} : F.O.B. price

^{/3} : Ratio of trade deficit to GNP

Data Source: NESDB and Bank of Thailand

Table 8 MAJOR EXPORT AND IMPORT COMMODITIES
IN 1981

Export Commodities	Amount ^{/1}	Share ^{/2}
	(฿10 ⁶) equivalent	(%)
Rice	26,364	17.2
Rubber	10,840	7.1
Maize	8,341	5.5
Tapioca Products	16,439	10.7
Prawns	2,133	1.4
Tin	9,115	6.0
Sugar	9,571	6.3
Textile Products	12,180	8.0
Total	94,983	62.1

Import Commodities	Amount ^{/3}	Share ^{/4}
	(฿10 ⁶) equivalent	(%)
Fuel & lubricants	65,061	30.0
Non-electrical machinery and parts	25,889	11.9
Electrical machinery and parts	10,877	5.0
Chemical products	18,109	8.4
Base Metals	18,731	8.6
Vehicles and parts	9,486	4.4
Total	148,153	68.4

^{/1} : F.O.B. price

^{/2} : Against the entire export amount

^{/3} : C.I.F. price

^{/4} : Against the entire import amount

Data Source: Bank of Thailand

Table 9 PRODUCTION AND EXPORTS OF RICE

Year	Production		Exports		Proportion	
	Quantity (10 ³ ton)	Value ^{/1} (¥ 10 ⁶)	Quantity (10 ³ ton)	Value ^{/2} (¥ 10 ⁶)	Rice Production ^{/3} (%)	Total Exports ^{/4} (%)
1971	13,744 ^{/5}	10,994 ^{/5}	1,576	2,909	11.4	16.8
1972	12,413	16,271	2,112	4,434	17.0	19.7
1973	14,899	29,180	849	3,594	5.7	11.2
1974	13,386	29,881	1,016	9,810	7.6	19.5
1975	15,300	30,268	906	5,581	5.9	11.5
1976	15,068	28,184	1,973	8,603	13.1	14.2
1977	13,921	32,964	2,946	13,383	21.2	18.8
1978	17,470	40,426	1,607	10,424	9.2	12.5
1979	15,758	35,329	2,797	15,592	17.7	14.4
1980	17,368	46,460	2,800	19,508	16.1	14.6

/1 : Farm Value

/2 : F.O.B. price

/3 : Ratio of rice exports to rice production in quantity

/4 : Ratio of rice exports to total exports in value

/5 : Second rice crop is not included

Data Source : MOAC and Bank of Thailand

Table 10 LABOUR FORCE AND UNEMPLOYMENT RATIO

Unit: 10³ persons

Year	Labour Force (10 ³)	Employed (10 ³)	Unemployed (10 ³)	Unemployment Ratio (%)
1971	16,654	16,619	35	0.21
1972	16,215	16,129	85	0.53
1973	17,117	17,043	74	0.43
1974	17,232	17,159	73	0.42
1975	18,255	18,182	74	0.40
1976	18,566	18,411	155	0.83
1977	20,477	20,218	258	1.26
1978	21,895	21,669	227	1.03
1979	21,420	21,180	240	1.12
1980	22,728	22,463	265	1.17

Data Source: NESDB

Table 11 ANNUAL INCREASING RATE OF LABOUR
FORCE AND UNEMPLOYMENT RATIO

Unit: %

Period	Labour Force	Employed	Unemployed	Unemployment Ratio
1971 - 1974	1.14	1.07	27.14	25.99
1974 - 1977	5.92	5.62	52.73	44.22
1977 - 1980	3.54	3.57	0.89	-2.44

Data Source: NESDB

Table 12 DISTRIBUTION OF POPULATION
BY ECONOMIC ACTIVITY

Descriptions	Unit: %			
	1970		1980	
	Total	Total	Male	Female
<u>Economically Active</u>				
Employed	41.5	45.1	50.2	40.1
Looking for work	1.0	2.2	2.7	1.7
Waiting for farm season	32.4	18.5	21.6	15.6
Sub-total	75.0	65.8	74.5	57.4
<u>Non-economically Active</u>				
House-wife	8.2	11.6	2.3	20.5
Student	8.9	14.4	15.6	13.4
Unable to work	0.6	5.2	3.8	6.5
Others	5.6	1.5	2.2	0.8
Sub-total	23.4	32.7	23.9	41.2
<u>Unknown</u>	1.6	1.5	1.6	1.4
Total	100.0	100.0	100.0	100.0

Data Source: NSO

Table 13 DISTRIBUTION OF ECONOMICALLY
ACTIVE POPULATION BY SECTOR

Sector	Unit: %			
	1970		1980	
	Total	Total	Male	Female
Agriculture	79.3	72.5	69.6	75.5
Manufacturing	5.7	7.4	8.9	6.0
Services	14.1	17.4	18.5	16.3
Unknown	0.9	2.7	3.0	2.2
Total	100.0	100.0	100.0	100.0

Data Source: NSO

Table 14 ADMINISTRATIVE DIVISION

Province	District/ Sub-district	Nos. of Township	Nos. of Village
Chon Buri	Muang Chon Buri	18	137
	Phan Thong	11	74
	Phanat Nikhom	21	181
	Si Racha	7	40
	Ban Bung	7	44
	K.A. Bo Thong	3	20
	K.A. Nong Yai	3	14
	Bang Lamung	8	66
	Sattahip	4	27
	K.A. Ko Sichang	1	6
Rayong	Pluak Daeng	4	18
	Ban Khai	9	53
	K.A. Wang Chan	3	18
	Klaeng	13	89
	K.A. Ban Chang	2	13
	Muang Rayong	13	57

Data Source: DOLA

Table 15 LIST OF MUNICIPALITY AND SANITARY DISTRICT

Province	Municipality		Sanitary District		
	Name	Location ^{/1}	Name	Location ^{/1}	
Chon Buri	M. Chon Buri	M. Chon Buri	Ban Suan	M. Chon Buri	
	Si Racha	Si Racha	Saen Suk	M. Chon Buri	
	Phanat Nikhom Pattaya	Phanat Nikhom	Bang Lamung	Bang Sai	M. Chon Buri
				Tha Bun Mi	Phanat Nikhom
				Phan Thong	Phan Thong
				Nong Tamlung	Phan Thong
				Ban Bung	Ban Bung
				Hua Kun Jae	Ban Bung
				Bang Phra	Si Racha
				Ao Udom	Si Racha
				Bang Lamung	Bang Lamung
				Huai Yai	Bang Lamung
				Sattahip	Sattahip
				Ko Sichang	K.A. Ko Sichang
			Nong Yai	K.A. Nong Yai	
			Bo Thong	K.A. Bo Thong	
Rayong	M. Rayong	M. Rayong	Map Ta Phut	M. Rayong	
	Thang Kwian	Klaeng	Ban Phe	M. Rayong	
			Ban Khai	Ban Khai	
				Pluak Daeng	Pluak Daeng
				Ban Chang	K.A. Ban Chang
				Thung Khwai Kin	Klaeng
				Pak Nam Prasae	Klaeng
				Chomphon Chaophraya	Pluak Daeng

^{/1}: Name of the district/sub-district in which the municipality or the sanitary district is located.

Data Source: DOLA

Table 16 POPULATION AND GROWTH RATE IN REGION

Province	Population (10 ³)			Annual Growth Rate (%)	
	1971	1976	1981	1971-1976	1976-1981
Chon Buri	582 (69.3)	669 (67.0)	738 (66.9)	2.85	1.98
Rayong	258 (30.7)	330 (33.0)	365 (33.1)	4.99	2.03
Total	840 (100.0)	999 (100.0)	1,103 (100.0)	3.53	2.00

Note : Figures parentheses show the proportion to the total in percent.

Data Source : DOLA

Table 17 POPULATION DISTRIBUTION IN REGION

District/ Subdistrict	Area	Year			Annual Growth Rate(%)	
		1971	1976	1981	1971- 1976	1976- 1981
<u>Chon Buri Province</u>						
Chon Buri	Municipal	45,839	49,017	50,064	1.3	0.4
	Non-municipal	94,760	107,454	122,632	2.5	2.7
Phanat Nikhom	Municipal	12,351	13,014	13,506	1.1	0.7
	Non-municipal	101,131	123,321	111,897	4.0	-
Bo Thong	Non-municipal	-	-	26,447	-	-
Si Racha	Municipal	17,449	17,491	22,315	0.0	5.0
	Non-municipal	69,976	77,993	86,556	2.2	2.1
Bang Lamung	Municipal	-	-	36,507	-	-
	Non-municipal	60,004	68,870	44,772	2.8	-
Phan Thong	Non-municipal	33,674	36,739	38,669	1.8	1.0
Ban Bung	Non-municipal	83,357	76,104	78,519	-	0.6
Nong Yai	Non-municipal	-	16,158	17,809	-	2.0
Sattahip	Non-municipal	60,481	80,355	85,598	5.8	1.3
Ko Sichang	Non-municipal	2,606	2,697	2,930	0.7	1.7
Sub-total	Municipal	<u>75,639</u>	<u>79,522</u>	<u>122,392</u>	<u>1.0</u>	<u>9.0</u>
	Non-municipal	<u>505,989</u>	<u>589,691</u>	<u>615,829</u>	<u>3.1</u>	<u>0.9</u>
<u>Rayong Province</u>						
Rayong	Municipal	20,530	26,250	37,827	5.0	-
	Non-municipal	89,226	84,582	85,001	-	-
Ban Chang	Non-municipal	-	27,218	27,939	-	0.5
Ban Khai	Non-municipal	53,844	68,941	71,277	5.1	0.7
Pluak Daeng	Non-municipal	11,426	23,910	26,492	15.9	2.1
Klaeng	Municipal	-	-	12,331	-	-
	Non-municipal	83,409	98,823	90,247	3.4	-
Wang Chan	Non-municipal	-	-	13,618	-	-
Sub-total	Municipal	<u>20,530</u>	<u>26,250</u>	<u>50,158</u>	<u>5.0</u>	<u>13.8</u>
	Non-municipal	<u>237,905</u>	<u>303,474</u>	<u>314,574</u>	<u>5.0</u>	<u>0.7</u>
<u>Region</u>						
Total	Municipal	<u>96,169</u>	<u>105,772</u>	<u>172,550</u>	<u>1.9</u>	<u>10.3</u>
	Non-municipal	<u>743,894</u>	<u>893,165</u>	<u>930,403</u>	<u>3.7</u>	<u>0.8</u>

Data Source : DOLA

Table 18 POPULATION DENSITY IN REGION

Province	Area (km ²)	Population Density (persons/km ²)		
		1971	1976	1981
Chon Buri	4,363	133.3	153.4	169.1
Rayong	3,552	72.8	92.9	102.8
Region	7,915	106.1	126.2	139.4

Data Source : DOLA

Table 19 GRP AND PER CAPITA GRP IN REGION

Province	Value ^{/1}			Annual Growth Rate (%)	
	1973	1976	1981	1973 - 1976	1976 - 1981
GRP (฿ 10 ⁶)					
Chon Buri	5,972	7,633	11,865	8.5	9.2
Rayong	1,916	1,970	3,134	0.9	9.7
<u>Region</u>	<u>7,889</u>	<u>9,603</u>	<u>14,999</u>	<u>6.8</u>	<u>9.3</u>
Per capita GRP (฿)					
Chon Buri	9,680	11,406	16,072	5.6	7.1
Rayong	6,591	5,975	8,593	-3.2	7.5
<u>Region</u>	<u>8,692</u>	<u>9,613</u>	<u>13,599</u>	<u>3.4</u>	<u>7.2</u>

^{/1}: 1972 constant price

Data Source : NESDB and NSO

Table 20 GRP BY SECTOR IN REGION

	Value (฿ 10 ⁶)/ ¹		Share (%)		Annual Growth Rate (%)
	1976	1981	1976	1981	
<u>Chon Buri province</u>					
Agriculture/ ²	1,878	2,866	24.6	24.2	8.8
Manufacturing/ ³	3,626	5,746	47.5	48.4	9.6
Services	2,129	3,253	27.9	27.4	8.8
Sub-total	<u>7,633</u>	<u>11,865</u>	<u>100.0</u>	<u>100.0</u>	<u>9.2</u>
<u>Rayong province</u>					
Agriculture/ ²	1,004	1,709	51.0	54.5	11.2
Manufacturing/ ³	385	592	19.5	18.9	9.0
Services	582	833	29.5	26.6	7.4
Sub-total	<u>1,971</u>	<u>3,134</u>	<u>100.0</u>	<u>100.0</u>	<u>9.7</u>
<u>Region</u>					
Agriculture/ ²	2,882	4,575	30.0	30.5	9.7
Manufacturing/ ³	4,011	6,338	41.8	42.3	9.6
Services	2,711	4,086	28.2	27.2	8.6
Total	<u>9,604</u>	<u>14,999</u>	<u>100.0</u>	<u>100.0</u>	<u>9.3</u>

¹ : 1972 constant price

² : Includes livestock, fisheries and forestry

³ : Includes mining and construction

Data Source : NESDB

Table 21. AGRICULTURAL LAND USE OF REGION IN 1980

	Chon Buri province	Rayong province	Region	Whole Thailand
<u>Area (km²)</u>				
Housing area	40	43	82	4,033
Paddy land	636	316	952	117,701
Under field crops	1,896	1,480	3,376	41,212
Under fruit tree	168	390	558	17,829
Under vegetable	4	2	5	503
Idle land	7	12	19	4,903
Others	152	33	186	4,218
Total	<u>2,902</u>	<u>2,276</u>	<u>5,178</u>	<u>190,398</u>
<u>Proportion (%)</u>				
Housing area	1.4	1.9	1.6	2.1
Paddy land	21.9	13.9	18.4	61.8
Under field crops	65.3	65.0	65.2	21.6
Under fruit tree	5.8	17.1	10.8	9.4
Under vegetable	0.1	0.1	0.1	0.3
Idle land	0.2	0.5	0.4	2.6
Others	5.2	1.5	3.6	2.2
Total	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>
<u>Average Farm Size (ha)</u>	7.4	5.9	6.7	4.3

Data Source: MOAC

Table 22 PLANTED AREA AND PRODUCTION OF SUGARCANE

	Year						Ratio ^{/1} (%)
	1975	1976	1977	1978	1979	1980	
<u>Planted Area (km²)</u>							
Chon Buri Province	667	545	583	519	542	549	11.7
Rayong Province	91	120	200	234	211	315	6.7
Region	757	664	783	753	753	864	18.5
<u>Production (10³ ton)</u>							
Chon Buri Province	3,177	2,649	2,796	2,301	1,669	2,112	10.6
Rayong Province	422	558	933	917	587	1,150	5.8
Region	3,599	3,206	3,729	3,219	2,256	3,261	16.4
<u>Yield (ton/ha)</u>							
Chon Buri Province	47.7	48.6	48.0	44.3	30.8	38.5	90.8
Rayong Province	46.6	46.6	46.6	39.3	27.8	36.5	86.1
Region	47.5	48.3	47.6	42.8	30.0	37.7	88.9
Whole Thailand	50.9	52.2	33.4	40.2	28.7	42.4	100.0

^{/1} : Proportion to the whole Thailand in 1981

Data Source : MOAC

Table 23. PLANTED AREA AND PRODUCTION OF CASSAVA

	Year						Ratio ^{/1} (%)
	1975	1976	1977	1978	1979	1980	
<u>Planted Area (km²)</u>							
Chon Buri Province	766	1,055	996	1,020	721	1,162	10.0
Rayong Province	726	912	902	1,081	805	921	7.9
Region	1,492	1,967	1,898	2,102	1,526	2,083	18.0
<u>Production (10³ ton)</u>							
Chon Buri Province	1,026	1,306	1,287	1,421	847	1,708	10.3
Rayong Province	1,302	1,696	1,438	1,894	1,150	1,503	9.1
Region	2,328	3,003	2,724	3,314	1,997	3,211	19.4
<u>Yield (ton/ha)</u>							
Chon Buri Province	13.4	12.4	12.9	13.9	11.7	14.7	102.8
Rayong Province	17.9	18.6	15.9	17.5	14.3	16.3	114.0
Region	15.6	15.3	14.4	15.8	13.1	15.4	107.7
Whole Thailand	14.9	14.8	14.0	14.0	13.1	14.3	100.0

^{/1} : Proportion to the whole Thailand in 1981

Data Source : MOAC

Table 24 PLANTED AREA AND PRODUCTION OF MAJOR RICE

	Year						Ratio ^{/1} (%)
	1975	1976	1977	1978	1979	1980	
<u>Planted Area (km²)</u>							
Chon Buri Province	599	496	515	512	344	473	0.5
Rayong Province	220	169	239	257	242	271	0.3
Region	829	664	754	769	586	744	0.8
<u>Production (10³ ton)</u>							
Chon Buri Province	135	82	66	99	35	90	0.6
Rayong Province	34	25	34	54	47	49	0.3
Region	170	107	99	154	82	138	0.9
<u>Yield (ton/ha)</u>							
Chon Buri Province	2.25	1.66	1.28	1.94	1.00	1.90	112.4
Rayong Province	1.55	1.45	1.41	2.11	1.96	1.81	107.1
Region	2.07	1.61	1.32	1.99	1.40	1.85	109.5
Whole Thailand	1.65	1.68	1.44	1.63	1.61	1.69	100.0

^{/1} : Propotion to whole Thailand in 1981

Data Source : MOAC

Table 25 EMPLOYMENT BY MANUFACTURING SUBSECTOR IN 1980

(Unit: person)

	Employees			Share (%)
	Chon Buri	Rayong	Region	
Food, Beverage & Tobacco	10,539	4,648	15,187	36.4
Textile, Wearing Apparel & Leather Industries	4,912	1,811	6,723	16.1
Wood & Wood Products	4,113	930	5,043	12.1
Paper & Paper Products, Printing & Publishing	474	153	627	1.5
Chemicals & Rubber Products	1,641	399	2,040	4.9
Non-metallic Mineral Products	1,819	173	1,992	4.8
Basic Metal, Metal Products, Machinery & Equipment	6,859	2,298	9,157	21.9
Other Manufacturing	820	167	987	2.4
Total	31,177	10,579	41,756	100.0

Data Source : NSO

Table 26 SCALE DISTRIBUTION OF FACTORIES IN 1981

Province	Number of factories by employee						Total
	1-9	10-29	30-49	50-99	100-299	300-	
Chon Buri	1,034 (75.8)	258 (18.9)	25 (1.8)	21 (1.5)	21 (1.5)	6 (0.4)	1,365 (100.0)
Rayong	711 (87.0)	85 (10.4)	7 (0.9)	9 (1.1)	5 (0.6)	0 (0.0)	817 (100.0)
Region	1,745 (80.0)	343 (15.7)	32 (1.5)	30 (1.4)	26 (1.2)	6 (0.2)	2,182 (100.0)

Note : Figures-parentheses show the percentage distribution

Data Source : DIW

Table 27 VISITOR TO THAILAND AND VISITOR EXPENDITURES

	1976	1977	1978	1979	1980	1981
No. of Visitors (10^3)	1,098	1,221	1,454	1,591	1,859	2,016
Visitor Expenditures (฿ 10^6)	3,007	4,606	8,895	11,232	17,765	21,455
Exported Value (฿ 10^6)	60,797	71,198	83,065	108,179	133,197	153,030
Tourism Ratio ^{/1}	0.05	0.06	0.11	0.10	0.13	0.14

^{/1} : Ratio of visitor expenditures to the exported value

Data Source : TAT and Bank of Thailand

Table 28 PRODUCTIVITY BY SECTOR IN 1980

	GRP (฿ 10 ⁶)	Employed Population (10 ³)	Productivity (฿ 10 ³ /person)
<u>Chon Buri province</u>			
Agriculture	2,691	172	15.6
Manufacturing	5,303	44	121.6
Services	3,022	102	39.6
Total	11,016	318	34.6
<u>Rayong province</u>			
Agriculture	1,620	128	12.6
Manufacturing	552	14	38.7
Services	781	31	25.0
Total	2,953	173	17.1
<u>Region</u>			
Agriculture	4,311	300	14.3
Manufacturing	5,855	58	101.1
Services	3,803	133	28.6
Total	13,969	491	28.5

Data Source: NESDB and NSO

Table 29 DISTRIBUTION OF POPULATION BY ECONOMIC ACTIVITY IN 1980

(Unit: %)

	Province		Region	Area	
	Chon Buri	Rayong		Municipal	Others
Economically Active					
Employed	58.2	66.8	61.0	57.5	61.5
Looking for work	2.4	1.4	2.1	2.5	2.0
Waiting for farm season	4.2	4.5	4.3	0.1	4.9
Sub-total	<u>64.8</u>	<u>72.6</u>	<u>67.3</u>	<u>60.1</u>	<u>68.5</u>
Non-economically Active					
House-wife	10.8	7.1	9.6	11.8	9.3
Student	15.2	12.0	14.2	17.4	13.6
Unable to work	5.2	4.4	4.9	5.2	4.9
Others	1.9	2.1	2.0	3.3	1.7
Sub-total	<u>33.1</u>	<u>25.6</u>	<u>30.7</u>	<u>37.8</u>	<u>29.5</u>
Unknown	2.1	1.8	2.0	2.1	2.0
Total	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>
Unemployment Ratio ^{/1}	3.7	1.9	3.1	4.2	2.9

^{/1}: Ratio of "looking for work" to "economically active"

Data Source: NSO

Table 30 DISTRIBUTION OF ECONOMICALLY ACTIVE
POPULATION BY SECTOR IN REGION

	Population(10 ³)		Share(%)		Annual Growth Rate (%)
	1970	1980	1970	1980	
<u>Chon Buri province</u>					
Agriculture	150	172	69.6	54.2	1.4
Manufacturing	26	44	10.6	13.7	5.2
Services	71	102	28.7	32.1	3.7
Total	<u>247</u>	<u>318</u>	<u>100.0</u>	<u>100.0</u>	<u>2.5</u>
<u>Rayong province</u>					
Agriculture	95	128	77.4	73.9	3.1
Manufacturing	8	14	6.2	8.2	6.6
Services	20	31	16.5	17.9	4.5
Total	<u>122</u>	<u>174</u>	<u>100.0</u>	<u>100.0</u>	<u>3.6</u>
<u>Region</u>					
Agriculture	245	300	66.2	61.1	2.1
Manufacturing	34	58	9.1	11.8	5.5
Services	91	133	24.7	27.1	3.9
Total	<u>370</u>	<u>492</u>	<u>100.0</u>	<u>100.0</u>	<u>2.9</u>

Data Source: NSO

Table 31 DISTRIBUTION OF ECONOMICALLY ACTIVE POPULATION
BY SECTOR AND AREA IN 1980

	Population (10 ³)			Share (%)		
	Munici- pality	Sanitary district	Rural	Munici- pality	Sanitary district	Rural
<u>Chon Buri province</u>						
Agriculture	4	34	134	8.4	40.5	72.5
Manufacturing	11	16	17	22.7	18.5	9.2
Services	33	35	34	69.0	41.0	18.3
Total	<u>48</u>	<u>85</u>	<u>184</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>
<u>Rayong province</u>						
Agriculture	1	6	121	12.9	30.0	82.5
Manufacturing	2	3	9	17.8	16.8	6.2
Services	8	10	17	69.3	53.2	11.2
Total	<u>11</u>	<u>19</u>	<u>147</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>
<u>Region</u>						
Agriculture	5	40	255	9.2	38.6	77.0
Manufacturing	13	19	26	21.8	18.2	7.9
Services	41	45	50	69.0	43.3	15.2
Total	<u>59</u>	<u>104</u>	<u>331</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

Data Source: NSO

Table 32 DRINKING WATER AND WATER SUPPLY SITUATION IN 1980

(Unit: %)

	Province		Region	Area	
	Chon Buri	Rayong		Municipal	Non-municipal
<u>Drinking Water</u>					
Piped, Inside	15.8	7.1	12.9	46.8	7.3
Piped, Outside	7.6	2.4	5.8	11.8	4.8
Public Well	6.7	3.9	5.8	1.5	6.5
Private Well	33.7	69.6	45.8	6.8	52.3
Others	34.4	15.6	28.0	30.6	27.6
Unknown	1.8	1.3	1.7	2.5	1.5
Total	100.0	100.0	100.0	100.0	100.0
<u>Water Supply</u>					
Piped, Inside	19.2	8.4	15.6	53.0	9.3
Piped, Outside	8.3	2.5	6.3	11.7	5.5
Public Well	11.6	5.2	9.4	5.6	10.1
Private Well	55.0	81.0	63.8	24.2	70.3
Others	3.9	1.6	3.1	3.4	3.1
Unknown	2.0	1.3	1.8	2.2	1.7
Total	100.0	100.0	100.0	100.0	100.0

Data Source : NSO

Table 33 * FURNISHING OF LIGHTING, BATHROOM
AND TOILET FACILITIES IN 1980

(Unit: %)

	Province		Region	Area	
	Chon Buri	Rayong		Municipal	Non-municipal
<u>Lighting</u>					
Electric Lighting	65.0	46.1	58.6	93.9	52.7
Oil Lamp	32.1	50.9	38.5	4.1	44.2
Others & Unknown	2.9	3.0	2.9	2.0	3.1
Total	100.0	100.0	100.0	100.0	100.0
<u>Bathroom</u>					
Bathroom, Exclusive	69.9	53.2	64.3	83.3	61.1
Bathroom, Shared	3.8	2.8	3.5	7.4	2.8
Terrace & Verondah	10.6	9.7	10.3	5.3	11.2
River, Canal & Well	13.9	32.4	20.1	1.7	23.2
Others & Unknown	1.7	1.9	1.8	2.4	1.7
Total	100.0	100.0	100.0	100.0	100.0
<u>Toilet Facility</u>					
Flush, Exclusive	4.6	3.1	4.1	7.2	3.6
Flush, Shared	0.5	0.4	0.5	1.1	0.4
Bucket, Exclusive ^{/1}	64.3	49.6	59.4	77.0	56.4
Bucket, Shared ^{/1}	4.8	3.7	4.4	7.9	3.9
Pit	15.5	26.5	19.2	1.3	22.2
Others	9.0	15.3	11.2	4.1	12.3
Unknown	1.2	1.3	1.2	1.6	1.2
Total	100.0	100.0	100.0	100.0	100.0

^{/1}: Moulded Bucket Latrine

Data Source: NSO

Table 34 DIFFUSION RATE OF DURABLE HOUSEHOLD APPLIANCE IN 1970 AND 1980

(Unit: %)

	Region		Area/1	
	1970	1980	Municipal	Non-municipal
Radio	83.1	94.9	88.6	96.0
Television	15.0	34.7	63.8	29.9
Refrigerator	6.3	24.6	48.8	20.7
Electric Fan	17.9	45.6	83.0	39.5
Bicycle	45.2	54.9	51.2	55.5
Motor Cycle	17.7	39.4	34.0	40.3
Motor Car	9.1	15.6	20.9	14.8
Motor Boat	1.5	2.2	3.2	2.0
Water Pump ^{/2}	5.6	11.7	1.9	13.3
Ploughing Machine	0.8	3.6	0.2	4.2

^{/1} : Condition for 1980

^{/2} : Irrigation use

Data Source : NSO

Table 35 ECONOMIC TARGETS OF THE FIFTH PLAN

	Fourth Plan ^{/1} (1977-1981)	Fifth Plan (1982-1986)
Trade deficit		
Average annual value (¥ 10 ⁶)	45,300	78,400
Trade deficit/GDP (%)	7.6	5.9
Current account deficit		
Average annual value (¥ 10 ⁶)	37,400	53,000
Current account deficit/GDP (%)	6.3	4.1
Exports of goods		
Growth in value (% per annum)	21.9	22.3
Growth in volume (% per annum)	10.5	11.3
Imports of goods		
Growth in value (% per annum)	26.3	18.1
Growth in volume (% per annum)	10.9	7.2
Economic Growth		
GDP (% per annum)	7.3	6.6
Agriculture (% per annum)	3.5	4.5
Manufacturing (% per annum)	9.3	7.6
Mining (% per annum)	12.6	16.4
Natural gas (million cubic ft/day)	200	525
Growth rate of population	2.1	1.5

^{/1}: Actual values for Fourth Plan

Note: GDP deflator is assumed to rise at annual rate of 10.6% during the Fifth Plan period compared with the corresponding figure of 11.2% per annum during the Fourth Plan period.

Data Source: NESDB

Table 36 DEVELOPMENT AREA AND URBAN SETTLEMENT

Development Area	Municipalities and Sanitary District Involved	
Chon Buri	Chon Buri M. Ban Suan SD.	Bang Sai SD. Saen Suk SD.
Laem Chabang	Si Racha M. Bang Phra SD.	Ao Udom SD. Bang Lamung SD.
Pattaya	M. Pattaya	
Sattahip	Sattahip SD.	
Rayong ^{/1}	Rayong M.	Map Ta Phut SD.
Ban Phe	Ban Phe SD.	
Chachoengsao	Chachoengsao M.	

^{/1} : Includes some rural area other than urban settlements

Data Source : ESS

Table 37 PROPOSED INDUSTRIAL ZONES AND GUIDELINES FOR
PHASED SERVICES DEVELOPMENT WITHIN THE ZONE

(Unit: ha)

Industrial Zones	Extension of Main Services				Total
	1981-1986	1986-1991	1991-1996	1996-2001	
Chon Buri	24	24	48	64	160
Laem Chabang	64	128	128	160	480
Rayong	16	16	20	28	80
Map Ta Phut	320	160	160	160	800
Sattahip	24	16	-	-	40
Total	448	344	356	412	1,560

Data Source : ESS

Table 38 PROPOSED INFRASTRUCTURE DEVELOPMENT PLAN

Field	Facility	Construction Period
Ports	Sattahip : rehabilitation	1983 - 1984
	Sattahip : new berths	1983 - 1990
	Laem Chabang : break water etc.	1987 - 1988
	Laem Chabang : four new berths	1988 - 1992
	Sattahip or Laem Chabang : new berths	1993 - 1997
Railway	Chachoengsao - Sattahip	1981 - 1983
	Sattahip - Map Ta Phut	1983 - 1985
	Link between the Eastern Railway & the North Railway	1983 - 1985
	Laem Chabang Spur	1989 - 1991
Road	Sattahip - Rayong : upgrading	1985 - 1986
	Rayong : by-pass extension	1985 - 1986
	Pattaya - Sattahip : upgrading	1985 - 1986
	Pattaya : spur road development	1985 - 1986
	Map Ta Phut - 3191 : upgrading	1986 - 1986
	Chon Buri - Pattaya : improvement	1986 - 1987
	Chon Buri by-pass : upgrading	1986 - 1987
	Route 314 : upgrading	1987 - 1988
	Chon Buri - Pattaya : upgrading	1989 - 1990
	Route 315 : improvement	1990 - 1990
	Laem Chabang : urban road	1990 - 1991
	Pattaya - Sattahip : improvement	1991 - 1995
Si Racha - Laem Chabang : by-pass	1991 - 1998	
Electricity	Rayong : sub-station 3	1983
	Rayong : line from sub-station 2	1983
	Laem Chabang : sub-station	1991
	Ao Phai - Laem Chabang : line	1991
Telephones	Map Ta Phut : exchange	1985
	Laem Chabang : exchange	1985
Telex	Map Ta Phut : exchange	1985
	Rayong : exchange	1985
	Sattahip : exchange	1985

Data Source: ESS

Table 39 PROJECTED POPULATION GROWTH RATE OF WHOLE THAILAND

	Average Annual Growth Rate (%)					
	1975- 1980/ ¹	1980- 1985	1985- 1990	1990- 1995	1995- 2000	2000- 2005
Projection By NSO						
Low Fertility Case	2.31	1.99	1.52	1.47	1.36	1.21
High Fertility Case	2.31	2.09	1.71	1.68	1.57	1.44
Plan By NESDB	-	1.87/ ²	-	-	-	-

¹ : Actual growth rate

² : Planned annual growth rate from 1982 to 1986

Data Source : NSO and NESDB

Table 40 PROJECTED AVERAGE ANNUAL GROWTH RATE OF
NATURAL INCREASE FOR URBAN SETTLEMENT

Category	Average annual growth rates (%)				
	1981- 1986	1986- 1991	1991- 1996	1996- 2001	1981- 2001
A	2.0	1.8	2.4	2.4	2.2
B	1.3	1.3	2.1	2.1	2.2
C	5.0	3.5	2.5	2.0	3.2
D	3.2	1.8	1.4	1.0	1.9
E	0.5	0.5	0.5	0.5	0.5
F	2.4	1.9	1.0	0.7	1.5

Note : Category classification of urban settlement

A : Chon Buri, Si Racha, Saen Suk, Bang Phra, Ao Udom, Bang Lamung,
Ban Suan and Bang Sai

B : Sattahip, Huai Yai, Rayong, Ban Chang, Map Ta Phut and Ban Phe

C : Pattaya

D : Nong Yai, Tha Bun Mi, Bo Thong, Ban Khai, Thang Khwian and
Pluak Daeng

E : Phanat Nikhom, Phan Thong, Hua Kun Jae, Nong Tamlung and
Ban Bung

F : Chomphon Chaophraya, Pak Nam Prasac and Thung Khwai Kin

Data Source : ESS

Table 41 PROJECTED AVERAGE ANNUAL GROWTH RATE OF NATURAL INCREASE FOR RURAL AREA

Category	Average annual growth rates (%)				
	1981-1986	1986-1991	1991-1996	1996-2001	1981-2001
Chon Buri province					
a	0.7	0.3	-0.1	-1.0	-0.0
b	2.1	1.7	0.3	-1.0	0.8
c	3.2	2.3	1.4	1.0	2.0
Rayong province					
d	0.9	0.4	0.0	-0.3	0.2
e	2.4	1.9	1.0	0.7	1.5

Note : Category classification of districts

a (rice growing areas) : Chon Buri, Phan Thong and Phanat Nikhom districts

b (mixed agricultural areas) : Si Racha, Bang Lamung, Ban Bung and Sattahip districts

c (sparsely populated interior areas) : Nong Yai and Bo Thong sub-districts

d (coastal areas) : Rayong district and Ban Chang sub-district

e (interior areas and Prasae River Basin) : Ban Khai, Pluak Daeng and Klaeng districts, Wang Chan sub-districts

Data Source : ESS

Table 42 ADDITIONAL EMPLOYMENT AND PROJECTED INDUCED POPULATION

(Unit: person)

Development Area	1986	1991	1996	2001
<u>Employment</u>				
Chon Buri	1,025	2,050	3,420	5,250
Laem Chabang	2,245	10,890	24,185	47,760
Pattaya	2,420	6,500	12,100	18,000
Rayong ^{/1}	4,300	8,950	13,800	21,300
Sattahip	615	1,590	1,590	1,590
Ban Phe	600	2,200	3,200	5,200
Total	11,205	32,180	58,295	99,100
<u>Population</u>				
Chon Buri	2,000	4,000	6,600	9,900
Laem Chabang	4,400	21,050	46,100	88,700
Pattaya	4,750	12,600	23,200	33,850
Rayong ^{/1}	8,400	19,300	31,950	49,300
Sattahip	1,200	3,100	3,100	3,100
Ban Phe	1,200	4,300	6,200	9,800
Total	21,950	64,350	117,150	194,650

^{/1} : Includes Map Ta Phut

Data Source: ESS

Table 43 PROJECTED POPULATION (1/3)

District	Area	1981	1986	1991	1996	2001
<u>Chon Buri Province</u>						
A.M. Chon Buri	Chon Buri M. /1	92,500	103,300	115,600	133,500	154,700
	Saen Suk	41,300	44,900	47,500	51,400	56,100
	Rural	30,800	31,900	32,300	32,000	30,200
	Sub-total	164,600	180,100	195,400	216,900	241,000
A. Phanat Nikhom	Phanat Nikhom M.	13,500	13,800	14,200	14,500	14,900
	Tha Bun Mi	4,900	5,700	6,200	6,600	6,900
	Rural	109,800	113,100	114,400	113,600	107,700
	Sub-total	128,200	132,600	134,800	134,700	129,500
K.A. Bo Thong	Bo Thong	2,300	2,700	3,000	3,200	3,400
	Rural	23,500	27,550	30,800	33,050	34,700
	Sub-total	25,800	30,250	33,800	36,250	38,100
A. Phan Thong	Phan Thong	3,900	4,000	4,100	4,200	4,300
	Nong Tamlung	9,800	10,050	10,300	10,350	10,800
	Rural	22,000	22,900	23,100	22,550	20,400
	Sub-total	35,700	36,950	37,500	37,300	35,500
A. Ban Bung	Ban Bung	6,000	6,200	6,300	6,500	6,600
	Hua Kun Jae	3,700	3,800	3,900	4,000	4,100
	Rural	68,200	76,400	83,800	84,900	80,000
	Sub-total	77,900	86,400	94,000	95,400	90,700
K.A. Nong Yai	Nong Yai	3,200	3,700	4,000	4,300	4,500
	Rural	14,100	16,550	18,700	20,050	21,100
	Sub-total	17,300	20,250	22,700	24,350	25,600
A. Si Racha	Si Racha M.	19,500	50,350	71,750	103,100	154,100
	Ao Udom	13,100				
	Bang Phra	7,600				
	Rural	66,900	74,100	80,550	82,050	76,950
	Sub-total	107,500	124,450	152,300	185,150	231,050

/1: Includes Bang Sai SD and Saen Suk SD

Table 43 PROJECTED POPULATION (2/3)

District	Area	1981	1986	1991	1996	2001
A. Bang Lamung	M. Pattaya	36,500	51,350	67,900	85,800	102,950
	Bang Lamung	7,700	8,700	9,600	10,900	12,250
	Huai Yai	13,300	14,100	14,850	15,450	15,850
	Rural	24,900	28,200	31,150	31,500	28,150
	Sub-total	82,400	102,350	123,500	143,650	159,200
K.A. Ko Sichang	Ko Sichang	2,500	2,600	2,650	2,600	2,500
	Sub-total	2,500	2,600	2,650	2,600	2,500
A. Sattahip	Sattahip	18,800	21,500	24,400	25,300	25,800
	Rural	71,800	79,700	86,700	88,000	83,700
	Sub-total	90,600	101,200	111,100	113,300	109,500
<u>Rayong province</u>						
A.M. Rayong	Rayong M.	37,300	42,100	50,750	64,350	83,150
	Map Ta Phut	7,400	13,300	19,350	26,300	35,950
	Ban Phe	9,600	12,100	16,300	19,200	23,500
	Rural	66,600	69,150	70,150	69,950	68,450
	Sub-total	120,900	136,650	156,550	179,800	211,050
K.A. Ban Chang	Ban Chang	14,400	15,100	15,900	16,500	16,900
	Rural	13,100	13,550	13,150	12,850	12,000
	Sub-total	27,500	28,650	29,050	29,350	28,900
A. Ban Khai	Ban Khai	5,200	6,100	6,800	7,300	7,700
	Rural	64,500	72,200	79,550	83,000	85,850
	Sub-total	69,700	78,300	86,350	90,300	93,550
A. Pluak Daeng	Pluak Daeng	1,400	1,600	1,700	1,800	1,900
	Chomphon Chaophraya	2,100	2,300	2,600	2,700	2,800
	Rural	21,700	24,300	26,800	28,000	28,900
	Sub-total	25,200	28,200	31,100	32,500	33,600

Table 43 PROJECTED POPULATION (3/3)

District	Area	1981	1986	1991	1996	2001
K.A. Wang Chan	Rural	12,300	13,700	15,100	15,800	16,400
	Sub-total	12,300	13,700	15,100	15,800	16,400
A. Klaeng	Thong Khwien M.	14,700	17,300	18,900	20,300	21,300
	Pak Nam Prasae	6,400	7,200	7,900	8,300	8,500
	Thung Khwai Kin	3,700	4,100	4,600	4,800	4,900
	Rural	71,300	79,900	88,150	92,000	95,000
	Sub-total	96,100	108,500	119,550	125,400	129,700
Grand Total		1,084,200	1,211,150	1,345,450	1,462,750	1,575,850

Data Source: ESS

Table 44 PROJECTED POPULATION IN DEVELOPMENT AREA

Development Area	Projected Population (10 ³)				
	1981	1986	1991	1996	2001
(Chon Buri Province)					
Chon Buri DA	134	148	163	184	211
Laem Chabang DA ^{/1}	69	82	106	139	190
Pattaya DA	37	51	68	86	103
Sattahip DA	19	22	24	25	26
(Rayong Province)					
Rayong DA ^{/1} ^{/2}	74	86	101	122	150
Ban Phe DA	10	12	16	19	24
Total	342	401	479	576	703

^{/1} : includes rural area

^{/2} : includes Map Ta Phut

Data Source : ESS

Table 45 GROWTH RATE OF INTERNATIONAL ARRIVAL
AND OVERNIGHT DOMESTIC ARRIVAL

	Year					Unit: %
	1976-1981	1981-1986	1986-1991	1991-1996	1996-2001	
	International Arrival in Thailand	12.9 ^{/1}	8.5	7.0	6.0	5.0
International Arrival in the Region	N.A.	8.5	7.0	6.0	5.0	
Overnight Domestic Arrival in the Region	N.A.	8.5	7.0	6.0	5.0	

^{/1} : Obtained from Table 27

Source : ESS

Table 46 AVERAGE LENGTH OF STAY

	Year						Unit: day
	1979 ^{/1}	1981	1986	1991	1996	2001	
	International Tourists	6.25	6.25	6.75	7.25	7.75	8.25
Domestic Tourists	2.53	2.75	3.30	3.80	4.40	5.00	

Source: ^{/1}; TAT and ESS

Table 47 REGRESSION COEFFICIENT FOR GRP PROJECTION

Province	a	b	r ² / ₁
Chon Buri	67,509	-284,780	0.9991
Rayong	18,622	-78,655	0.9983

1: Correlation coefficient

Remarks : Regression formula : $Y_n = a \cdot \ln X + b$

where, Y_n : GRP at 1972 constant price (฿ 10⁶)

X : Year

Number of data : 7 (from 1975 to 1981)

Table 48 PROJECTED GROWTH RATE OF GRP (NATURAL GROWTH)

Province	Annual Growth Rate of GRP (%)				
	1981- 1986	1986- 1991	1991- 1996	1996- 2001	1981- 2001
Chon Buri	6.1	4.4	3.4	2.8	4.2
Rayong	6.5	4.5	3.5	2.8	4.3
Region	6.2	4.4	3.4	2.8	4.2

Table 49 LABOUR PRODUCTIVITY OF INDUSTRY IN BANGKOK METROPOLIS

Industry	Value Added (฿ 10 ⁶)/1	Employee (person)	Value Added per Employee (฿ 10 ³ /person)
Food	13,643	65,970	206.8
Textile	9,151	214,170	42.7
Wood	1,143	14,370	79.6
Pulp	1,274	24,525	52.0
Chemical	12,908	45,401	284.3
Ceramic	4,699	30,852	152.3
Iron	1,257	14,253	88.2
Metal/Machinery	8,829	71,757	123.1
Others	298	3,984	59.9
Total	53,796	493,712	109.0

/1 : 1975 price

Remarks : Statistics of factories with more than 20 employees in Bangkok Metropolis in 1975

Data Source : MOI

Table 50 BASIC UNIT OF LABOUR PRODUCTIVITY FOR PROJECTION

Industrial Zone	Value Added per Employee ($\text{P } 10^3/\text{person}$)/ <u>1</u>	Types of Industry/ <u>2</u>
Chon Buri	61.4	Food, Textile and Metal/ Machinery
Laem Chabang	61.4	Food, Textile and Metal/ Machinery
Rayong	122.7	Food
Map Ta Phut	170.8	Chemical
Sattahip	85.6	Metal/Machinery

1: Value added per employee in 1981 at 1972 price

2: Types of industry are identified based on proposed industrial development mentioned in the Section 3.2.2

Table 51 PROJECTED GRP (DEVELOPMENT GROWTH)

Province	GRP (฿ 10 ⁶)/ ¹				
	1981	1986	1991	1996	2001
(Industry)					
Chon Buri	0	259	968	1,943	3,671
Rayong	0	676	1,420	2,208	3,449
Region	0	934	2,389	4,151	7,120
(Tourism)					
Chon Buri	0	258	696	1,121	1,782
Rayong	0	48	186	398	768
Region	0	307	882	1,519	2,550
(Total)					
Chon Buri	0	517	1,664	3,064	5,453
Rayong	0	724	1,606	2,606	4,216
Region	0	1,241	3,270	5,670	9,669

¹ : 1972 constant price

Table 52 PROJECTED GRP (OVERALL GROWTH)

Origin	Increment of GRP (₪ 10 ⁶)/ ¹				
	1981- 1986	1986- 1991	1991- 1996	1996- 2001	1981- 2001
<u>Chon Buri province</u>					
Natural Growth	4,062	3,815	3,611	3,427	14,915
Development Growth	517	1,147	1,400	2,389	5,453
Sub-total	4,579	4,962	5,011	5,816	20,368
<u>Rayong Province</u>					
Natural Growth	1,159	1,053	996	945	4,153
Development Growth	724	882	1,000	1,610	4,216
Sub-total	1,883	1,935	1,996	2,555	8,369
<u>Region</u>					
Natural Growth	5,221	4,868	4,607	4,372	19,068
Development Growth	1,241	2,029	2,400	3,999	9,669
Total	6,462	6,897	7,007	8,371	28,737

¹ : 1972 constant price

Table 53 PROJECTED GROWTH RATE OF GRP AND PER CAPITA GRP

Province	Average Annual Growth Rate (%)				
	1981- 1986	1986- 1991	1991- 1996	1996- 2001	1981- 2001
<u>GRP</u>					
Chon Buri	6.7	5.4	4.3	4.1	5.1
Rayong	9.9	6.7	5.2	5.2	6.7
Region	7.4	5.7	4.5	4.3	5.5
<u>Per Capita GRP</u>					
Chon Buri	4.4	3.2	2.5	2.6	3.2
Rayong	7.4	4.5	3.6	3.5	4.7
Region	5.1	3.5	2.8	2.8	3.5

FIGURES

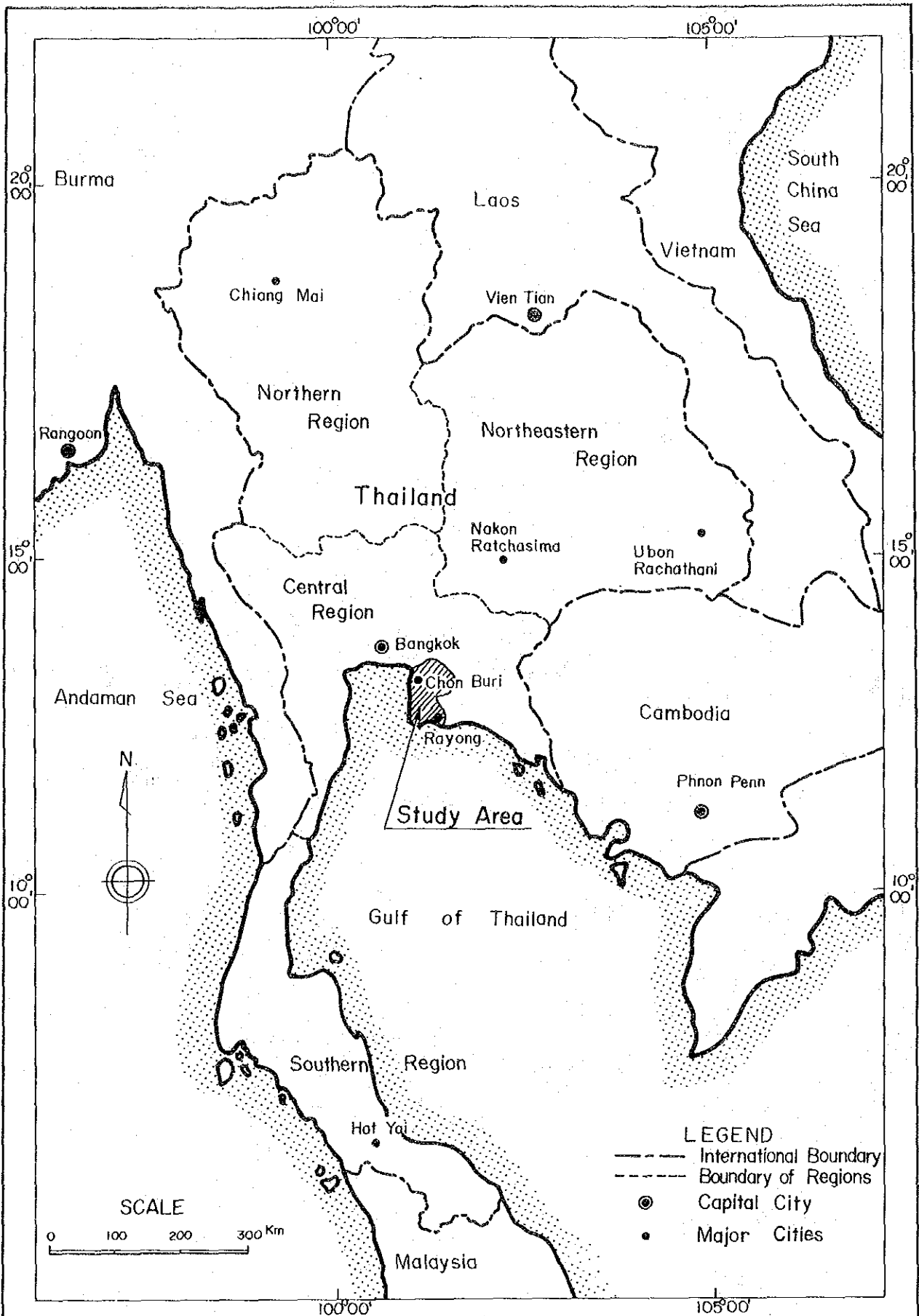
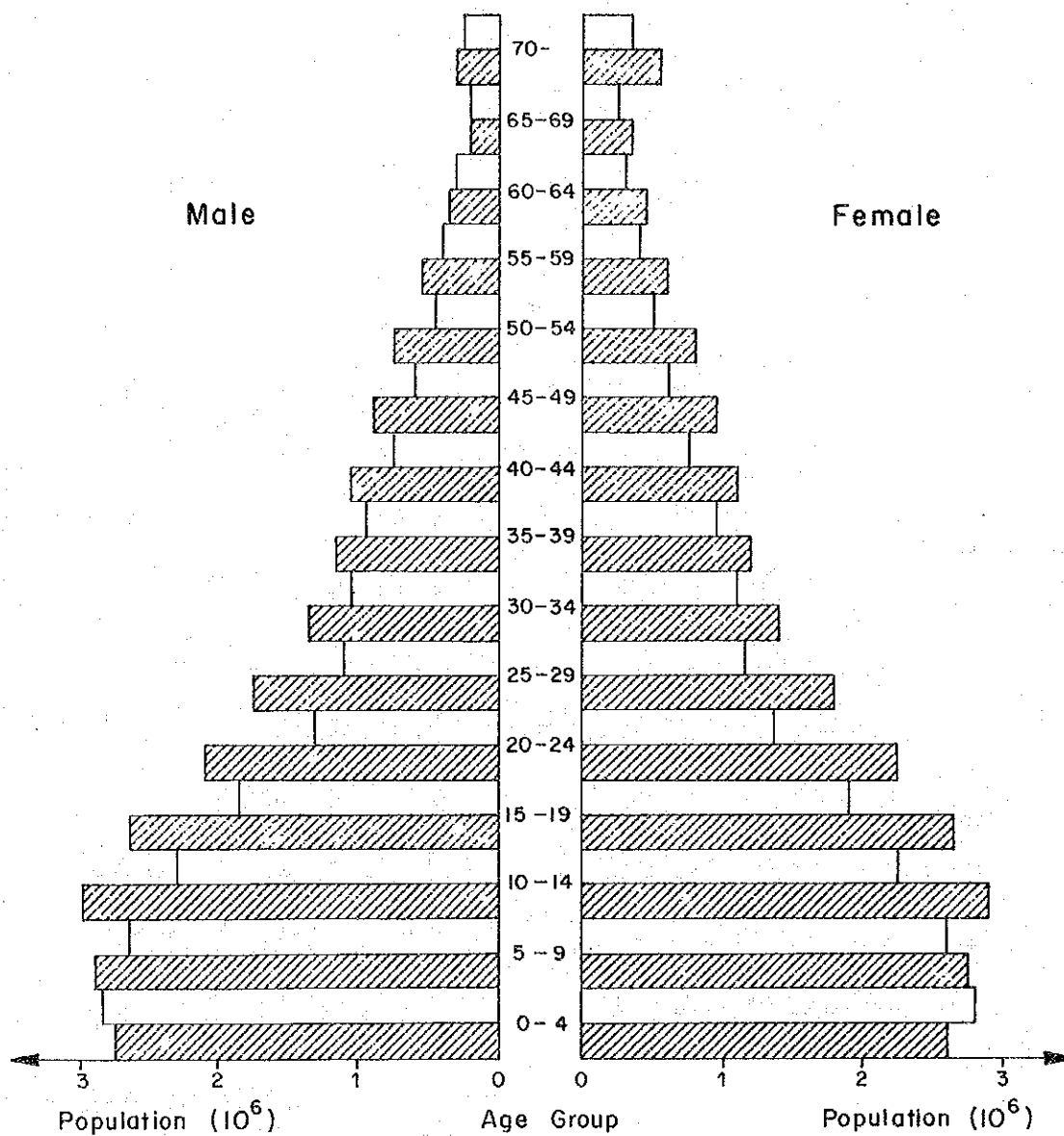


Fig. 1 Map of Thailand

KINGDOM OF THAILAND
 THE EAST COAST WATER RESOURCES
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 JAPAN INTERNATIONAL COOPERATION AGENCY



LEGEND

- 1970
- 1980

Fig. 2. Age Distribution of Population in Thailand.

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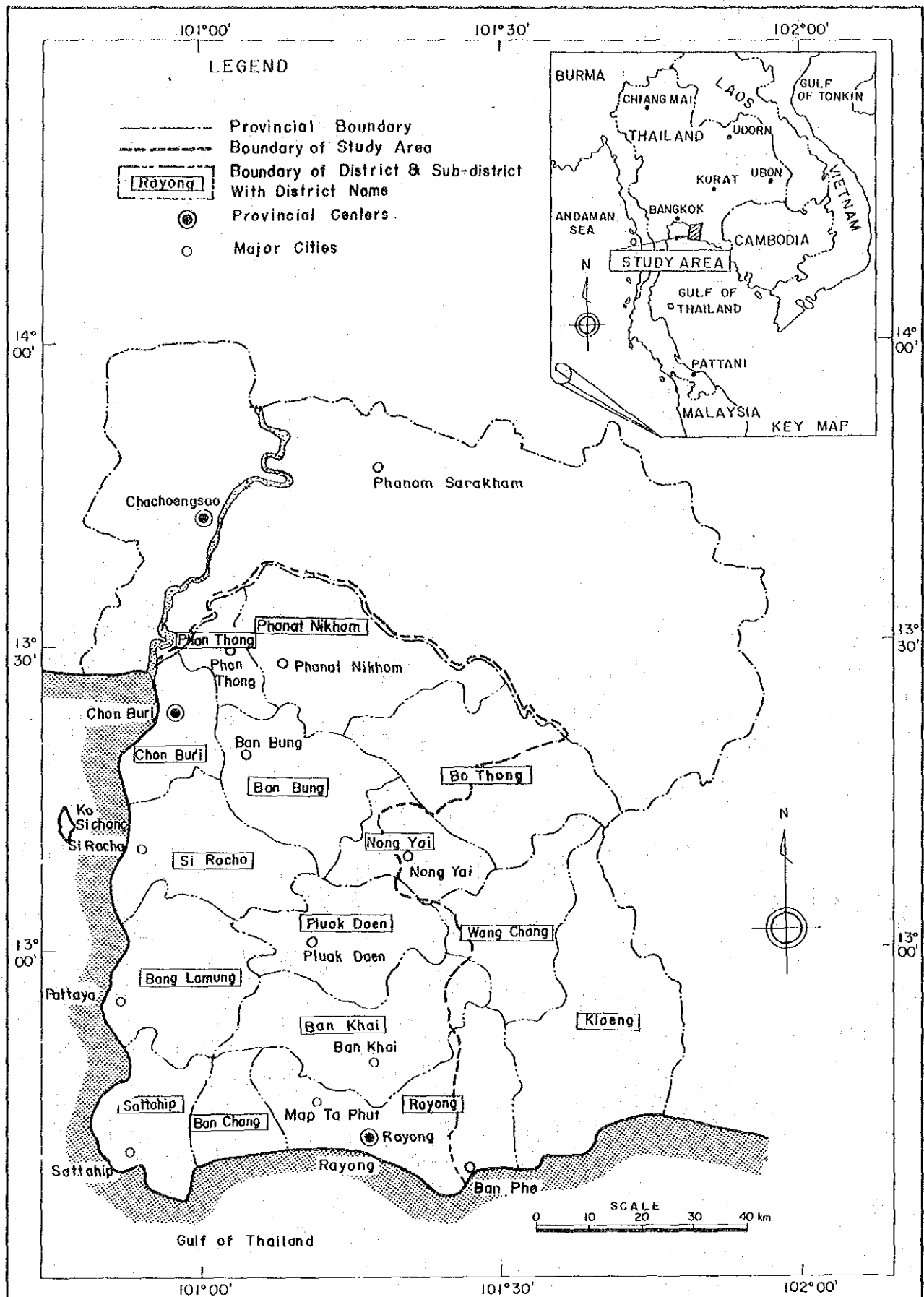


Fig. 3 Administrative Division

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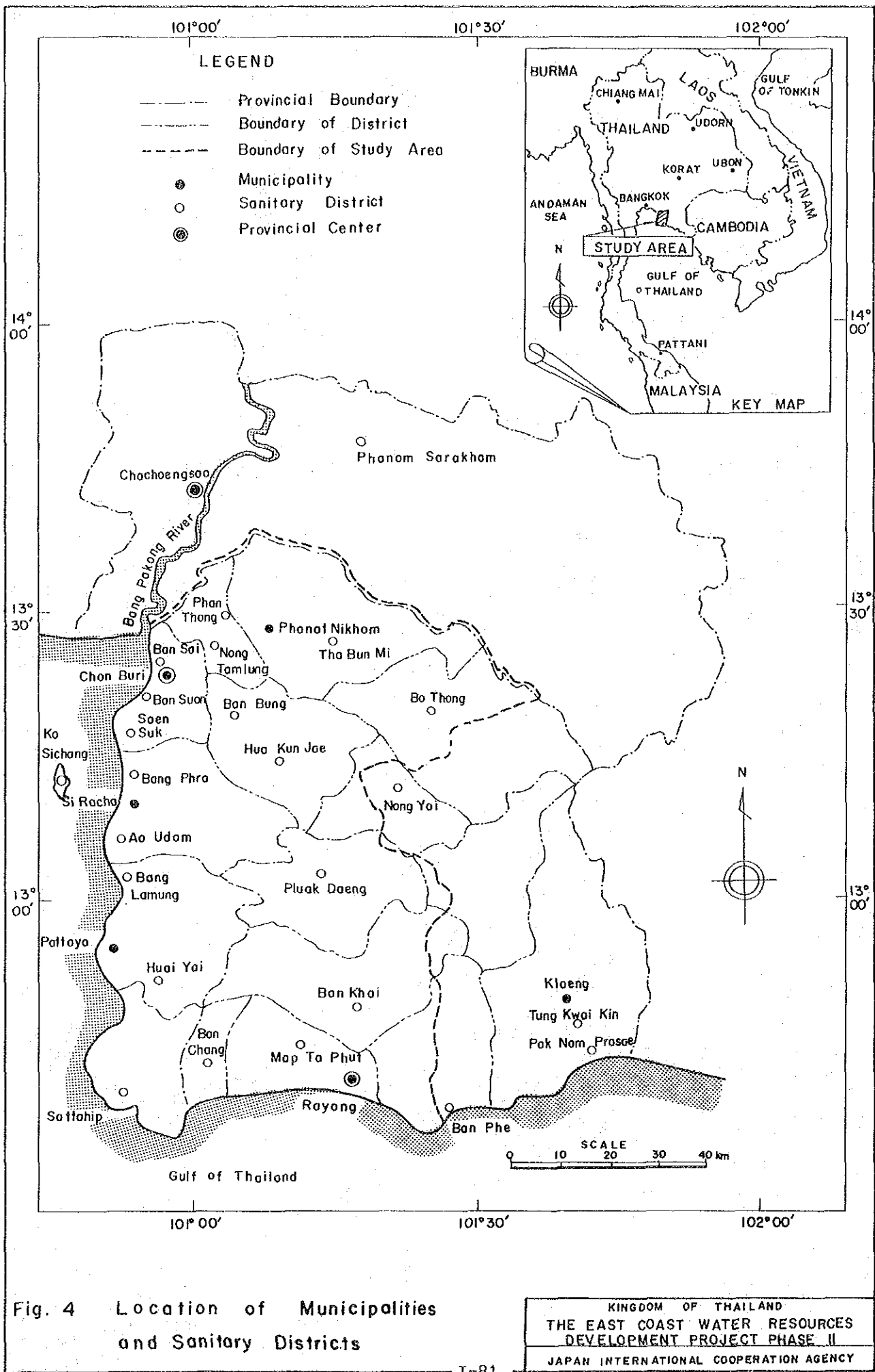


Fig. 4 Location of Municipalities and Sanitary Districts

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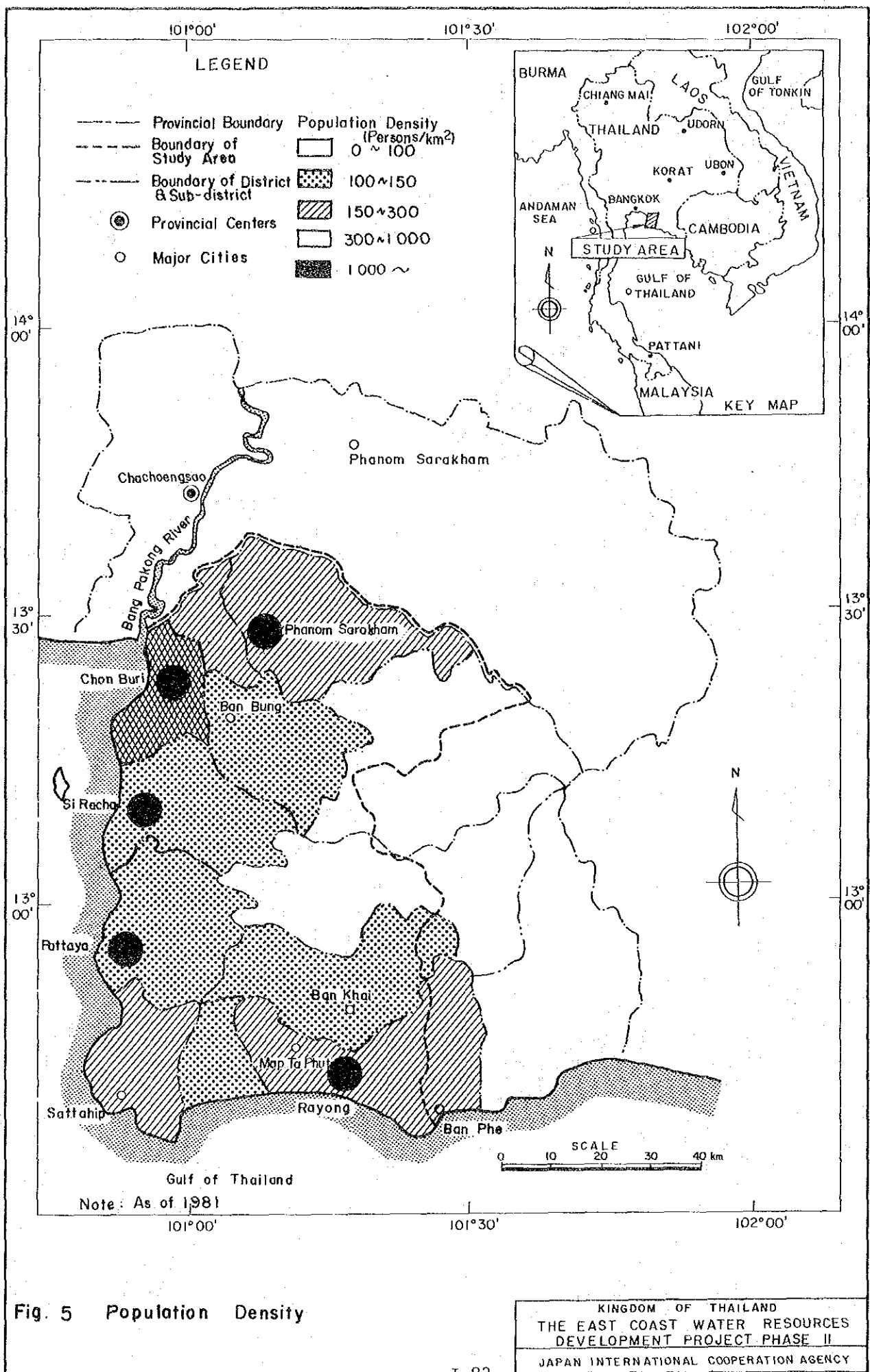


Fig. 5 Population Density

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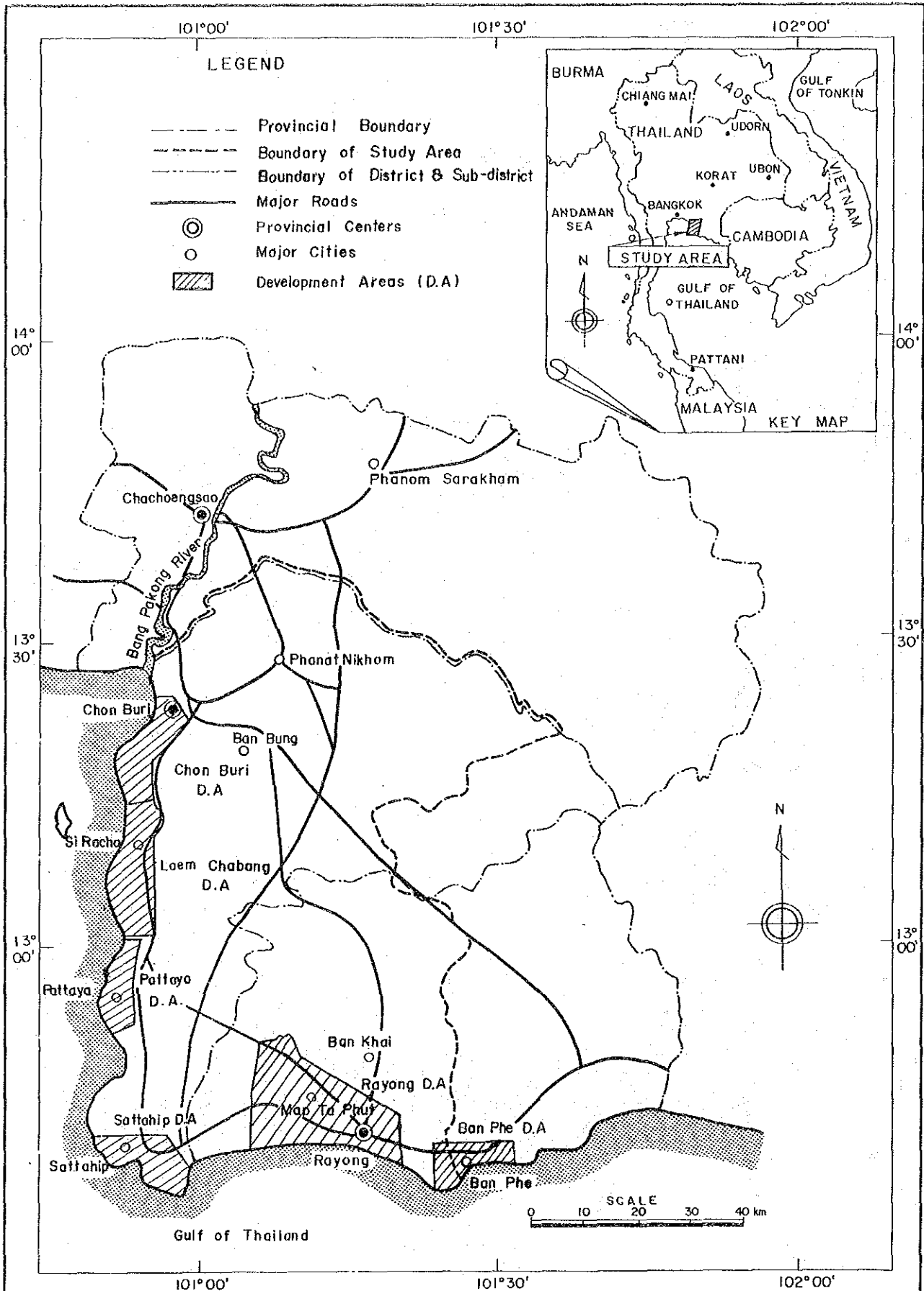


Fig. 6 Location of Development Areas

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