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United Nations Industrial Development Organization

PRE-INVESTMENT STUDIES
ON
PROMOTION OF SUPPORTING INDUSTRIES IN THAILAND
(US/THA/90/040)
Kingdom of Thailand

TERMINAL REPORT

Volume II

- Part I National Industrial Location Guideline**
Part II Industrial Re-location Program in Bangkok

Prepared by the

United Nations Industrial Development Organization

Based on the work of

ENGINEERING CONSULTING FIRMS ASSOCIATION, JAPAN

JAPAN DEVELOPMENT INSTITUTE

FEBRUARY 1993

Backstopping Officer: Michael Davidsen, Feasibility Studies Branch

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Introduction

Thailand has achieved a rapid economic growth in the 1980s. In the course of development, significant structural change and diversification took place. She has adopted outward-looking strategy for industrialization. Foreign investment has been welcomed to the country and export-oriented industries have played an important role as an engine of growth.

Local supporting industries, such as parts/components manufacturers and sub-contracting firms, assume critical importance in generating self-sustaining industrial development and promoting small and medium enterprise development. UNIDO agreed to provide study fund for promotion of supporting industries under the title 'Promotion of Supporting Industries in Thailand' in 1988 and Engineering Consulting Firms Association of Japan (ECFA) was selected as a consultant for the project. As a continuing effort, 'Pre-Investment Studies on Promotion of Supporting Industries in Thailand' has been conducted by ECFA under the supervision of UNIDO.

In this project, two sub-sector studies have been conducted on aluminum die-casting and surface treatment. The selection of the sub-sectors were determined through the discussions of UNIDO, Ministry of Industry in Thailand, and ECFA during the first visit to Thailand by the ECFA team in January, 1992. Along with the sub-sector study part, the studies on nationwide industrial location and relocation of industries from overconcentrated Bangkok constituted the other important component.

The two sub-sector studies, including macro analysis of supporting industries, are in this volume (Volume I). The studies on national industrial location and relocation program in Bangkok are in another volume (Volume II).

The members of ECFA team were:

Shoichi Kobayashi (team leader)	Economist, Regional Planner
Hachiro Ida	Engineering Economist, Regional Development
Takafumi Ueda	Industrial Economist, Environmental Management
Seth Sulkin	Policy Analyst
Myles Elledge	Institutional Development
Takenosuke Kuroda	Market Analyst

During the study, the team conducted extensive interviews with a large number of officials from various offices of the government. Also a survey of enterprises in Bangkok and its vicinity has been conducted with the help of Industrial Development Division, Department of Industrial Promotion, Ministry of Industry.

We would like to express deep appreciation to the following institutions for their kind cooperation and encouragement for our difficult task; UNIDO/Thailand, Department of Industrial Promotion, Department of Industrial Works, Office of Industrial Economics in Ministry of Industry, Industrial Planning Section in National Economic and Social Development

Board, Industrial Estate Authority of Thailand, Office of National Environmental Board, Office of the Board of Investment, Department of Treasury in Ministry of Finance, Policy and Planning Division in Bangkok Metropolitan Administration, Department of Town and Country Planning in Ministry of Interior, Business Promotion Department in the Industrial Finance Corporation of Thailand, the Federation of Thai Industries, Thailand Development Research Institute.

Finally, we appreciate the valuable comments on the first and second draft provided by the Thai government and UNIDO. We tried our best to include these valuable comments into this final version. We hope all interested parties will be satisfied with the final result and that some of the suggestions in the study will be useful for the Thai government in formulating industrial policy, particularly related to supporting industries and relocation away from Bangkok. Japan's Ministry of International Trade and Industry has just finalized its report on Thai supporting industries, and UNIDO has just agreed to do a feasibility study for Western Seaboard industrial development. Japan's MITI has shown keen interest in carrying out further programs in this field. These projects should help to ensure that the process of policy research contained in this study will be continued for the foreseeable future.

February 1993

Shoichi Kobayashi
Team Leader, ECFA

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GLOSSARIES OF ACRONYMS

BMA	Bangkok Metropolitan Area Bangkok Metropolitan Administration
BMR	Bangkok Metropolitan Region
BOI	Board of Investment
CCDP	Clean Center Development Program
CMTCDP	Chaing Mai Techno-City Development Program
DIP	Department of Industrial Promotion, Ministry of Industry
DIW	Department of Industrial Works, Ministry of Industry
ESB	Eastern Seaboard
ESBDP	Eastern Seaboard Development Program
GRP	Gross Regional Product
IEAT	Industrial Estate Authority of Thailand
IFCT	Industrial Finance Corporation of Thailand
MOI	Ministry of Industry
NEBCDP	Northeast Border City Development Program
NESDB	National Economic and Social Development Board
NIEs	Newly Industrialized Economies
OECD	Organization of Economic Co-operation and Development
ONEB	Office of National Environmental Board
PEDC	Provincial Economic Development Corporation
REDC	Regional Economic Development Center
RUGCDP	Regional Urban Growth Center Development Program
SFEZDP	Southern Free Economic Zone Development Program
SIFCT	Small Industry Financial Corporation of Thailand
SMEs	small and medium enterprises
SB	Southern Seaboard
TDRI	Thailand Development Research Institute
UIMP	Urban Industry Modernization Program
UNDP	United Nations Development Programme
WSB	Western Seaboard
WSBDP	Western Seaboard Development Program

Volume II
Part I National Industrial Location Guideline

I. Industrial Development in Thailand

1.1 Overview

Thailand has a remarkably strong record of economic performance over the long run, especially high in recent years. One obvious trend in the development is that industrial sector has been gaining importance compared to the used-to-be dominating agriculture, in terms of value added or trade volume. The value added originated from agriculture sector was surpassed by that of industrial sector (manufacturing, mining, construction and utilities) in 1978, and by manufacturing sector in 1981. Currently, the manufacturing sector constitutes about one-fourth of the country's total value added.

Table 1-1 GDP and Manufacturing Sector GDP at 1972 Constant Prices (1981-90)

	(Baht bin)						
	1981	1985	1986	1987	1988	1989	1990
Total GDP	318	394	413	453	512	574	632
Growth Rate		5.5%	4.5%	9.5%	13.4%	12.2%	10.0%
Manufacturing	69	81	90	102	119	137	156
Growth Rate		4.1%	10.8%	13.3%	16.8%	14.9%	13.7%
Sector Share		20.6%	21.8%	22.5%	23.2%	23.9%	24.7%

Source: National Accounts Division, NESDB

Thai exports expanded remarkably with annual growth rate of 25 percent during 1985-90. Thai exports are benefiting from strong investment in the past several years. During 1988-90, Japan and newly industrializing countries relocated their production bases to Thailand, resulting in the mushrooming of factories on Thailand. As the majority of these plants are export-oriented, Thai exports grow accordingly. Of the top 20 export items, 15 were manufactured products, four agriculture products and one fishery product. This situation reflects the strong dominance of manufactured exports on overall exports.

The impact of technological dependency of Thai industries is the entailed imports of machinery, major components, and raw materials. Even during the current export boom, imports of capitals and machinery are still high and increasing. As a result, Thailand is again experiencing the rapidly increasing trade deficit in machinery and raw materials. This reflects the fact that the current investments, consisting also of the rapidly resuming foreign investment since 1987, still rely on imported technology.

Foreign direct investment (FDI) is clearly one of the major contributor for Thai's recent economic boom. Over the past several years, FDI has grown rapidly.

Table 1-2 Total Exports and Manufacturing Exports (1985-1990)

	(Baht bln)					
	1985	1986	1987	1988	1989	1990
Total Exports	193	233	300	404	516	590
growth rate		20.7%	28.8%	34.7%	27.7%	14.3%
Manufacturing	96	129	188	264	354	440
growth rate		34.4%	45.7%	40.4%	34.1%	24.3%
share	49.7%	55.4%	62.7%	65.3%	68.6%	74.6%
Integrated Circuits		13	15	19	18	22
Textile Products		31	49	59	74	84
Footwear		3	6	10	14	20
Furniture and Parts		2	3	7	10	12
Plastic Products		1	2	5	8	9
Jewelry		5	8	10	12	13

Source: Bank of Thailand

Table 1-3 Imports by Economic Classification (1985-1990)

	(Baht bln)					
	1985	1986	1987	1988	1989	1990
Total Imports	251	241	334	513	663	844
growth rate		-4.0%	38.6%	53.6%	29.2%	27.3%
Intermediate Products and Raw Materials	77	84	120	181	235	281
share	30.7%	34.9%	35.9%	35.3%	35.4%	33.3%
Capital Goods	75	78	106	201	242	328
share	29.9%	32.4%	31.7%	39.2%	36.5%	38.9%
Total Exports	193	233	300	404	516	590
Trade Balance	-58	-8	-34	-109	-147	-254

Source: Bank of Thailand

1.2 Factors of Industrial Development

Several factors were underlying the recent economic impressive double digit growth in GDP. The most important factors may be as follow.

(1) Favorable change in the external environment

Major currencies realignment starting in December 1985 greatly benefited Thai exports, since Baht value, mostly fixed to US dollar, weakened against Yen and major European currencies. A sharp decline of oil prices and recoveries of major crops prices also contributed improvement of balance of trade.

(2) Foreign investment boom especially from Japan and Asian NIEs to Thailand

Because of higher appreciation of Yen and other currencies, and also relocation needs of labor intensive manufacturing industries including of most Asian NIEs, investment in relatively low labor cost countries such as Thailand became more attractive.

(3) Sound macro-economic management and export promotion measures

Effective control of government expenditure and debt management since 1986 contributed to ease the financial problems during 1979-1985. More resources were available for the private investment, which were from strong increase of export.

(4) Political stability

Thailand was relatively politically stable in 1980s. This political stability considerably supported steady economic development and encouraged investment.

1.3 Constraints of Future Development

Thailand has shown remarkable record of economic performance in recent years. In general, the prospects of continued growth are relatively fine. However, a few problems Thai has to be considered in order to sustain stable growth led by strengthening of manufacturing industry, and to obtain the status of a new NIEs member are, among others;

(1) **diversifying and strengthening industrial structure**

Thailand has reached a fairly advanced level of industrial development compared to most other developing countries. However, Thai manufacturing sector is still highly dualistic and lacks a better structural integration. Efficient export industries co-exist with inefficient domestic-market oriented industries, and a limited number of modern large-scale factories with the majority of small traditional companies. The emerging international and national pressures require restructuring of the country's industrial sector towards a more dynamic and competitive yet at the same time more balanced pattern.

(2) **human resource development**

Shortage of skilled workers and engineers have already emerged and constitute a serious impediment for continued industrial growth.

(3) **infrastructure development**

Infrastructure in Bangkok cannot meet the rapid growing demand for public services. Infrastructure in regional area has not been well developed, and it makes manufacturing operation cost higher than that in Bangkok.

(4) **environment management**

Along with Thailand's rapid industrial growth, same growth is placing a major burden on environment. Air and water pollution are growing rapidly and traffic congestion in Bangkok is among the worst in the world. While free market systems have made a major contribution to the Thai economy, it is now evident that total reliance on unbridled private interests will not provide protection for the environment.

(5) **spatially balanced development**

As far as the locational distribution of industrial bases is concerned, it is quite obvious that most industrial firms have tended to locate within Bangkok and surrounding provinces. This has been one of the major causes of the problem of regional disparity.

2. Industrial Development and Bangkok-Regional Imbalance

2.1 Bangkok-Regional Imbalance and Problem

Since the mid-1980s, Thailand has experienced a trend of increasing regional disparities associated with the acceleration in export-led industrial growth. Most of the outlying regions have experienced only modest per capita GRP increases over the past decade. This trend is projected to continue to persist during the Seventh Plan according to TDRI study¹. As it is shown in the Table 2-1, the relative position of each region is almost same during the Seventh Plan as the current situation.

It is expected that by 1996, the BMR's per capita GRP will increase to 338 percent of the national average, up from 330 percent in 1992. It is worth to note that the next five years will see increases in per capita GRP in the eastern region compared to the national average as a result of the completion of the Eastern Seaboard Development Project.

Table 2-1 Past and Future Regional Performance (Per Capita GRP) 1972 Constant Prices (Baht/person)

Region	1989		1992		1996	
	rank	Per Cap	rank	index	Per Cap	index
BMR	1	42,847	1	330	56,668	338
East	2	14,172	2	110	18,892	113
Central	3	10,082	4	77	12,063	72
West	4	10,190	3	78	12,276	73
South	5	7,864	5	60	9,222	55
North	6	7,509	6	57	9,261	55
Northeast	7	4,296	7	33	5,579	33
Average		12,967		100	16,756	100

Source: National Urban Development Policy Framework, Vol 1, Study Area 3, NESDB/UNDP/TDRI, 1991

In the whole economy, industry plays and will play an increasingly important role in the country's development. It is projected that over the next 20 years, the economy will grow at about 7 percent per year, and that the BMR will continue to be the major economic production area of the country. The population in the BMR is expected to increase approximately 2.5 percent per year, in contrast to the country's growth rate of 1.6 percent per year, over the next 20 years.² However, constraints on infrastructure in the BMR represent an important threat to continued economic expansion. The road, telecommunications, water supply and sewerage and transportation in the metropolitan area are strained to capacity and are already responsible for considerable economic losses in the form of congestion and pollution costs.

Table 2-2 Manufacturing GRP at 1972 Prices

Region	(million Baht)					
	1981	1985	1986	1987	1988	1989
BMR	51,478	59,780	66,802	78,044	91,917	104,861
Share	74.5%	73.4%	74.0%	76.3%	76.9%	76.4%
Growth Rate		3.8%	11.7%	16.8%	17.8%	14.1%

¹ National Urban Development Policy Framework, Vol.1 Study Area 3, NESDB/UNDP/TDRI, 1991

² Urbanization and Environment: Managing the Conflict, TDRI, 1990

Northeastern	3,467	4,044	4,730	4,627	5,407	5,864
Share	5.0%	5.0%	5.2%	4.5%	4.5%	4.3%
Growth Rate		3.9%	17.0%	-2.2%	16.9%	8.5%
Northern	2,593	3,340	3,562	3,710	4,154	4,701
Share	3.8%	4.1%	3.9%	3.6%	3.5%	3.4%
Growth Rate		6.5%	6.6%	4.2%	12.0%	13.2%
Southern	1,959	2,004	2,061	2,167	2,317	2,485
Share	2.8%	2.5%	2.3%	2.1%	1.9%	1.8%
Growth Rate		0.6%	2.8%	5.1%	6.9%	7.3%
Eastern	5,237	6,352	6,547	6,766	8,165	9,859
Share	7.6%	7.8%	7.3%	6.6%	6.8%	7.2%
Growth Rate		4.9%	3.1%	3.3%	20.7%	20.7%
Western	2,044	2,743	3,220	3,395	3,714	4,722
Share	3.0%	3.4%	3.6%	3.3%	3.1%	3.4%
Growth Rate		7.6%	17.4%	5.4%	9.4%	27.1%
Central	2,351	3,199	3,340	3,579	3,790	4,768
Share	3.4%	3.9%	3.7%	3.5%	3.2%	3.5%
Growth Rate		8.0%	4.4%	7.2%	5.9%	25.8%
Total	69,129	81,462	90,262	102,288	119,464	137,260
Share	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Growth Rate		4.2%	10.8%	13.3%	16.8%	14.9%

Source: NESDB

2.2 Characteristics of Industries in Bangkok and Regional Area

Most of industrial activities in Thailand are concentrated in Bangkok and neighboring provinces, while the level of industrial development in other provinces is relatively low. In 1989, 76.4 percent of manufacturing value added was generated in Bangkok Metropolitan Region (BMR)¹, while the share of population is only 16 percent.

The effects of Bangkok's industrialization are no longer limited to the five adjacent provinces (within BMR), but the industrial expansion of Bangkok is spreading beyond BMR to the provinces of Ayutthaya and Saraburi in the north, Ratchaburi and Phetchaburi to the west, and along the coast towards the east, including provinces of Chon Buri, Chachoengsao and Rayong.

As it is shown in Table 2-3 and 2-4, there is generally a lack of diversification of industrial activities in provincial areas. Industrial sectors commonly found in regional areas include food, wood products, non-metallic mineral products, metal products and machinery, and transport equipment.

¹ BMR consists of Bangkok Metropolis and five neighboring provinces; Samut Prakan, Pathum Thani, Samut Sakhon, Nakhon Pathom and Nonthaburi.

Table 2-3 Sectoral Distribution of Registered Factories by Region, 1987

							(%)
TSIC	Subsector	BMR	Central	North	North-east	South	TOTAL
311	Food	6.80%	36.30%	19.90%	47.80%	18.50%	17.20%
313	Beverage	0.30%	0.50%	0.90%	0.30%	0.50%	0.40%
314	Tobacco	0.00%	0.00%	6.50%	0.00%	0.00%	0.60%
321	Textiles	5.20%	1.00%	0.40%	1.20%	0.30%	3.40%
322	Wearing Apparel	5.80%	0.00%	0.70%	0.10%	0.00%	3.60%
323	Leather	1.20%	0.00%	0.00%	0.00%	0.00%	0.70%
324	Footwear	1.00%	0.00%	0.00%	0.00%	0.00%	0.60%
331	Wood Products	5.70%	9.80%	9.40%	4.10%	13.00%	6.90%
332	Furniture	2.90%	1.40%	2.70%	2.90%	3.80%	2.80%
341	Paper Products	1.50%	0.20%	0.30%	0.00%	0.10%	1.00%
342	Printing and Publishing	5.80%	1.50%	1.90%	1.70%	2.40%	4.20%
351	Industrial Chemicals	0.50%	0.30%	0.20%	0.00%	0.10%	0.40%
352	Other Chemical Products	2.80%	0.40%	1.20%	0.30%	0.40%	1.90%
353	Petroleum Refineries	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
354	Petroleum and Coal Prod.	0.10%	0.00%	0.00%	0.00%	0.00%	0.10%
355	Rubber Products	1.60%	2.30%	2.50%	1.90%	5.50%	2.00%
356	Plastic Products	6.00%	0.10%	0.20%	0.30%	0.50%	3.60%
361	Pottery	0.20%	1.30%	2.00%	0.20%	0.40%	0.60%
362	Glass Products	0.20%	0.00%	0.00%	0.00%	0.00%	0.10%
369	Other Nonmetallic Min. Prod.	1.30%	6.70%	6.90%	6.90%	8.40%	3.60%
371	Iron and Steel	0.60%	0.10%	0.10%	0.10%	0.30%	0.40%
372	Nonferrous Metal	1.20%	0.10%	0.30%	0.00%	0.10%	0.80%
381	Fabricated Metal Products	20.90%	3.20%	4.70%	4.10%	4.30%	14.10%
382	Machinery	9.50%	15.10%	20.00%	10.60%	19.50%	12.00%
383	Electrical/Electronics Prod.	3.20%	0.90%	1.30%	0.60%	0.60%	2.20%
384	Transport Equipment	5.70%	5.70%	5.10%	5.10%	4.30%	5.50%
385	Professional/Scientific Equip.	0.40%	0.00%	0.00%	0.00%	0.00%	0.30%
390	Others	9.40%	12.90%	13.00%	11.80%	17.00%	11.00%
TOTAL		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Provincial Factory Directories, MOI

Table 2-4 Regional Distribution of Registered Factories by Sector, 1987

		(%)					
TSIC	Subsector	BMR	Central	North	North-east	South	TOTAL
311	Food	23.60%	31.40%	9.90%	28.00%	7.10%	100.00%
313	Beverage	47.80%	17.20%	18.30%	7.80%	8.90%	100.00%
314	Tobacco	3.10%	0.30%	96.70%	0.00%	0.00%	100.00%
321	Textiles	90.30%	4.50%	1.10%	3.40%	0.70%	100.00%
322	Wearing Apparel	98.10%	0.10%	1.60%	0.20%	0.00%	100.00%
323	Leather	99.50%	0.20%	0.00%	0.30%	0.00%	100.00%
324	Footwear	99.00%	1.00%	0.00%	0.00%	0.00%	100.00%
331	Wood Products	48.80%	21.10%	11.70%	6.00%	12.40%	100.00%
332	Furniture	63.80%	7.80%	8.50%	10.80%	9.20%	100.00%
341	Paper Products	93.10%	3.00%	2.50%	0.40%	1.00%	100.00%
342	Printing and Publishing	82.60%	5.40%	3.90%	4.20%	3.80%	100.00%
351	Industrial Chemicals	85.20%	10.00%	3.50%	0.00%	1.20%	100.00%
352	Other Chemical Products	88.00%	3.30%	5.60%	1.60%	1.40%	100.00%
353	Petroleum Refineries	0.00%	63.40%	36.60%	0.00%	0.00%	100.00%
354	Petroleum and Coal Prod.	81.90%	10.20%	4.40%	0.00%	3.40%	100.00%
355	Rubber Products	45.80%	16.50%	10.50%	9.40%	17.80%	100.00%
356	Plastic Products	97.50%	0.50%	0.40%	0.70%	0.90%	100.00%
361	Pottery	25.50%	35.60%	30.10%	4.00%	4.80%	100.00%
362	Glass Products	98.60%	1.40%	0.00%	0.00%	0.00%	100.00%
369	Other Nonmetallic Min. Prod.	21.80%	27.50%	16.30%	19.20%	15.30%	100.00%
371	Iron and Steel	89.90%	2.10%	1.00%	2.70%	4.30%	100.00%
372	Nonferrous Metal	93.80%	1.90%	3.10%	0.50%	0.60%	100.00%
381	Fabricated Metal Products	88.80%	3.40%	2.80%	3.00%	2.00%	100.00%
382	Machinery	47.40%	18.70%	14.40%	8.90%	10.70%	100.00%
383	Electrical/Electronics Prod.	84.60%	6.20%	5.00%	2.60%	1.70%	100.00%
384	Transport Equipment	62.10%	15.40%	8.00%	9.30%	5.10%	100.00%
385	Professional/Scientific Equip.	96.80%	2.20%	1.00%	0.00%	0.00%	100.00%
390	Others	51.30%	17.50%	10.20%	10.80%	10.20%	100.00%
Total		59.80%	14.90%	8.60%	10.10%	6.60%	100.00%

Source: Provincial Factory Directories, MOI

3. Industrial Development Strategies in the Seventh Plan

3.1 Previous Five-year Plans

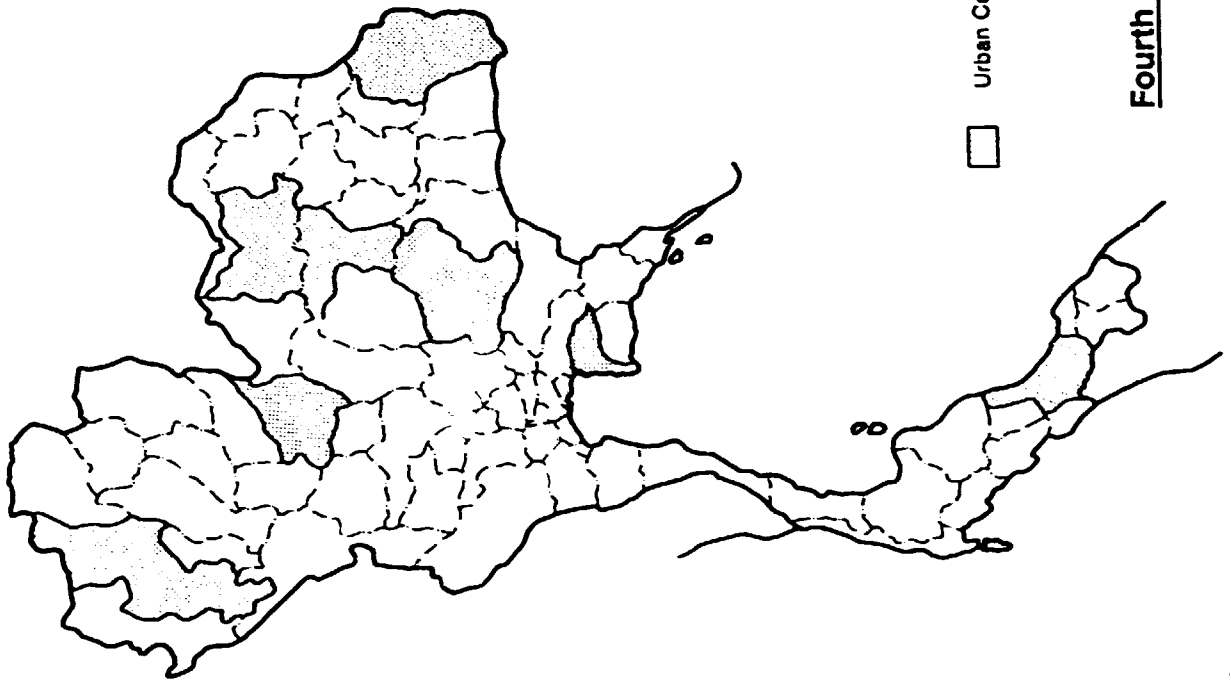
The major policy goals of national development have been described in a series of the Five-year National Social and Economic Development Plans since 1961. It was the Third Plan (1972-76) which explicitly mentioned the industrial development in regional areas. It stated that development plans should be prepared for the creation of regional growth center in the North and Northeast.

The Fourth Plan made the industrial decentralization measures more explicit and identified a number of measures to encourage industrial manufacturers to locate outside Bangkok and the inner ring. These included the provision of increased privileges to firms locating outside Bangkok and the inner ring and reduced privileges to those inside them, the reduction of transport and electricity costs, and the provision of financial assistance through IFCT and SIFO.

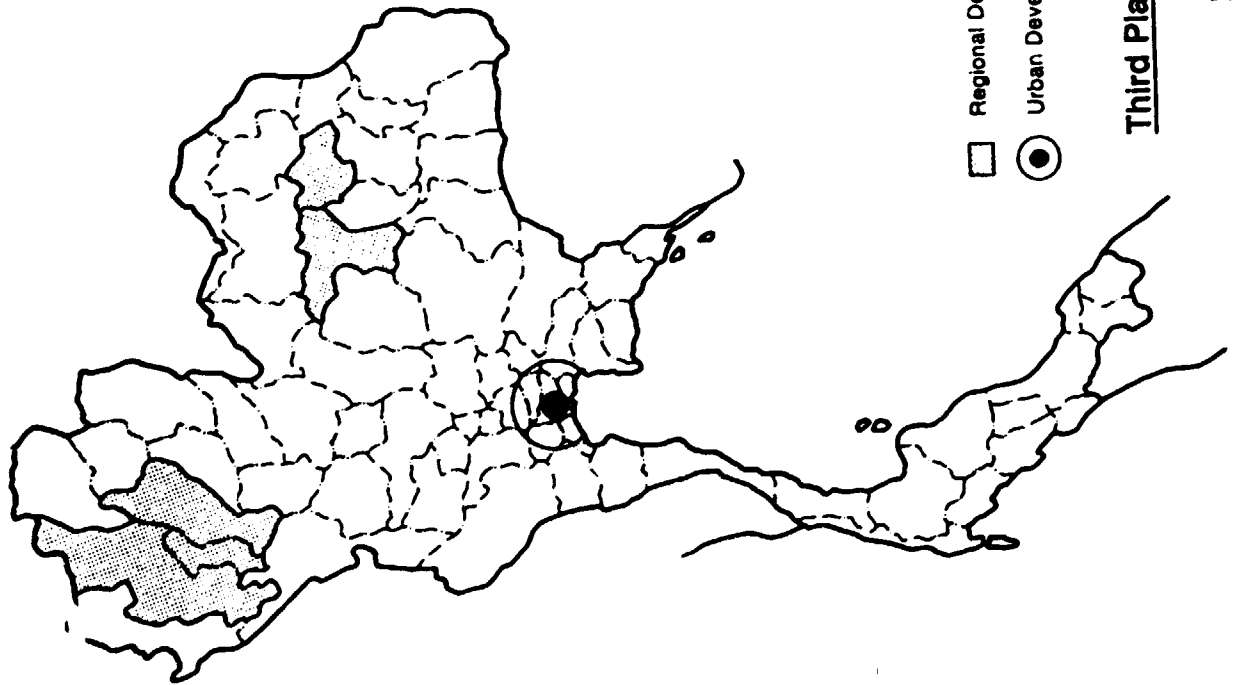
The Fifth and Sixth Plans were less explicit than the previous two plans with respect to the measures for regional industrialization. Both plans targeted regional and small-scale industries for special promotion. The Fifth Plan mentioned the Eastern Seaboard regional development program for the first time.

In the Sixth Plan, more emphasis were put to increase the efficiency and orderliness of growth than the measures to control the growth of the capital areas. This is to be achieved by improving cost recovery system, strengthening the management of state enterprises and better infrastructure management.

The government has been trying to promote regional industries by growth pole approach, emphasizing the promotion of regional core cities to serve as alternatives to migration to Bangkok. These programs have been carried out by the Ministry of Interior. While socio-economic infrastructure such as sewage, garbage disposal and water has been improved, less emphasis has been put on economic infrastructure and urban planning. The following maps show the regional development centers in each Five-year Plan. So far, the effect of the program on location decisions of companies appears to be minimal. This is not only because these regional cities have not be well prepared to accommodate new industries from Bangkok or abroad. But because the demand of regional industrial location has been marginal.



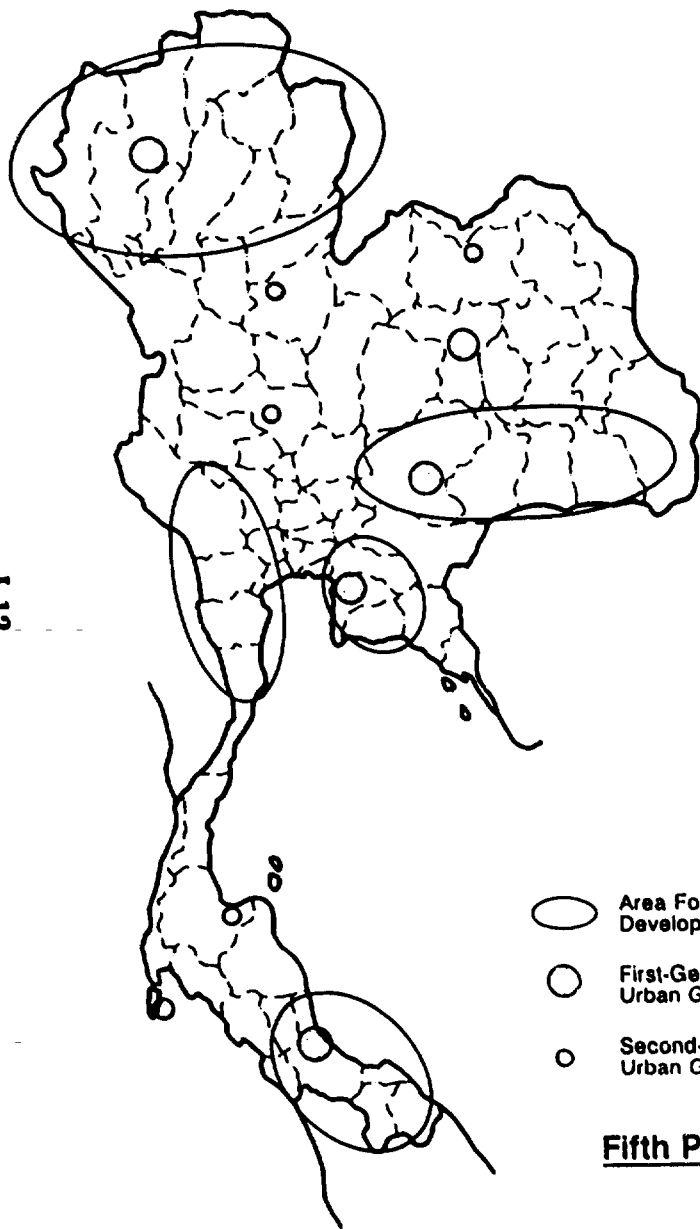
Fourth Plan



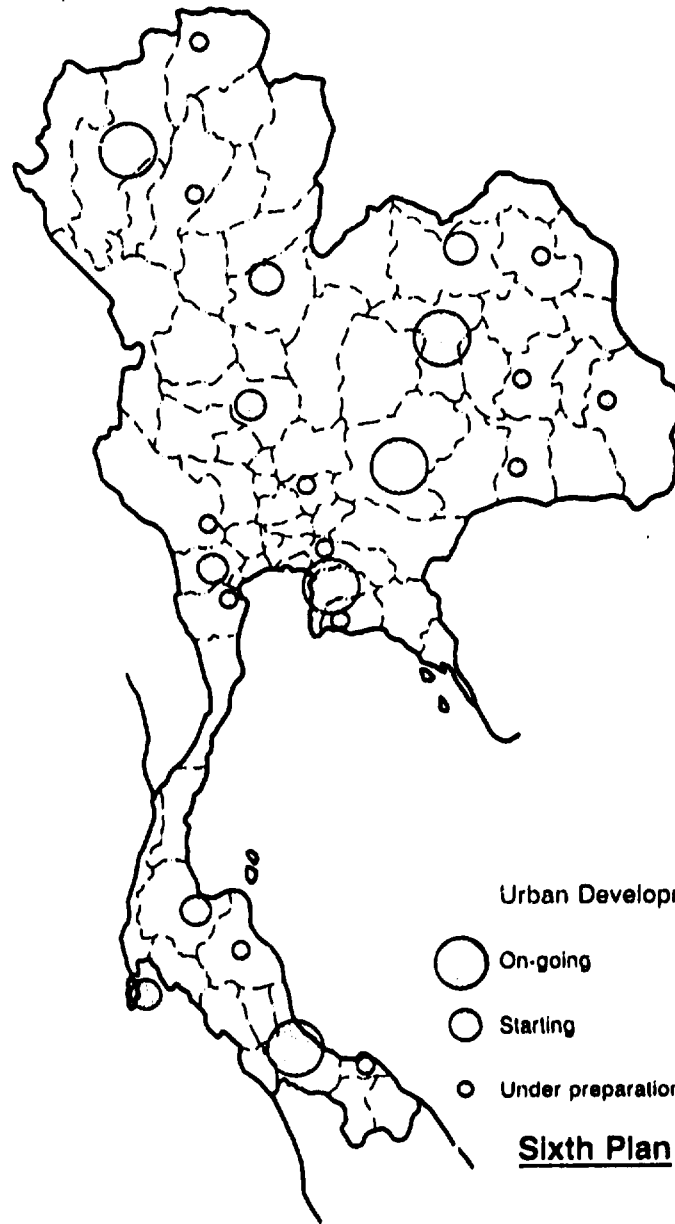
Third Plan

Third and Fourth Plan

Fig 3-1



Fifth Plan



Sixth Plan

Fig 3-2

Fifth and Sixth Plan

3.2 Industrial Development Strategies in the Seventh Plan

The current (seventh) Five-year Plan states about the direction of industrial development that "Opportunities to further expand and diversify industrial base and plentiful, both in terms of export-oriented, and in import-substituting industries, especially the petrochemical, engineering, electronics and basic industries. This is likely to be the case because of the strong likelihood that Japan and the East Asian NICs will continue to relocate their industrial base to this region, as the Western Asia-Pacific region with growing income and purchasing power as well as trade potentials becomes the new global economic center." For the regional development, "Development regional centers to serve as economic and employment bases in each region to take advantage of the decentralization policy of economic activities to the regions by speeding up basic infrastructure networks to be linked with all surrounding towns, together with designation of land use and environmental control."

In the Seventh Plan, six industrial sub-sectors have been designated as target industries including agro-industry, textile and garment industry, metalworking industry, electronics industry, petrochemical industry, and iron and steel industry.

Area development in the Seventh Plan related to industrial development includes Metropolitan region, new economic zones, and nine provinces of regional principal industrial cities. The new economic zones include the Eastern Seaboard and Upper Central Region, while the nine provinces include Chiang Mai, Phitsanulok, Nakhon Sawan, Khon Kaen, Nakhon Ratchasima, Surat Thani, Songkhla, Saraburi, and Ratchaburi.

A Study for preparation of the Seventh Plan¹ recommended for the nine provinces industrial promotion that ;

- (1) Provision of Infrastructure
 - allocating more budget to the infrastructure development of each provinces
 - government service charges for infrastructure in Bangkok and its perimeter should be charged at a rate where such services could be self-supporting, a measure for reducing reliance on government budget
 - solving the problem of electricity fluctuation and blackouts in the provinces should be considered an urgent matter
 - promoting and planning a town zoning and industrial area in the provinces
- (2) Development of Provincial Entrepreneurs and Labor
 - promoting the private sector's role in the development if entrepreneurs and labor through partial support from the government to Chambers of Commerce and the Federation of Thai Industry for their activities involving developing entrepreneurs, skills, and information dissemination
 - strengthen the provincial public-private consultative committee by providing adequate staff and budget and delineating the role and function on the committee
 - extending technological services and know-how in modern management, quality control, marketing, investment project analysis, preparation of project feasibility study for credit application, etc., in the form of training, workshops, and educational manuals. The activities should be carried out with the cooperation and institutes specialized in the areas concerned.
 - establishing a service center for subcontracting and making use of value added tax to promote subcontracting work
 - promoting the private sector to participate in the establishment of the curricula of vocational schools, and that of the Institute of Labor Skills Development, and providing training to local plant managers

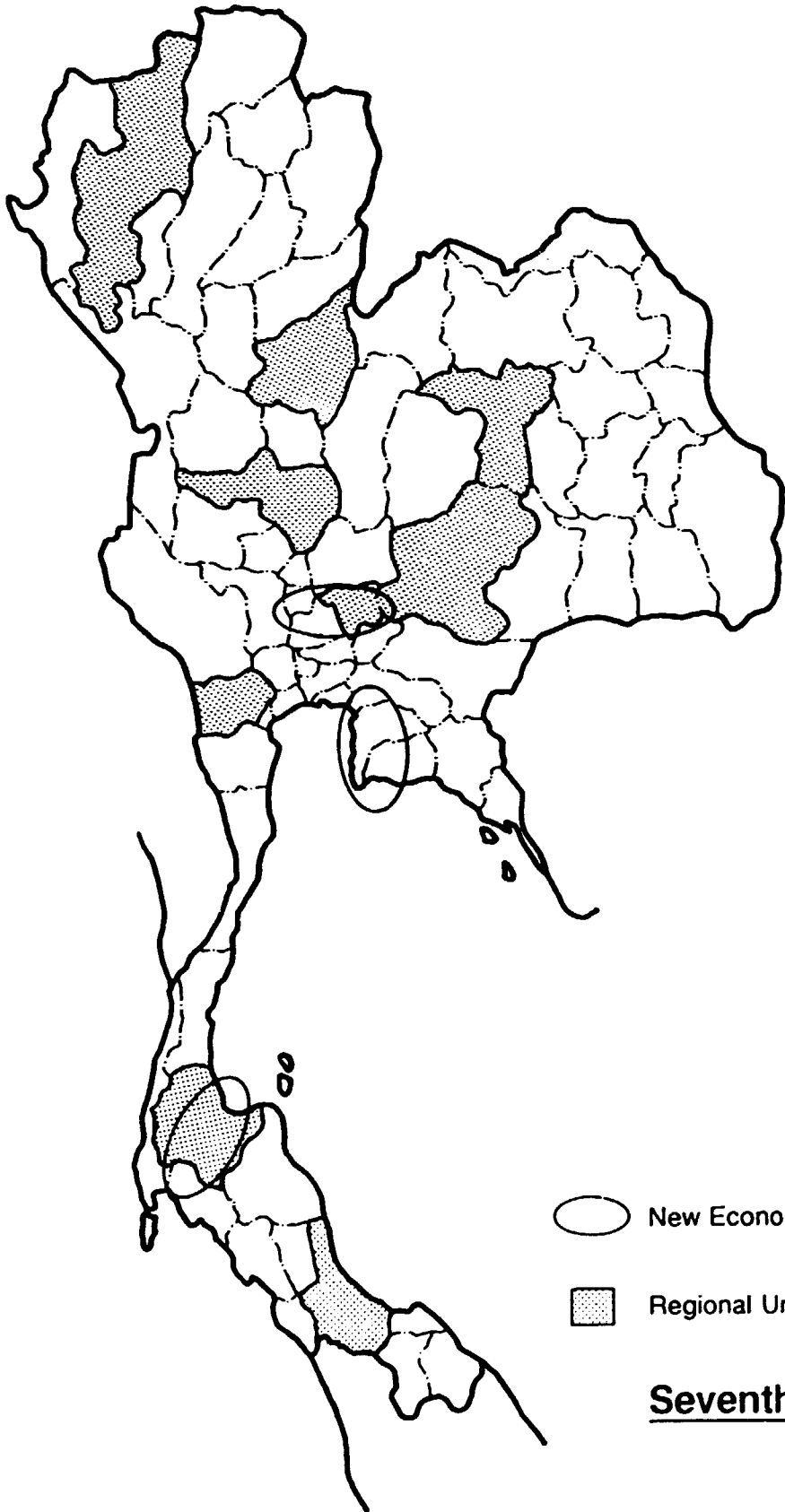
¹ Study on Development of Targeted Industrial Sectors and Dispersion of Industries to the Provinces, TDRI, 1991



- (3) Decentralization of Authority and Distribution of Services to the Provinces
- setting up appropriate service offices for each province, especially in regional industrial cities such as an office of the Board of Investment, the Thailand Management Development and Productivity Center and a customs office¹
 - delegating more power to provincial authorities to grant permission for business operations, especially by upgrading or setting up regional industrial work offices with authority to make final decision in all except cases where special control and restriction are required
 - extending the scope of promoting industrial growth to cover more area with more frequent promotional activities and greater publicity campaign of the promotional services

These recommendations are reasonable and appropriate.

The manufacturing sector is expected to be a leading sector of Thai economy, setting the growth rate 9.5 percent per annum, while the achievement of manufacturing growth was 13.7 percent in the Sixth Plan period, much higher than the target growth rate of 6.6 percent.

¹ As in the export processing zones in industrial estates, customs offices and bonded warehouses can be established in the inland areas if considered feasible. One example is the Northern Industrial Estate near Chiang Mai.



-  New Economic Zone
-  Regional Urban Center

Seventh Plan

3.3 Institutional Infrastructure for Industrial Decentralization

Thailand has a variety of institutions dealing one way or another with industrial development. As has been pointed out in previous studies, the institutional setting is configured with a multitude of agencies, often with overlapping and conflicting roles. This situation creates duplications and low effectiveness, and contributes to the difficulties of defining a coherent industrial strategy. This situation is particularly challenging, given the issues involved in nurturing supporting industries and encouraging more balanced (decentralized) industrial development across Thailand.

The following institutions are considered to be important actors for encouraging the process of regional industrial development.

Ministry of Industry (MOI)

The Ministry of Industry is the focal point for industrial development in Thailand. This is a role the ministry is still growing into, as agencies such as BOI and NESDB have exercised considerable influence in encouraging industrial development, and guiding policy. MOI is empowered to grant factory licenses and restrict construction or expansion of factories, according to the domestic situation and competition.

Department of Industrial Promotion (DIP), MOI

MOI key function, concerning the purposes of this study, is its responsibility for providing technical and management consultancy services to small and medium-sized firms through its Department of Industrial Promotion (DIP). DIP's activities involve extension and training (see detailed description in volume 1).

Office of Industrial Economics, MOI

This office serves as the information center of the MOI and formulates the Ministry's policies in line with national economic and social development plans. It also monitors plans and projects and looks for ways to develop new industrial technologies.

Department of Industrial Works (DIW), MOI

The Department of Industrial Works is responsible for industrial management, control investigation, including inspection and licensing.

Industrial Finance Corporation of Thailand (IFCT)

IFCT is a quasi-governmental development finance bank, which lends money on a long-term basis to medium and large-scale enterprises. IFCT derives its funding from a variety of sources, both public and private. Considerable funding has come from the Bank of Thailand (BOT), and IFCT follows closely Government guidelines with respect to industrial policy.

SIFCT is being launched in association with IFCT and DIP, to increase the financing available to the small firms. Formal linkages to both DIP and IFCT are still under discussion as this study has been conducted.

The National Economic and Social Development Board (NESDB)

The NESDB is primarily responsible for drawing up and monitoring the progress of five-year national economic and social development plans. These plans cover broad issues, of which industrial development and regional economic growth are key components of the Seventh National Plan. The Board reports to the Council of Economic Ministers, which is chaired by the Prime Minister. This process is designed to ensure that major development policies are considered at the highest levels of the government. Actual budgeting allocation to the various agencies is determined on the basis of priorities perceived by the Budget Bureau.

The Board of Investment (BOI)

The Board of Investment (BOI) is the principal government agency responsible for administering incentives and carrying out promotional activities to encourage private investment in priority areas. The Board is chaired by the Prime Minister and includes the top economic ministries, reflecting its power and influence in areas relating to investment promotion, and to a certain degree, industrial policy in general.

Commissioned under the Investment Promotion Law (1977), the BOI offers both tax and non-tax incentives to promoted projects. Tax incentives include corporate income tax holidays for 3-8 years, exemption or reduction of import duties on imported machinery and raw materials, and special incentives for projects in promotion zones. Non-tax incentives include guarantees against competition from new state enterprises and against state monopolization sales of products similar to those from firms being promoted.

In 1992, BOI started a new program called BUILD (BOI Unit for Industrial Linkage Development) in order to enhance investment in supporting industries.

Industrial Estate Authority of Thailand (IEAT)

Under MOI, the Industrial Estate Authority of Thailand (IEAT) was established to develop and manage industrial estates, including both export processing zones and general industrial estates. The role of IEAT is to acquire land for estates, develop this land with appropriate infrastructure and then either sell or lease portions of these estates for establishment of industrial operations. In general, IEAT has provided the hardware for physical development of a specific location. IEAT has been less involved in "software", such as extension services, or environmental monitoring.

Department of Town and Country Planning, Ministry of the Interior

The Department of Town and Country Planning of the Ministry of Interior is responsible for broad land use planning and the development of regional and municipal mapping across the country. The Department has been undertaking mapping programs for the benefit of other line agencies. A number of agencies appear critical of the work underway, given the absence of zoning or enforcement along with their land use mapping guidelines.

Department of the Treasury, Ministry of Finance

The Office has responsibility for the management of government lands. The office has clear financial incentives for the industrial development of government lands for the value-added and increase in tax revenue. The Office of Land Management has been involved in the relocation committee. Under the current relocation committee, the Office has offered land to IEAT for estate development.

Federation of Thai Industries (FTI)

FTI deals with issues which affect Thai industry and performs an advisory role aimed at complementing the Government's efforts in socio-economic development. FTI, as a major association bringing together leading members of the manufacturing sector in Thailand, has a very important role to play for the decentralization of Thai industry. Their role includes upgrading product standards and on conduct research for industrial development. FTI serves as a mediator between government and the private sector, particularly on legislative matters. As such, the FTI is considered as one of the key private sector associations to contribute to the decentralization program.

The Technological Promotion Association (Thai-Japan) (TPA)

The TPA is a non-profit private organization organized in 1973 with the aid of the Japan-Thai Economic Cooperation Society for the purpose of technological enhancement of Thai industry. Previous studies have evaluated TPA positively noting that TPA has been effective in providing support to small and medium industry through information and training.

Institute for Management Education for Thailand Foundation

The Institute for Management Education for Thailand Foundation is a Joint organization of the Thailand Foundation and the GOT (B.E. 2525 1982). Initially funded by USAID, the organization has been aimed at upgrading management skills of individual business people (training) through university-based administrative offices.

Chulabhorn Research Institute (CRI)

CRI is an autonomous institute supported by the Government of Thailand, principally the Ministry of University Affairs. The Institute includes International Center for Environmental and Industrial Toxicology (ICEIT). ICEIT's program includes, research, training, and information dissemination; programs have been supported by Germany, Japan, UNDP, ADB, UNEP. CRI is considered to be an important non-profit organization to assist in Thailand's response to growing environmental problems.

Ministry of Science, Technology and Environment

The Office of Environmental Policy and Planning, under the recently reformed Ministry of Science, Technology and Environment has responsibility for dealing with the country's existing environmental problems, as compared to the DIW, whose environmental mandate is to work with industry to prevent or minimize pollution. Other key institutions within this Ministry include the Thailand Institute of Scientific and Technological Research and the National Science and Technology Development Agency.

Environmental Research and Training Center (ERTC)

Under the auspices of the Ministry of Science, Technology and Environment, ERTC has been created with support from Japan. The primary purpose of ERTC is to conduct training and research on implementation of environmental policy, focusing on industrial pollution control. As a research unit of ONEB, ERTC may prove to be a valuable organization for the advancement of industrial pollution control programs.

Thailand Development Research Institute (TDRI)

TDRI is an internationally recognized, non-governmental organization conducting economic development research in Thailand. TDRI, originally supported by the Canadian International Development organization, has matured to be a major policy and research organization. TDRI is able to make considerable contributions to dialogue on nurturing decentralized industrial development.

Thailand Economic Community Development Association "Magic Eyes"

TECDA, better known as the "Magic Eyes" is an internationally recognized non-governmental organization involved in community development and environmental education activities. TECDA has been noted for its efforts to implement garbage clear-up campaigns in Bangkok. Their mandate could be expanded to assist in the monitoring of small and medium-sized industrial pollution, and community development activities in support of the development of the targeted urban areas.

Other Institutions

1. academic institutions outside the Bangkok area which indirectly contribute to decentralization of industry;
2. National Metal and Materials Technology Center
3. National Electronics and Computer Technology Center
4. Thailand Industrial Standards Institute
4. Rubber Research Institute of Thailand

Institutional Matrix

The following charts offer a summary of the roles that the agencies might play in providing incentives to the industrial decentralization program.

Government

AGENCY National-level Government	Financial Incentive	TA Education, Training & information dissemination	Monitoring & enforcement	Policy Advisory Services & Legis. Ass't
NESDB				•
DIP		•		
DIW		•	•	
MOI -Industrial Planning				•
MOI- Office of the Sec.		•		•
BOI	•			•
IEAT	•	•	•	•
IFCT	•	•		•
OEPP	• (?)	•	•	•

NGOs

AGENCY NGOs	Financial Incentive	TA Education, Training & information dissemination	Monitoring & enforcement	Policy Advisory Services & Legis. Ass't
CRI		•		
TPA		•		
Magic Eyes		•	•	
IMET		•		
TDRI		•		•

Private Sector

AGENCY Private Sector	Financial Incentive	TA Education, Training & information dissemination	Monitoring & enforcement	Policy Advisory Services & Legis. Ass't
FTI		•		•
ATI		•		•
Chamber of Commerce		•		•
Sector Associations		•		•

4. Future Industrial Location in Thailand

4.1 Objectives of Guiding Industrial Location and Relocation

Historically, the development of most countries has been geographically uneven -- rapid economic growth has tended to be concentrated in certain regions, leaving others relatively underdeveloped. Since these disparities have been of unacceptable degree in many countries, governments have sought for measures to counteract their causes by a variety of methods. Thailand is, of course, not an exceptional case.

One of the three main development objectives of Thai's Seventh Five-year Plan is "to redistribute income and to decentralize development to the regions and rural areas more widely". The core element of restructuring national spatial framework is redistribution and decentralization of manufacturing activities, which have been extremely concentrated in Bangkok and its surrounding provinces.

In order to relieve the imbalance between Bangkok and regional areas, there are two inter-related approaches, namely deconcentration and decentralization. Accordingly, the industrial location guidelines to define strategies for sound spatial development have been considered under the following two inter-related objectives;

- i) to reduce the highly concentrated production activities of Bangkok**
- ii) to accelerate regional industrial growth by encouraging relocation from Bangkok and promoting new industrial establishment**

At the same time, through the process of industrial relocation program or the guideline for new industrial establishment, the industries can gain the following additional benefits;

- iii) to accelerate up-grading or diversifying industrial structure as a whole**
- iv) to take effective measures for environmental protection**

The following sections in PART I deals with nation-wide industrial location, especially paying attentions to guide modern types of industry in outer regions for regionally balanced development, while the PART II of this report proposes a program for industrial relocation inside BMR.

4.2 Target of Regional Industrial Development

"National Urban Development Policy Framework" done by TDRI gives an idea about the future national industrial structure in terms of spatial distribution of number of manufacturing employment, although it is a projection, mainly following the recent trend of employment structural changes.

According to the projection, as shown in the table 4-1, the Central Region, consisting of Eastern, Upper Central and Western will become a new manufacturing center, replacing from BMA. The analysis shows desirable decentralization process, expecting the share of Greater Central, consisting of BMA, 5 provinces and Central will decline from 58% in 1990 to 49% in 2000. The Northeast and the North are expected to grow faster than the South. However, it must be noted that significant efforts both by public and private sectors will be needed to attain this target. The market mechanism can not fully work for industrial decentralization process, as have been proved by the past experiences both in Thai and abroad.

Table 4-1 Projection of Manufacturing Employment by Region

	('000)		
	1990	1995	2000
TOTAL	3798 (100)	4528 (100)	5294 (100)
growth rate		3.6%	3.2%
BMA	980 (26)	917 (20)	808 (15)
growth rate		-1.3%	-2.5%
5 Provinces	437 (12)	499 (11)	544 (10)
growth rate		2.7%	1.7%
Central	768 (20)	999 (22)	1256 (24)
growth rate		5.4%	4.7%
North	635 (17)	822 (18)	1033 (20)
growth rate		5.3%	4.7%
Northeast	555 (15)	753 (17)	993 (19)
growth rate		6.3%	5.7%
South	423 (11)	537 (12)	659 (12)
growth rate		4.9%	4.2%

source: National Urban Development Policy Framework, Vol 1, Study Area 2, Table 7.2-7.9, NESDB/UNDP/TDRI, 1991

4.3 Factors of Industrial Location

In general, industrial location decisions are made so as to maximizing profit. Size of profit depends on various factors in production, such as availability of raw materials, easy access to markets, price level of land, availability various types of workforce, service level of utilities, etc., as well as transportation network which integrates input-processing-output system.

In the case of Thailand, local resource based industries such as agro-processing, fish-processing, wood products and construction materials are scattering over nation-wide at resource available places. Most of the other industries are located in and around Bangkok, except customer oriented service industries such as machinery repairing.

For the analysis of location factors, the industries, at first, categorized into foot-loose type and foot-tight type. The foot-tight industries are resource-processing type of industries. One is local resource based industries such as agro-processing, which are already spread to nation-wide in Thailand. The other resource-processing type industry is imported heavy resource based industry such as iron and steel, and petrochemical industry, which are usually located at seaboard because of their sea port facility dependence. Another foot-tight industry is urban-type industry such as printing and publishing, and repairing services, which is not a resource-based industry but customer-oriented industry.

Foot-loose type of industries may be sub-categorized based on the factors such as degree of labor intensiveness and market accessibility. Modern industries such as machinery, electronics, and transportation equipment depend on both labor (skilled and unskilled) and good transportation. Some of this type are export-oriented industries, and they require good access to foreign market, either through sea port or by airport. The other light industries such as apparel, footwear, plastic products are more dependent on labor and less dependent on market accessibility. These industries can be located in regional area, where abundant and low-cost labor is available, yet currently concentrated in and around Bangkok.

Table 4-2 Sub-sectors by Location Factor

factors	subsector	
foot-tight	local-resource	agro-processing wood products non-metallic mineral rubber products
	non local-resource	iron and steel (port depend) petrochemical
	urban	printing and publishing repairing
foot-loose	labor/market (linkage with supporting industries)	machinery electronics transportation equipment chemical
	labor/(light)	textile/apparel leather/footwear plastic

4.4 Possibilities of Regional Industrial Development

Thai industry is now stepping up to modernized structure from the used-to-be traditional resource-based or labor-intensive industries as a whole. But the degree and speed of diffusing to regional area have been small and slow. The process is basically depend on the slow and gradual expansion from Bangkok to surrounding provinces, and not reaching to outer regions. Therefore, the areas far from Bangkok have to be set development directions so as to utilize their own locational advantages, if accelerated regional balanced development is pursued. The followings are possible industrial development in regional area in Thailand.

Chiang Mai is the area, which can accommodate high level of engineers and international business, because it has good international airport, and provides good standard of living. As it is seen recently, modern type of electronics industry based on international airport as well as traditional small to medium scale light industries are potential industries.

Phitsanulok/Nakhon Sawan, which located in-between of Bangkok and Chiang Mai, is a center of agro-based regional economies. Agro-processing will still be the major sector, but local demand based industries such as agriculture supporting and agro-processing related industries (machinery and repairing) can be further developed in the area.

Nakhon Ratchasima, relatively closer to Bangkok than other regional centers, has potential to develop industries linked with those of Bangkok with effective transportation linkage. Northeastern region has abundant workforce. Nakhon Ratchasima also has good educational and training institutions. Supporting industries and light and labor-intensive industries have development potentials.

Saraburi and Ratchaburi will be directly integrated with Bangkok. Saraburi has two types of industrial development potentials; one is linkage type and the other is resource-base type. Light processing and precision machining/electronics as linkage type industries, and agro-processing and construction materials as resource-base industries have identified as future core industries. In addition, small and cottage industries and urban support industries will play an important role in widening regional industrial structure. Ratchaburi has similar advantages as Saraburi has. Agro-processing and assemble/supporting industries will be leading industries.

The international border areas such as Songkhla/Hat Yai and Khon Kaen/Udon Thani can take advantages of integrating their activities with their neighbor countries. Songkhla/Hat Yai can be integrated with Penang Industrial Zone of Malaysia, which is already taken off as an electronics industry's center in ASEAN. Electronics related industry can be developed in this region, if special economic system such as free economic zone or export processing zone will be developed. Integrating two regions of different countries is a difficult task, however, integration of economics beyond country borders is a worldwide trend. Many crossborder integration areas are developing, such as Singapore, southern Malaysia and Batam Island of Indonesia; North America, between U.S. and Mexico; Northeast Asia between Russia, North Korea and China. Khon Kaen/Udon Thani, on the other hand, can take advantage of linkage with Laos economy. The imported materials from Laos such as logs and agriculture products can be processed in this area rather than transported directly to the national center. This area has abundant labor, so light and labor-intensive industries directed to local market as well as national market can be also promoted.

In Surat Thani, a part of future Southern Seaboard, Gas-based industry is now under development. The full scale Southern Seaboard development, requiring huge investment, has to wait until private sectors' participation.

Western Seaboard, in Prachuap Khiri Khan province, has potential to be developed as the first basic metal production center in Thailand. A private sector has already initiated to develop a steel sheet production plant. This area has a good potential to be developed as upstream to downstream integrated metal production center. In order to implement this type

4.2 Target of Regional Industrial Development

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source: National Urban Development Policy Framework, Vol I, Study Area 2, Table 7.2-7.9, NESDB/UNDP/TDRI, 1991

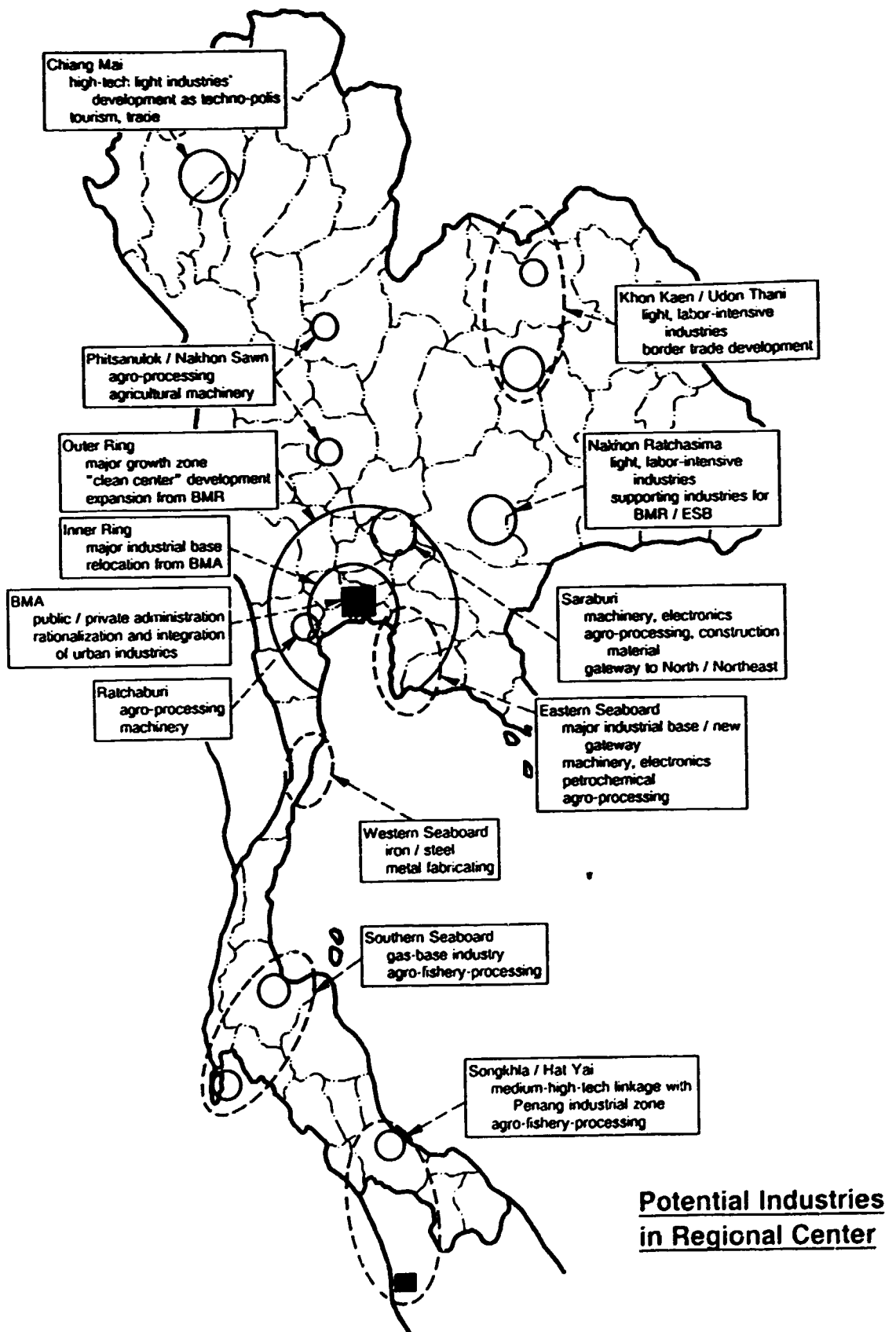


Fig 4-1 Potential Industries in Regional Center

5. Priority Programs for Regional Industrial Development

5.1 Menus to Guide Industrial Location

Current pattern of investment directly effects regional disparities in the future. At this moment, Bangkok and surrounding provinces are attracting both foreign and domestic private investment without strong rivals in Thailand.

In general, promotion of regional industries requires the formulation of an integrated strategies that consists of two major approaches, i.e., 1) policy measures to provide a large share of the country's resources to regional area, 2) provision of incentives, and technical and financial assistance to directly support regional industries. The measures include;

- (1) Resource allocation
 - infrastructure development
 transportation, communication
 electricity, water supply, etc.
 - development of industrial estate, export processing zone, factory building
 - waste water drainage, garbage and other solid waste treatment and disposal
 - transportation center, wholesale and retail markets
 - warehouses and customers facilities
 - public health services
 - educational services
- (2) Incentives
 - lower minimum wage rate
 - grant/soft loan for investment
 - grant for employment cost
 - tax exemption/deduction
 - import duty exemption/deduction
 - information dissemination
 - management and manpower training grant/subsidy

Thailand has already provided some types of incentives to industries in outer regions by BOI (more incentives than central regions), such as income-tax holidays, exemptions from import duties on raw materials, exemptions from or reduction of export duties and import bans or surcharges on competing imports. Negative externalities, such as congestion and environment problems, also have increased significantly in Bangkok. But, for those who try to find place for a new factory among nation-wide alternatives, Bangkok and around provinces are still preferable location to outer regions. That means the majority of industrial expansions in regional area are from local entrepreneurs. So, additional measures to compensate locational disadvantages in regional area are needed, if sizable impacts by new modern type of industries are expected.

Pure economic theory under ideal conditions holds that the market mechanism can guarantee the optimal utilization of economic resources in free market economy, and intervention of public sector leads to sub-optimal conditions. But a free market economy can rarely function perfectly because of externalities. Also if taking into account the importance of equality in income distribution among regions as a government policy, the objective is different from the optimal utilization of economic resources.

In this context, intensive expenditure of public resources in regional area and also market intervention with incentives by government have been observed in many countries in order to induce more industries in regional area. The next table shows the incentives granted by the governments in OECD countries in the 1970s. It should be carefully assessed the cost and benefit of any type of incentives or public resource allocation, of course. It is worth to consider the effectiveness of incentives for regional industrial promotion, rather than denying them by economic theory.

Industrial estate development is an effective measure to promote regional industry, since infrastructure and utility are, in general, not well prepared in regional area. Industrial estate also possesses the function to efficiently control the environment. Therefore, industrial estate development should be encouraged in regional areas, although the type, size and target industries may vary from one to another. With regard to developer of industrial estate, it has been recommended that the development of industrial estate should transfer to or depend on the private sector's initiative, and the Industrial Estate Authority of Thailand (IEAT)'s role should be revised to cover only regulatory functions¹. It is, however, certainly more difficult for private sector to invest in industrial estate in regional area than those in Bangkok. Thailand is already experiencing difficulties developing industrial estates far from Bangkok, such as the northeast and southern regions, and large-scale development of Bang Saphon. Public sector's involvement, as it used to be, is recommended for the purpose of accelerated development in regional areas.

¹ Policies, Instruments and Institutions for Rural Industrial Development, April 1990, TDRI

Table 5-1 Incentives in OECD countries

Exhibit 5; Forms of Aid Available for Regions Selected for Development

	Austra- lia	Austria	Bel- gium	Canada	Den- mark	Fin- land	France	Ger- many	Ire- land	Italy	Nor- way	Nether- lands	Spain	Sweden	Turkey	U.K.	U.S.
a) Investment Grants for:																	
- machinery and equipment		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	
- industrial buildings		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
b) Factory buildings	✓	✓			✓	✓	✓		✓	✓	✓			✓		✓	✓
c) Industrial land and sites	✓	✓	✓				✓	✓	✓	✓	✓		✓		✓	✓	
d) Loans:																	
- at market rate	✓					✓	✓		✓		✓				✓	✓	
- at subsidised rate	✓	✓	✓		✓		✓	✓		✓		✓	✓	✓	✓	✓	✓
- guaranteed	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
e) Fiscal concessions:																	
- on investment			✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓		
- on profits			✓			✓		✓	✓	✓	✓						
- on investment aid received from State		✓	✓				✓	✓		✓	✓					✓	
- on State charges, local taxes, licence fees, etc.	✓	✓	✓			✓	✓		✓	✓	✓		✓		✓	✓	✓
f) Grants towards labor costs		✓		✓		✓								✓		✓	
g) Grants towards employment costs, i.e., social security costs		✓				✓				✓						✓	
h) Assistance towards operating costs										✓						✓	
i) Assistance towards moving and settling-in costs of the firm	✓		✓		✓		✓			✓	✓	✓		✓		✓	
j) Aids for manpower mobility and re-location	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓		✓		✓	✓
k) State shareholding			✓			✓		✓	✓		✓	✓	✓		✓	✓	
l) Transport and other public service concessions	✓					✓		✓			✓			✓	✓		
m) Preferential treatment in the award of Government contracts	✓	✓						✓		✓	✓			✓	✓	✓	
n) Manpower training aids	✓	✓	✓		✓	✓	✓		✓		✓	✓	✓	✓		✓	✓
o) Other						✓						✓	✓	✓		✓	✓

Source: OECD, 'Report on the Role of Industrial Incentives in Regional Development', 1979.

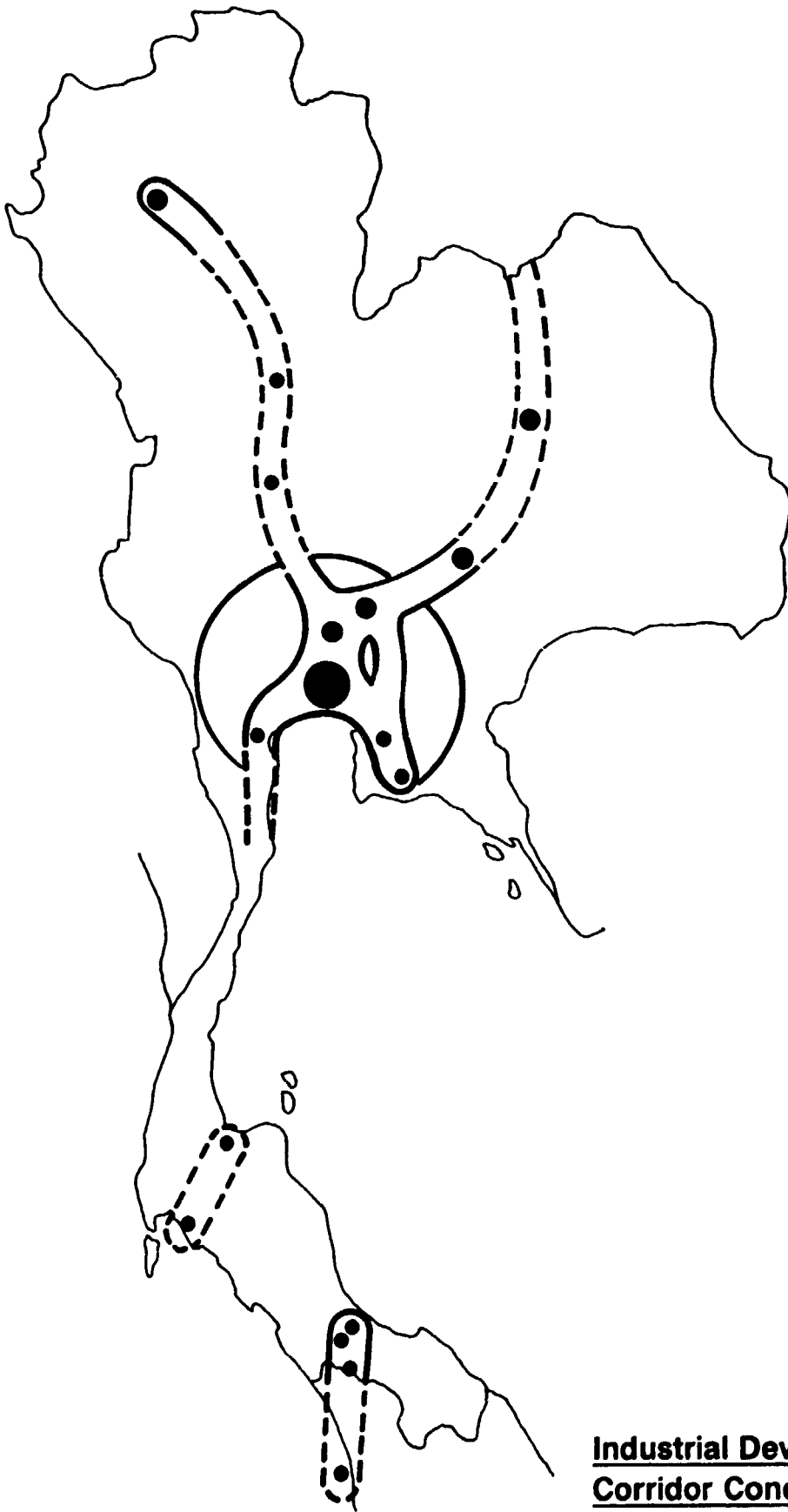
5.2 Regional Industrial Development Framework

There are three types of approaches for guiding industrial locations, they are;

- (1) deconcentration of industries from the Bangkok to neighboring provinces to reduce the congestion of Bangkok,
- (2) establishment of industries in major regional cities to distribute development opportunities to regional areas, which also helps releasing congestion in Bangkok, and
- (3) promotion of industrialization in regional areas with low level of economic development to create job opportunities, to increase income, and to reduce the disparities in levels of economic development among provinces.

These approaches can be adopted simultaneously. For the purpose of clarifying the broad direction of industrial location, the country can be divided into four broad regions from the core (BMA) to outer region. The basic frame of industrial location for the future, and the functions are as follows.

- a) **BMA**
 - develop as national and international commercial center
 - limit new industrial location
 - rationalize existing urban industries
 - relocate existing industries to outside BMA
- b) **Inner Ring (five provinces surrounding BMA; Samut Prakan, Pathum Thani, Nonthaburi, Nakhon Pathom and Samut Sakhon)**
 - develop as national production center together with the outer ring
 - receive relocating factories from BMA
- c) **Outer Ring (ten provinces surrounding the Inner Ring: Kanchanaburi, Suphan Buri, Ang Thong, Ayutthaya, Saraburi, Nakhon Nayok, Chachengsao, Chon Buri, Samut Songkram and Ratchaburi)**
 - develop as a next generation's national major industrial base
 - receive relocating factories from BMR
- d) **Outer Regions (other provinces)**
 - develop regional industrial growth centers and specialized industrial zones, based on individual comparative advantages
 - increase capacity and efficiency of traditional industries



**Industrial Development
Corridor Concept**

fig 5-1

Industrial Development Corridor Concept

The long term objectives of regional industrial development are to sustain stable growth, to distribute income equally among regions, and to utilize the national resources efficiently by appropriately protecting environment. This could be attained by locating modern industries as well as promoting local industries in nation-wide, and by formulating effective regional networks, such as transportation and communication.

On the other hand, the short-medium term development objectives may be to concentrate on only high development potential areas, because it is not possible to raise industries in all regional areas in short period. These potential areas are current or near-future national industrial cores such as BMR, the Eastern Seaboard and the Southern Seaboard, and major regional industrial centers as proposed in the Seventh Plan (nine provinces; Chiang Mai, Phitsanulok, Nakhon Sawan, Khon Kean, Nakhon Ratchasima, Saraburi, Ratchaburi, Surat Thani, and Songkhla)

The possibilities and directions of these high potential areas are as follows;

I. BMA

- to limit new manufacturing establishment
- to rationalize urban industries (integrate into specialized estates) such as:
 - jewelry, fashion, printing
 - food processing
 - distribution (wholesale and retail)
 - business park, research park
- to encourage relocation of existing industries and distribution functions, either to Inner Ring or Outer Ring, or even to outer regions if possible, depending on nature of industry

II. Inner Ring

- to establish industrial estates for relocation from BMA, especially for supporting industries
 - new industrial estate for relocation
 - expansion of existing industrial estate, if land and infrastructure capacity are available
- to develop transportation center and wholesale/retail center

III. Outer Ring

- highest growth zone, especially Bangkok-Eastern Seaboard Industrial Corridor
- to complete Eastern Seaboard development with full functions as a national major industrial base and a new gateway to abroad
- to attach "clean center" (production function with industrial waste treatment and disposal function) to existing industrial estates
- to establish new industrial estates with "clean center" along New Bypass Industrial Corridor at Chon Buri, Saraburi and Ratchaburi
- to establish a new airport-based industrial estate at Sattahip

IV. Chiang Mai

- to promote light, non-polluting, high value-added (using airport) industries as well as traditional handicraft and agro-processing
- to develop techno-polis type "New Town", integrating university, R&D center and industrial estate in order to conserve old city
- to upgrade amenity and business functions as the second modern industrial city next to Bangkok

V. Phitsanulok/Nakhon Sawan

- to promote agro-processing industries
- to promote agricultural machinery industry as well as light industries for local market
- to develop as center for transportation, trade and commerce

VI. Songkhla/Hat Yai

- to develop export processing zone or special economic zone for light, medium-high value industries mainly integrating with Penang Industrial Zone
- to promote resource-based traditional industries such as agro/fishery-processing, rubber, wood and consumer goods for domestic market as well as export market

VII. Nakhon Ratchasima

- to promote new type industries such as supporting industries (linkage with Bangkok and ESB) and apparel/jewelry cutting (labor-intensive)
- to promote traditional resource-based industries such as agro-processing, mineral and construction materials

VIII. Khon Kaen/Udon Thani

- to promote traditional resource-based industries such as agro-processing
- to strengthen trade linkages with Laos by promoting imported material-based industries such as wood products and furniture and light consumer goods manufacturing for domestic market as well as Lao market
- to promote labor-intensive light industries such as jewelry cutting and apparel

IX. Southern Seaboard

- to promote gas-based industries fed by gas from the Gulf of Thailand as well as local resource-based industries in short term
- to promote Southern Seaboard Project by Landbridge development concept in long term perspectives

X. Western Seaboard

- iron and steel based industrial complex
 - iron and steel
 - ship repair/building
 - ship dismantling/scrapping
 - down stream metal/steel
 - steel fabrication, etc.

Western Seaboard development requires coordination and cooperation in a rigorous manner between public and private sectors

6. Summary and Recommendations

6.1 Summary

Thailand is one of the fastest growing countries in the world. Manufacturing sector, led by rapid growth of manufactured exports, and fed by foreign direct investment has been the main contributor of recent economic progress. The prospects of further continued economic growth appears fine. On the other hand, income disparity among regions has been widening, the biggest disparity is one to nine between Northeast and BMR. About 60 percent of the country's manufacturing factories are in BMR, and 75 percent of manufacturing value added are produced in BMR.

There are clear and urgent needs in Thailand to guide industrial location to outside Bangkok in order to sustain stable economic development in long run. The "needs" consist of two aspects; one is pushing factor from Bangkok in order to relieve high congestion and environmental concern in Bangkok, the other is pulling factor by regional areas which are lagging behind in economic development. In the Seventh Five-year Plan (1992-1996), it is stated that "Redistribute income and decentralize development to the regions and rural areas more widely" as one of the three main development objectives.

Nine provinces have been identified to be promoted as regional industrial centers. But for the majority of private manufacturing sector, the best location is still in and around Bangkok, although negative the such as congestions and environment problems have increased significantly in recent years. So, if requirements of the factory operation in regional area are satisfied (with significant efforts of public sector), and if reasonable incentives are granted, manufacturers may move to regional areas based on their profit maximization principle.

The following institutions are considered to be important actors for encouraging the process of regional industrial development.

Ministry of Industry

Department of Industrial Promotion

Department of Industrial Economics and Planning

Department of Industrial Works

Industrial Financial Corporation of Thailand

The National Economic and Social Development Board

The Board of Investment

Industrial Estate Authority of Thailand

Ministry of Interior

Department of Town and Country Planning

Ministry of Finance

Department of Treasury

Federation of Thai Industries

The Technological Promotion Association

Institute for Management Education for Thailand Foundation

Chulabhorn Research Institute

Office of National Environmental Board

Environmental Research and Training Center

Thailand Development Research Institute

Thailand Economic Community Development Association

The objectives of regional industrial location promotion are;

- 1) to reduce the highly concentrated production activities of Bangkok,
- 2) to accelerate regional industrial growth by encouraging relocation from Bangkok and promoting new industrial establishment,
- 3) to accelerate up-grading or diversifying industrial structure as a whole, and
- 4) to take effective measures for environmental protection.

For the purpose of clarifying the broad direction of industrial location, the country can be divided into four broad regions from the core (BMA) to outer region. The basic frame of industrial location for the future, and the functions are as follows.

- a) BMA
 - develop as national and international commercial center
 - limit new industrial location
 - rationalize existing urban industries
 - relocate existing industries to outside BMA
- b) Inner Ring (five provinces surrounding BMA; Samut Prakan, Pathum Thani, Nonthaburi, Nakhon Pathom and Samut Sakhon)
 - develop as national production center together with the outer ring
 - receive relocating factories from BMA
- c) Outer Ring (ten provinces surrounding the Inner Ring; Kanchanaburi, Suphan Buri, Ang Thong, Ayutthaya, Saraburi, Nakhon Nayok, Chachengsao, Chon Buri, Samut Songkram and Ratchaburi)
 - develop as a next generation's national major industrial base
 - receive relocating factories from BMR
- d) Outer Regions (other provinces)
 - develop regional industrial growth centers and specialized industrial zones, based on individual comparative advantages
 - increase capacity and efficiency of traditional industries

While the long term goal to promote industrial activities in regional area is to utilize the country's resources efficiently by nation-wide balanced regional industrial development, the short-medium term actions have to be concentrated on regional industrial development in limited number of areas with highest development potential and priority. It is not realistic to expect rapid industrial growth in every regional area in short term.

In general, Bangkok Metropolitan Region will still be the country's industrial center, although part of its role will be taken by the Eastern Seaboard Region. The Eastern Seaboard, together with Saraburi and Nakhon Ratchasima, will become the new production center and the new national gateway to/from abroad in the foreseeable future. The possibilities of outer regions' industrial development will be limited in the short term, except some potential regional centers.

6.2 Recommendations

The importance of industrial promotion of regional areas has been repeatedly appeared for more than two decades. But expected outcome has not much been seen yet, since necessary and effective actions have not been taken yet. Negative aspects of industrial agglomeration in Bangkok have emerged.

6.2.1 General Recommendations

In order to implement any regional industrial location programs effectively, and to bring anticipated results, the following points have been considered.

a) Physical Development

Physical development is one of the key factor to bring manufacturing industries to regional area. Currently, the Department of Town and Country, Ministry of Interior is preparing land use planning for each provincial capital. Infrastructure for industry such as transportation (road, railroad, port and airport) is critical for regional industrial promotion. It is widely acknowledged that distance from Bangkok can affect the level of regional industrialization. Although the distance from Bangkok cannot be reduced, the cost of transporting raw materials and finished products could be reduced with a modern and convenient transportation network, and by reducing the road congestions. Water supply and electricity are also critical for operation in regional area.

Development of such infrastructure should be done with cooperation between central government and local government, since the former has technical know-how and financial capability, and the latter well understands local needs. Cooperation between public and private sectors might be sought for infrastructure development. However, since not high return on investment can be expected in regional infrastructure projects, private sectors participation cannot be much expected unless certain attractive incentives are granted.

b) Environment Protection

The location of polluting industries and industries producing hazardous wastes should be limited within industrial estates with appropriate facilities. Special attention should be paid to industrial location in inland areas, which may cause serious environment damage and threaten the lives on down stream area in case of accident. If these polluting industries can be induced to remain in a fixed number of locations, the overall costs of pollution abatement and the risk of environmental damage can be contained in specific geographic area.

c) Human Resource

The current shortage of engineers as well as skilled labors may result in losing the competitive edge of Thailand to Asian countries with better educated work force. Thailand can continue to attract foreign investment through increased human resource development. Thus, expansion and enhancement of both education and vocational training should be assured. Incentives should be granted to private sector which provide such opportunities to potential work force.

d) Economic Incentives

Any attempts to induce firms to locate in areas, where favorable conditions do not exist, will require additional incentives in order to offset the higher cost of locating far away from a desirable location. BOI incentives need to be adjusted so as to reach to small scale industries. Minimum wage rate adjustment should take into consideration the principle to guarantee a minimum living standard for workers, with which industries in regional area can enjoy the benefits of low labor cost. Currently the differential among regional minimum wage rates does not reflect the real price differentials.

e) Government Institution

The government authorities, including collecting tax, exempting tax, spending tax revenue, formulating economic policies, approving project applications, etc., are concentrated in Bangkok. Each region has its own unique strengths and weaknesses and the people in that particular region know about themselves very well. Also they understand their own needs and necessities. They know what their opportunities and threats are. On the other hand, it is impossible to understand all of these in offices in Bangkok but the central government does not have enough manpower to send their own staff to visit every province of the country and understand fully what the situations are. The most practical way is to utilize the manpower in the local government and branch offices of central government.

For this purpose, institutional development of local governments in regional development is essential. There are two aspects concerning this issue; budget aspect and human resource aspect. As many studies recommend, immediate actions should be taken to strengthen the local, especially provincial, governments for regional development by local initiative, since it takes so long time.

6.2.2 Action Program

Based on the above mentioned general recommendations, the following actions with good coordination will be required. One is "Institutional Development" and the other is "Physical Development".

(1) Institutional Development

Incentive Schemes and Legislated Mandates

At this writing, there are a number of actions are on-going by the key institutions involved in industrial decentralization. By mid-1992, there may be a clearer set of organizational mandates determined. These activities should be monitored in order to best evaluate suitable next actions.

- In January 1992, BOI has approved an internal reorganization that may contribute positively to their incentive program for small and medium enterprise development in the targeted growth areas. The specific incentives offered are to be finalized in June 1992, and will include new tax holidays for individual businesses based on location and positively correlated to their distance from Bangkok, decreased restrictions on content requirements, decreased duties on the import of imported (potentially environmentally cleaner) equipment;
- NESDB, Office of Industrial Planning, is currently engaged in a study to strengthen industrial planning in the regional areas, and prepare an action plan for implementing the 7th Plan. NESDB will hold a conference, in conjunction with Canada's CIDA, to bring together provincial and national level private and public sector agencies to discuss the plan for action;
- DIP has recently been reorganized, and is better preparing itself to offer information and entrepreneurial training programs through its provincial offices;
- FTI is now engaged in a program to expand its membership network and strengthen the FTI clubs in regional locations. This is a significant step to respond to the needs of local industries at the provincial level;

Each of these organizations have actions underway to respond to the objectives of the 7th Plan, and encourage industrial, decentralized growth.

Moving Forward

Based on the preceding institutional assessment, it is recommended that the relevant institutions be brought together at the local level. Each regional city can build a consortium of institutions, assembling a menu of incentives and monitoring mechanisms. This should be done individually, by each of the targeted urban centers, in order to encourage an environment conducive to industrial development.

A first step towards implementation is to convene a national-level conference, bringing together key agencies from each "corner" of the development triangle concept. NESDB has a conference planned for July 1992, to develop an action plan for implementing the 7th Plan. A second step would be to convene a similar type of conference, focused specifically on the issue of decentralization and relocation. This conference would be a prerequisite for moving forward at the local level.

Local Level Implementation

Upon gaining consensus at the national level, one avenue to pursue is the creation of an Provincial Economic Development Cooperation (Urban Development Corporation) for each of the nine growth cities.¹ These Corporations would be charged with the management of the economic and social development of the city in an order to create a local setting suitable for attracting industry from the Greater Bangkok area.

Development Corporation

The idea of the Provincial Economic Development Corporation has been discussed in Thailand over the last several years. Legislation has been adopted in 1987, known as the Specific Area Development Act. Its prime objective is to set up a corporation with jurisdiction to take action. The corporation would be multi-faceted, acting much like a private enterprise, able to mobilize and coordinate inputs from a wide variety of agencies.² Under the new Government, the concept will need to be taken up again; the development corporation idea has yet to be fully adopted for the situation in Thailand's targeted, regional cities.

Towards an Industrial Decentralization Action Plan

By bringing together the various incentives and local monitoring roles of the institutions outlined, industrialization in the regional growth centers can be nurtured. This process is directly related to the promotion of supporting industries, and speeding of the process of industrial decentralization to provinces. The following are only general approaches, not specific plans. Concerned agencies should further examine these concepts and formulate detailed action plans.

Under the management of a development corporation, urban growth centers might seek to create a long-term action plan including elements such as the:

- Establishment of industrial zones, suitable for size and type of industries in various provinces;

¹ Development Corporations have been used effectively in a number of countries to manage a process for targeted economic and social development.

² A development corporation might be in charge of city planning, issuing local regulations, and providing an array of necessary services to a community, in conjunction with NGOs and private sector business and support organizations.

- Expansion of promotion efforts at the regional and provincial level;
- Improvement and development of production technology and management techniques. Expansion of markets for small-scale industry;
- Promotion of subcontracting to regional enterprises by providing encouragement and some financial and tax incentives for such activity.
- Development of credit extension systems and financial institutions at the local level;
- Development of extension services for introduction of environmentally clean technologies;
- Development of monitoring capacity for environmental control;
- Support towards a strengthening of the small industries' own local associations or other groups (provincial or sectoral).

(2) Physical Development of Priority Regions

The resources, which the government can spend, are rather limited. On the other hand, the demand of regional infrastructure and supporting services is enormous. Thus, it is necessary to allocate the limited resources to the regions where development potential are high enough. Nine provinces have been identified in the Seventh Plan for regional economic growth centers as development potential areas. However, development potentials even among these nine provinces vary from province to province. Thus, careful assessment to determine priority and direction of development is essential.

In this study, we would like to propose the following regional development program.

- 1 Regional Urban Growth Center Development Program (RUGCDP), (7th Plan Program)
 - (sub-programs)
 - 1A Chiang Mai Techno-City Development Program (CMTCDP)
 - 1B Northeastern Border Cities Development Program (NEBCDP)
 - 1C Southern Free Economic Zone Development Program (SFEZDP)
 - 2 Urban Industry Modernization Program (UIMP)
 - 3 Clean Center Development Program (CCDP)
 - 4 Western Seaboard Development Program (WSBDP)

The first RUGCDP, original idea from the Seventh Five-Year Plan, is to develop nine regional center provinces as a core of regional industries. Among the nine provinces, this Study proposes three specialized sub-programs in Chiang Mai (CMTCDP), Khon Kaen (NEBCDP) and Songkhla (SFEZDP) in order to fully take advantages of their regional characteristics. Saraburi, Ratchaburi and Nakhon Ratchasima are to be developed as extended arms of Bangkok. Phitsanulok, Nakhon Sawan and Surat Thani are the group of second priority.

1) RUGCDP

- | | |
|-------------|--|
| title: | Regional Urban Growth Center Development Program |
| objectives: | to develop regional principal industrial cities |
| target: | (nine provinces selected in the Seventh Plan) Chiang Mai, Phitsanulok, Nakhon Sawan, Khon Kaen, Nakhon Ratchasima, Surat Thani, Songkhla, Saraburi, Ratchaburi |
| program:• | provision of infrastructure |
| • | industrial zone planning |

- industrial infrastructure development, such as transportation, communication, electricity and water supply, including industrial estate development
 - transportation and distribution center development, connecting various transportation modes
 - development of provincial entrepreneurs and labor
 - decentralization of government authority and allocation more budgets to local governments
- institution: Provincial Government, NESDB, MoIndustry, MoInterior, BOI, IEAT
- Provincial Economic Development Office in Provincial Government should be created as a coordinating body.
 - Provincial Economic Development Cooperation as a public/private joint venture should be created to implement development projects.
- remarks:• special programs for Chiang Mai (CMTCDP), Khon Kaen (NEBCDP), Surat Thani (SSBDP), and Songkhla (SFEZDP)
- NESDB is currently under preparation of these nine provinces development program, in cooperation with the provincial governments.

1A) CMTCDP

- title: Chiang Mai Techno-City Development Program
- objectives: to promote high-tech industries and strengthen research and development function
- program:• integration of research and development functions of universities, private and public research and development institutions
- development of industrial estate located within easy access of Chiang Mai Airport
 - establishment of various levels of education and training program for human resource development
 - development of high level of public services such as transportation and communication, health care, education and urban amenities

1B) NEBCDP

- title: Northeastern Border City Development Program
- objectives: to strengthen economic relations with Laos to develop imported raw material processing industry such as wood-processing and agro-processing
- program:• establishment of specialized industrial estates
- improvement of infrastructure, especially transportation
 - extension technological services and know-how on modern management, quality control, marketing, investment analysis, etc.

1C) SFEZDP

- title: Southern Free Economic Zone Development Program
- objectives: to promote modern light, medium-high value-added industries by mainly integrating with Penang Industrial Zone
- program:• development free economic zone or export processing zone on and around border area
- establishment of various levels of education and training program for human resource development
 - development of high level of public services such as transportation and communication, health care, education and urban amenities

The second and the third programs are related to the industries in and around Bangkok. The UIMP has two components; one is a program for relocation of factories in congested area of BMA to in and around BMA, and the other is rationalization of urban industries inside BMA by integration of same type of industry (see detail program in Part II).

2) UIMP

- title: Urban Industry Modernization Program
- objectives: 1) up-grading urban industry
2) finding places for expansion
3) reducing congestion
4) reducing industrial pollution in urban areas
5) creating jobs in outside areas of BMA
6) rationalizing the land use and function of BMA
- program: UIMP has two components;
1) re-location of existing industries in BMA to outside BMA; and
2) rationalization of urban industries in BMA by integration of same type of industry.
- remarks: for more details of the UIMP, see the Part II of this Report (Industrial Re-location Program of Bangkok).

CCDP is a combined program for promotion of industry and protection of environment. Industrial waste treatment facility and the place for solid waste final disposal are urgently needed for industries in Bangkok. But currently it is very difficult to find places for such facility which people do not like have nearby. The idea of CCDP is to give incentives to local community by providing another positive functions such as production, recreation, relaxation, etc. The possible locations of CCDP are Chonburi, Saraburi, Ratchaburi, etc.

3) CCDP

title: Clean Center Development Program
objectives: to develop industrial waste treatment and disposal facilities in Outer Ring Area (e.g. Chonburi, Saraburi, Ratchaburi) in acceptable form by local community
program: development of industrial estate stile "clean center" with the functions of production/research and development and industrial waste treatment and disposal facilities

WSBDP is designated for iron and steel, and metal fabricating industries. The industrial structure of Thailand has reasonable size of basic metal demand, and Western Seaboard is appropriate for the location.

There are some other important industrial development programs, such as Eastern Seaboard Development Program, Southern Seaboard Development Program which have already planned or been under implementation. These should be proceeded as they are scheduled.

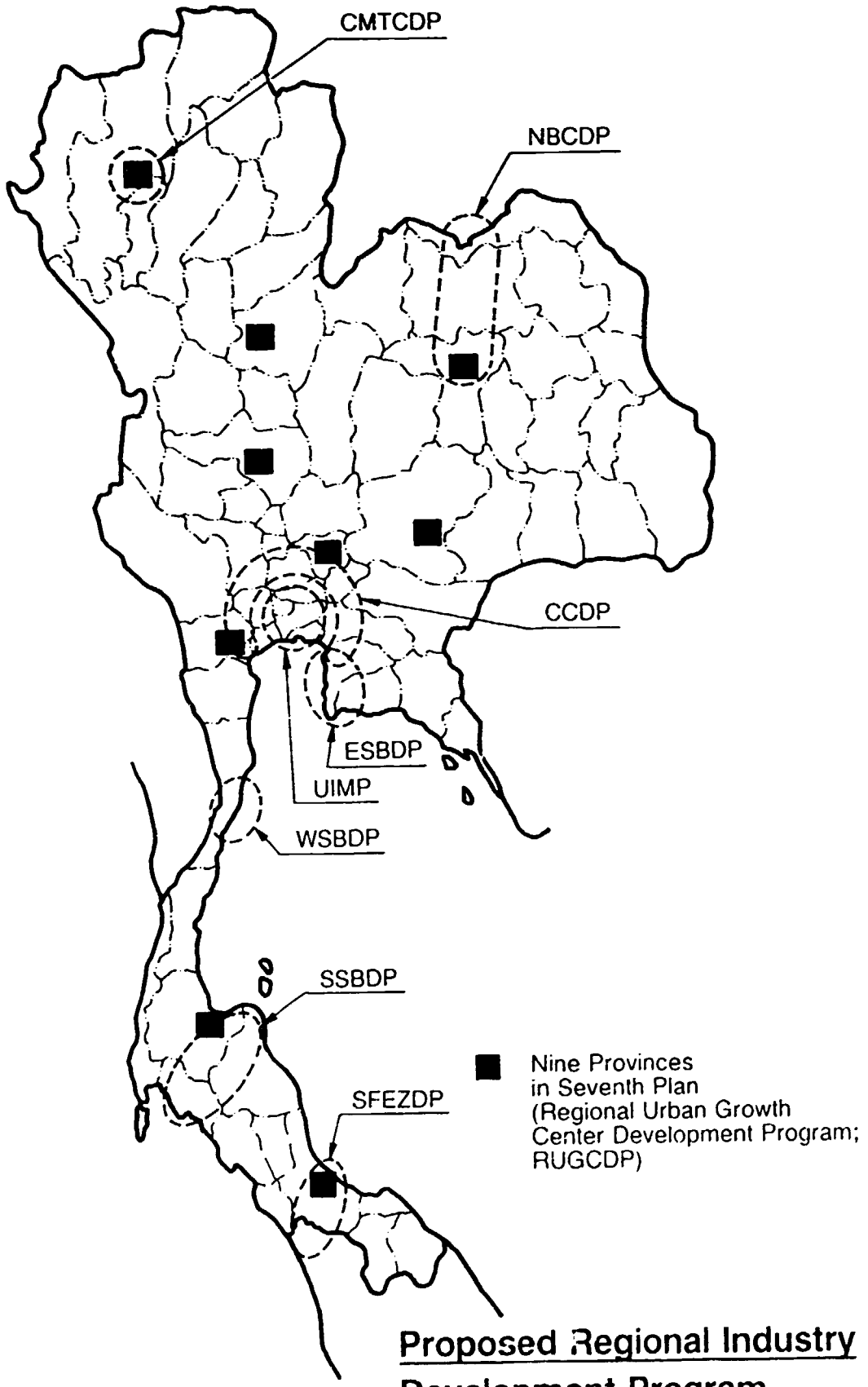


Fig 5-2

Proposed Regional Industrial Dev. Program

Finally, we would like to emphasize two aspects, which are critical factors for success in regional industrial development; 1) Government Commitment, and 2) Local Government's Initiatives

1) Government Commitment

Private sector's location decision is basically made with profit-maximization principle, which sometimes conflicts with the government long term development objectives. In this context, definite public sector initiative is necessary to encourage private sectors to relocate or locate their factories to regional area by providing infrastructure, services, promotional privileges, training, etc., even it might be costly for public sector in short term. **The government, therefore, should provide foundations, both physical development as well as granting incentives,** to the extent that private sector recognize the attractiveness of locating their factories in regional areas.

2) Local Government's Initiatives

The concentration of government administrative authorities in Bangkok has been definitely weakened local government development initiatives and also discouraged private sector's location decisions to regional area.

It is, therefore, recommended **to decentralize administrative authorities to local government as well as responsibilities of their development tasks.** However, since the capability of local governments is not enough to carry out the whole development process, it is necessary to provide assistance, both technical and financial, by the central government for a certain period. In addition, not only the administrative authorities but also the financial capacity, larger central government budget allocation as well as the permission to raise local government revenue should be granted to local governments, as they were recommended in many studies such as TDRI's National Urban Development Policy Framework.

Volume II
Part II Industrial Re-location Program in Bangkok

1. Industry of BMA: Trend & Present Condition

1.1. Trend

In order to analyze the location of industries in and around Bangkok, we divide the whole country into the following zones:

Zone 1(BMA): Bangkok Metropolis (Bangkok and Thonburi).

Zone 2 (Inner Ring): the five provinces surrounding Bangkok (Samut Prakan, Pathum Thani, Nonthaburi, Nakhon Pathom and Samut Sakhon).

Zone 3 (Outer Ring): the ten provinces surrounding the Inner Ring (Kanchanaburi, Suphan Buri, Ang thong, Ayutthaya, Saraburi, Nakhon Nayok, Chachengsao, Chon Buri, Samut Songkram and Ratchaburi).

Zone 4 (Others): other provinces.

- Other Central: other provinces in the Central Region.
- Northern: Northern Region
- Northeastern: Northeastern Region
- Southern: Southern Region

Thailand's population is heavily concentrated in one city-- Bangkok has 69% of the nationwide urban population, the highest among countries with populations greater than 15 million people-- Nairobi is the second at 57%.

BMA's share of Thai GDP was 39.7% in 1987, and including the Inner Ring brings that figure up to 49%. Manufacturing in the Inner Ring is growing faster than BMA, a trend which appears to have accelerated after 1987 with the the heavy concentration of new industrial estates.

Exhibit 1: Regional Distribution of Manufacturing Value-added

	1982	1987	(%) Change
BMA	57.58	58.78	1.20
Inner Ring	15.99	18.82	2.83
Others	26.43	22.40	-4.03
Whole Kingdom	100	100	

Source: NESDB.

The overconcentration of industry in the Bangkok area can also be seen by the number of firms located there, excluding rice mills. In 1987, 48.8% of the firms were located in BMA, followed by the Inner Ring with 11%, the Northeastern Region with 10.1% and the Outer Ring with 9.1%.

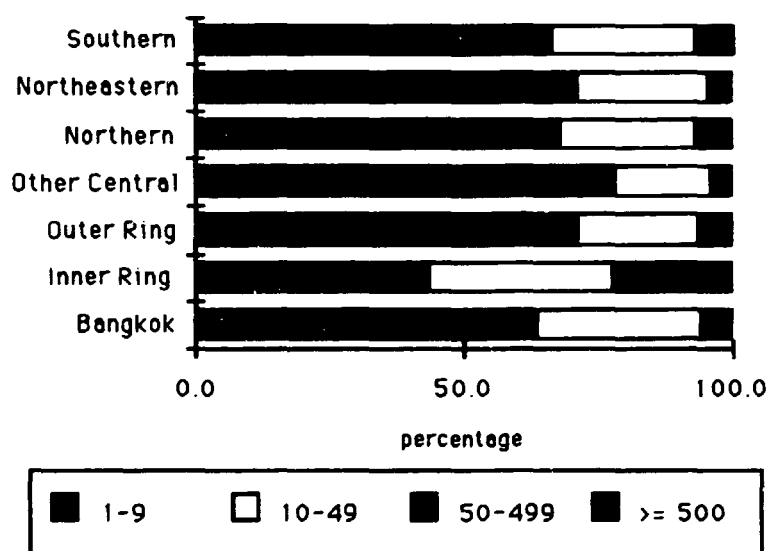
From 1981 to 1987, new company registrations and transfers were highest in the Inner Ring, up 10.7%, compared to 8.4% in Bangkok and 8.6% in the Outer Ring. This confirms a trend during the last decade in which firms have gradually moved from BMA to the Inner Ring.

1.2. Present conditions

The huge numbers of firms in BMA indicates a huge number of small- and medium-sized enterprises, while the Inner Ring is characterized by a higher proportion of larger companies. Therefore, relocation guidelines specifically applicable to smaller firms will be essential in order to promote an overall successful policy.

Exhibit 2: Distribution of Firms by Region and Size
1987 (%)

Employment Size	Micro (1-9)	Small (10-49)	Medium (50-499)	Large (>= 500)	Total
Bangkok	63.8	30.8	5.0	0.4	100
Inner Ring	43.3	34.8	19.7	2.2	100
Outer Ring	71.3	22.9	5.2	0.6	100
Other Central	78.0	18.5	3.2	0.3	100
Northern	67.9	25.7	6.2	0.2	100
Northeastern	71.0	25.0	3.7	0.3	100
Southern	66.5	27.0	6.4	0.1	100
Whole Kingdom	64.3	28.6	6.6	0.5	100



Source: Ministry of Industry.

In terms of sub-sector shares of manufacturing in BMA, fabricated products stand out by far as the largest of all. Other sub-sectors which follow are machinery & parts, rubber & plastic products, wearing apparel, printing & publishing, transport equipment, and food. In the Inner Ring, food, fabricated products, machinery & parts, and textile form the largest group, followed by transport equipment.

Exhibit 3: Share of Sub-sectors in Manufacturing

TSIC	Sub-sector	Bangkok	Inner Ring
311, 312	Food	5.4%	11.3%
313	Beverage	0.5%	0.4%
314	Tobacco	0.0%	0.0%
321	Textile	4.1%	9.6%
322	Apparel	6.8%	1.4%
323, 324	Leather & footwear	1.8%	4.0%
331	Wood & cork	4.8%	9.7%
332	Furniture & fixtures	3.1%	2.3%
341	Paper & paper products	1.5%	1.3%
342	Printing, publishing	6.8%	1.1%
355, 356	Rubber, plastic products	7.9%	5.9%
351, 352	Chemical products	2.9%	5.4%
353, 354	Petroleum products	0.1%	0.2%
361, 2, 9	Non-metallic	1.2%	4.2%
371, 372	Basic metal	1.4%	3.8%
381	Fabricated products	23.1%	11.2%
382	Machinery & parts	9.4%	10.3%
383	Electrical machinery	3.3%	2.7%
384	Transport equipment	5.6%	6.6%
385 - 91	Other	10.2%	8.6%
Total		100.0%	100.0%

Source: Ministry of Industry.

2. Key Problems and Solutions for BMA

2.1. Key problems of BMA

Overconcentration in Bangkok is causing problems of congestion, skewed income distribution, continuous urban migration, and environmental degradation in Bangkok and the whole Kingdom.

(1) congestion

Bangkok is suffering from severe congestion problems, which entail huge opportunity costs for all residents. Alleviating traffic congestion would contribute to improved quality of life, which is one of the key targets in the 7th Five Year Plan.

Relocation of industry away from Bangkok would relieve the stress on roads from distribution of raw materials, semi- and finished goods, as well as workers.

(2) skewed income distribution

Although Thailand as a whole has enjoyed impressive economic development during the last three to five years, income distribution has worsened. The top and bottom quintile's share of income were 55.0% and 4.5%, respectively in 1988-89, compared to 51.5% and 5.4%, respectively, in 1980-81.

The income gap between Bangkok and rural areas has worsened as a result of rapid growth centering around the capital. Average income in Bangkok rose from 4.9 times the rest of the country in 1980 to 5.7 times by 1988. Encouraging a relocation of industry can help to narrow this spread by creating non-farm employment opportunities for the rural population.

(3) continuous urban migration

Industrialization in Bangkok has provided a great number of job opportunities, thus attracting a sustained inward migration to the capital area, exacerbating existing unemployment and underemployment problems in BMA.

(4) environmental degradation

Bangkok is facing serious environmental degradation. For instance, the level of dissolved oxygen in the Chaopraya River is nearing zero, from the mouth to 60 km upriver. Under these conditions, no fish can survive. A TDRI study shows that 70 to 75% of water pollution of Chaopraya River comes from houses, restaurants, and hotels. But the effects of industrial pollution pose even greater threats to humans because of chemicals and heavy metals. In Bangkok, residential areas and factories are located side-by-side, increasing the risk of an industrial accident fouling the water supply.

Moving polluting industries from Bangkok to other areas will not completely solve environmental problems, but merely reduce pollution in heavily populated areas and reduce risks.

Relocation can also provide a good opportunity for installing pollution control devices in the new factories. The high cost of land and lack of space in BMA are major deterrents to the introduction of pollution control technology, so a shift to outlying areas will make it easier for factory owners to follow environmental regulations.

Relocation to industrial estates also create opportunities for shared treatment facilities, thus lowering costs to individual factories. Government grants or financial assistance could help to ensure that such measures are taken.

2.2. Causes of overconcentration in Bangkok

Historically, Bangkok has been Thailand's sole major center of economic, political and social activity. The following have been identified as reasons for the primacy of Bangkok:

- (1) center of government and residence of the monarch.
- (2) government is centralized.
- (3) a major port.
- (4) center of cultural and educational facilities.
- (5) center of inter-regional traffic.
- (6) no strong regionally-based ethnic or religious rivalries.
- (7) secondary cities are underdeveloped

Because of the primacy of Bangkok, firms located there have the following advantages:

- (1) Transportation costs are lower. The prime port and the airport are located nearby and the road network of the nation has been made so the inter-regional road network outside of Bangkok is not well developed. Locating in Bangkok allows firms to have greater profits and/or lower prices for their products, increasing competitiveness.
- (2) Infrastructural arrangements, such as utilities, are better than other regions. Based on the availability of the infrastructure, costs are lower.
- (3) Labor productivity may be higher in Bangkok because the population is generally better educated and has experience in the modern economic sector, such as factories.
- (4) The cost of credit may be cheaper because of the better availability of financial institutions.
- (5) Transaction costs for dealing with the government are generally lower since government decision-making authority is concentrated in Bangkok.
- (6) Economies of agglomeration are strong. Companies can take advantage of linkages with other firms located nearby. The biggest market in Thailand with the largest population and the most economic activity exists in Bangkok. These positive externalities reduce costs for all firms located there.

Nearly all the functions except agricultural activities are centered in Bangkok and this is causing overconcentration problems. The key to solving these problems is moving functions to outlying areas.

In overcoming the above situation, industrial activity is a very good candidate for relocation. The relocation of industry is especially effective for reduction of population, transportation demand, and pollution.

3. On-going Industrial Re-location Program for BMA

3.1. Establishment of Relocation Committee

In June, 1991, a committee was set up by the Thai Government to take actions for the relocation of some industries from Bangkok to the suburbs. The objectives of the project are as follows:

- (1) To implement government anti-pollution policy
- (2) To reduce over-population problems in Bangkok.
- (3) To create a balanced labor market
- (4) To comply with government policy on environmental issues by providing an estate for small and medium scale industries, not only to control impact on the environment but also to help reduce the cost of environmental protection.

An adhoc committee appointed by the National Environmental Board (NEB) established the following guidelines for carrying out the task:

- (1) An industrial estate is to be set up on government land
- (2) It is to be a pilot project with public utilities, standardized air pollution controls and waste water treatment systems, surrounded by green area.
- (3) The project is to serve as a new base for Bangkok factories with pollution problems, supported by measures set up by Department of Industrial Works (DIW).
- (4) The Industrial Estate Authority of Thailand (IEAT) is to be granted a subsidy no less than 90% of total investment costs of the project; and the Treasury Department is to lease the land to IEAT on a long-term, favorable basis.
- (5) Environmental measures are to be set by the Office of the National Environmental Board (ONEB).

Out of the ten sub-sectors that DIW considers as polluting, four were selected for this project:

- (1) Metal-working - foundries.
- (2) Metal products - electroplating, painting shops.
- (3) Animal and animal feed - slaughter houses, tanneries.
- (4) Textile - dyeing, printing shops.

3.2. Selection of sites

Nine sites in BMA and Pathum Tani Province were selected by the Treasury Department as candidates for the development of industrial estates. All sites are owned by the Thai Government.

Out of the 9 sites, 3 were selected for further consideration. The criteria for selecting the three is unknown. In the report submitted to the committee, the characteristics of the three sites were studied in further detail. The following aspects were considered in selecting one for the initial investment:

- (1) Physical aspects: proximity to the city.
- (2) Financial returns.
- (3) Time period required for infrastructure development.
- (4) Social aspects: educational establishments for future sources of labor.
- (5) Government services: readily available hospitals and health centers.
- (6) Residence; proximity to low-income housing estates.
- (7) Labor supply: proximity to existing communities.
- (8) Present use of land.
- (9) Density.
- (10) Investment costs.

For each of the three sites, two alternatives were considered--with and without the provision of factory buildings.

The project is important to demonstrate a method of locating factories in industrial estates to help companies by sharing common costs and ensuring that government standards on pollution control will be met. The estate will be geared specifically to small- and medium-sized enterprises.

The proposed estate is relatively small in size and is located within the boundary of BMA. Some alternative sites need to be studied so congestion and environmental can be considered.

3.3. Development scenarios of the plan

In the Committee's plan, the Government pays the initial investment costs and the private sector covers operating costs. A similar arrangement has been seen with the Bankhunting Hazardous Waste Treatment Facility. It falls well in the line of private sector initiatives taken by the Thai government in the past several years.

While the Committee Plan is useful in considering the physical development of the specialized industrial estates, a broader view should be taken in order to achieve effective industrial relocation. Given that companies make location decisions for a variety of reasons, the construction of an industrial estate alone will not be a sufficient lure without the provision of financial incentives.

3.4. Cost/benefit analysis of the plan

3.4.1. Financial feasibility

The financial feasibility of the project is low for all cases under consideration in the report. However, the construction of this industrial estate serves broader policy interests, so financial considerations must be balanced against the positive effects of reducing congestion and pollution.

Construction of the model industrial estate will be a net burden on IEAT, which as an independent entity, must sustain itself. Therefore, it is essential that the government allocate subsidies for projects such as this

which meet key government objectives. The benefits from this project accrue to all of society, so only the government is in a position to pay for them.

3.4.2. Economic/social feasibility

More important is the social/economic feasibility which concerns costs and benefits for the economy or the society as a whole.

The calculation should be conducted as follows:

- (1) Direct transfer payments such as taxes, subsidies, and credit transactions should be omitted.
- (2) Goods imported and exported as a result of the project should be included (i.e. imported pollution control devices)
- (3) Opportunity costs for land should be included.
- (4) Net impact on employment should be counted, including construction of the project.
- (5) For domestically produced goods, the traded portion should be calculated.
- (6) The outputs of the project are economic benefits for the Thai economy, reduced cost of externalities such as pollution and congestion. The Thai economy as a whole benefits when industrial pollution is reduced and, as a result, clean-up and medical expenses, and people's lives can be saved. The same is true for congestion problems.

As can be seen above, cost/benefit analysis is extremely difficult. However, economic and social costs derived from overcrowding and congestion are also heavy, strictly from the basis of time lost in traffic jams.

$$\text{Economic losses} = [\text{Number of persons}] \times [\text{Time spent in congestion}] \times [\text{Wage/salary}]$$

3.5. Environmental effects of the plan

Since the proposed industrial estate has central treatment facilities, this reduces the environmental impact from the wastes.

The proposed site for development of the estate is currently used for agriculture. It is in so-called green area where some restrictions are imposed by the Ministry of Interior as to how much land can be developed for industrial purposes. Some consideration must be made as to offset the effects of the estate.

3.6. Micro level analysis

Before we go into further analysis of the present plan, we would like to briefly look at the structure of private sector businesses that are thought to be targets.

When we try to influence the decision-making process of private firms, it is necessary to understand which factors have influence on them.

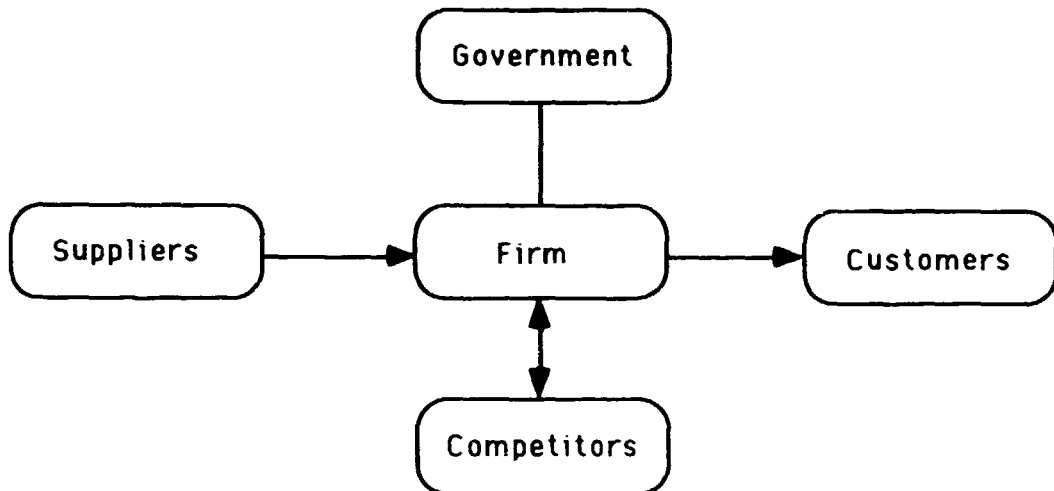
Under a simple economic assumption of a firm being a profit-maximizer, the following factors greatly influence the decision of their location:

- (1) The price of the product at the factory and the quantity demanded.
- (2) Labor costs, including technical, managerial, both skilled and unskilled.
- (3) Transportation costs. In the context of Bangkok, the opportunity cost of congestion can be large.
- (4) Land cost, including tax, if any.
- (5) The cost of raw materials, including inventory costs.
- (6) The cost of utilities, such as electricity and water.
- (7) The cost of credit.
- (8) Transaction costs for arranging licenses, permits, approvals, promotions, etc. which are necessary for doing business or increasing profitability.
- (9) Also important for some industries is the cost of pollution control, including both initial and maintenance costs.

The order of importance of the above factors depends on the individual firm. It also shifts over time as internal and external factors change.

The following is a chart that describes the relationship of a firm with other entities. The firm buys raw materials from suppliers. It manufactures products and sell them to their customers. It has competitors producing competing products, and is regulated by the government.

Exhibit 4: A Model of the Competitive Environment of a Firm



For some firms locations may be advantageous because of proximity to suppliers. For others it may be important to locate near major customers. For small- and medium-sized supporting industries, it may be essential to closely coordinate products and exchange information with customers. In Bangkok, where congestion is serious, the transportation costs of raw material, products, and information, including the opportunity cost of time lost on the road, can be a large factor in determining the location of factories.

3.7. Weakness of proposed relocation program

(1) Present plan takes a negative approach.

The present committee plan takes a negative approach in only targeting 'polluting industries'. The industrial estate built under this plan will have a negative image because factories locating there are supposedly causing damage to society. The estate will be like a prison where these 'problematic' industries will be relegated.

Under such a scheme, only a few factories will be willing to move to the estate. When they are forced to relocate, they will suffer from additional costs. This could lead to bankruptcy for some firms already in financial difficulties.

(2) Area and quantitative targets are not clear.

Under the present plan, only a small portion of 'polluting industries' are targeted for relocation. The plan limits itself and does not have a long-term plan for dealing with overconcentration problems. Clearer long-term targets for industries needing relocation, existing areas requiring deconcentration and new areas for relocation all require planning.

(3) Objectives are too limited.

The present objectives are to reduce environmental pollution and congestion. They are not enough for solving the overconcentration issue. As all the symptoms of overconcentration are inter-related, a more integrated approach should be taken.

We should also make sure that reasonable industrial development will be possible under the relocation plan. The relocation should be considered in the context of promoting industrial sector. Under the present circumstances, those who will suffer are small and medium industries which form the backbone of local Thai industries. They are essential to the dynamic development of the future Thai industrial sector. Since some damage is inevitable, it should be kept to a minimum, or compensated.

Rather than simply solving existing problems, relocation can be used as an opportunity for firms to expand and upgrade production capabilities through the introduction of advanced technology, and through reducing certain overhead costs such as pollution control. Some firms may be able to set up joint purchase schemes as practiced in some other countries. In short, relocation should be treated as a good opportunity for the promotion of small- and medium-sized firms. Whether it will be made possible depends on the government. Small- and medium-sized cannot alone take advantage of relocation, as they are short of financial resources, manpower, and technology. It is the role of the public sector to assist them. Promotion of small and medium firms should be made the central objective of the whole program.

(4) Insufficient incentives.

Since this program should not have a side effect of reducing competitiveness of Thai industry, financial incentives will be necessary to offset the costs of relocation.

In dealing with pollution, either the polluter or pollutee can bear the cost of reduction. Also possible is the mixture of the two approaches.

Under the polluter-pays-principle as stated in the 7th Economic and Social Development Plan, firms will have to pay treatment costs, i.e. maintenance costs of treatment facilities. In the case of Bankhuentien Treatment Plant set up by DIW, this principle was followed. In this case, the investment cost of the Plant was paid by the government. The same approach is taken in the case of the proposed industrial estate in which the development of the estate is undertaken by the government.

For the success of the project, other important costs should not be overlooked. Under the present scheme, firms are to bear most of these costs. It would be better in the light of the promotion of the small and medium industries if the society as a whole, i.e. government, bear part of the cost so that the transition can be made easier for small and medium firms which lack strong financial capacities.

(5) Institutional arrangements are too loose.

There seems to be no strong coordinating body under the present plan. A workable program covers broader activities besides the construction of industrial estates. In order to achieve the objectives effectively, strong leadership is necessary to promote the plan. Since the workable program involves the promotion of industries and a broad spectrum of issues, some specific agency should be given mandate to cover wider issues. Also the roles of each ministry and agency should be more clearly defined. Otherwise, this type of plan will not be realized.

4. Urgent Need of Program

(1) Political and citizen's consensus already exists.

Our team interviewed a great number of government officials of all kinds. They seem to agree on the needs for some kind of comprehensive program dealing with the overconcentration issue. Also frequent media coverage shows that citizens are aware of the problems and feel the needs for solutions.

(2) Survey results clearly show need for relocation

Based on a survey that has been conducted for this study, the following points are relevant to the current industrial relocation plan:

- 1) 40.4% of the firms are actively considering moving; 35.4% are open to the possibility.
- 2) 57.5% of the firms planning to move wish to do so within 5 years.
- 3) 52.2% of the firms say expansion is constrained by high land prices, thus necessitating a move; congestion is the second most important factor behind a desire to move.

These results clearly show the need for relocation. In the survey, not only 'polluting industries' but also ordinary firms locating BMA were included. So, the needs are not entirely generated by the pollution control factor.

5. Experiences of Other Countries

5.1. Japan's experience

5.1.1. Problems and solutions

Since the late 1950s, Japan has achieved rapid industrial development. During the same period, a rapid concentration of industrial activities in the three metropolitan areas of Tokyo, Osaka, and Nagoya occurred. Historically, these areas have been political, governmental, cultural, and commercial centers. They have had large populations and have been industrial centers, which meant big markets for both consumer and industrial goods. They have been transportation centers with road/railroad networks and large ports. For private enterprises, these areas provided positive externalities based on the economies of agglomeration.

This trend continued in the late 1960s and the problems of rapid land price increases, traffic congestion, and environmental pollution became prominent. Living conditions of these urban areas deteriorated at a high speed. In order to solve these problems, more balanced inter-regional industrial development and industrial relocation became urgent issues for the Japanese government.

The goal of Japanese industrial location policy is to achieve industrial development in harmony with the local environment. In order to achieve this goal, the following three types of measures have been taken:

- (1) To prevent overconcentration of industrial activities in urban areas, location of factories in overconcentrated areas was discouraged and relocation to outer areas promoted. Proper location of industries in less developed areas or economically depressed areas of the country was promoted.
- (2) Infrastructure necessary for industrial development such as industrial land and water was secured.
- (3) When factories were built, sound environment was maintained by securing green areas, setting up pollution control facilities, and establishing safety measures.

As industrial location is related to many other issues such as regional development, infrastructure, environment, and natural hazards, the laws and regulations concerning industrial location in Japan are extensive and complicated. They can be categorized as following: 1) regional development, 2) location guidelines; 3) land use regulations, and 4) factory environment and infrastructural development.

The second measures are especially relevant for the purpose of this report and require further explanation.

The Industrial Relocation Promotion Act (1972) specifies the three metropolitan areas (Tokyo, Osaka, Nagoya) where industries are to be moved out and some other regional areas where industrial location should be promoted. It promotes relocation of industries from the former to the latter areas and also encourages new establishment and expansion of existing factories in the latter, thus solving the two issues of overconcentration and underdevelopment simultaneously.

Under this Act, the Ministry of International Trade and Industry had a mandate to draw up the relocation plan. Accelerated depreciation, tax exemption, development of industrial land, and other budgetary and financial measures are stipulated in the Act. In order to carry out the physical development of industrial estates and provision of special loans for industrial relocation, the Regional Development Promotion Corporation was established in 1962.

Under the New Industrial City Development Promotion Act (1962), the Prime Minister designates a number of areas that have high potential to become industrial growth centers and provides privileges for infrastructural development, tax incentives, etc. Other laws include the Industrial Development Area Promotion Act (1964), the Less Developed Area Development Promotion Act (1961), and the Regional Industry Promotion Act (1971).

5.1.2. 'carrots' and 'sticks' (plus industrial estates)

The industrial location policies are pursued by the government through promotional measures ('carrots') and control measures ('sticks'). Physical development of the sites, i.e. industrial estates, is an essential part of the policy. It is included in 'carrots'. The emphasis of the Japanese government in using these tools is more on the promotional side. The government does not take coercive control measures but tries to guide private enterprises with incentives so as to achieve the policy objective.

The following are incentive measures for relocation of factories in Japan:

(1) Taxes

- Special exemption of land sales tax when purchasing land in the specified areas.
- Reduction of land holding tax in specified areas.
- Reduction of local business tax in specified areas.
- Accelerated depreciation for industrial machines acquired by firms in less developed areas.
- Accelerated depreciation for machines purchased by small and medium scale industries.
- Accelerated depreciation for pollution control facilities.
- Special tax treatment for energy saving investment.

(2) Subsidies

- Special subsidies for the promotion of industrial relocation. Provided to local governments and private firms for environmental protection facilities, employee welfare facilities, and safety facilities.
- Subsidies to the firms relocated to specified less developed areas for salaries of new local employment
- Subsidies to the firms relocated to specified less developed areas for moving expenses of the employees who came with them.

(3) Recommendation and introduction of sub-contracting firms

(4) Discount rates for public utilities

- Electricity

(5) Loan programs are provided by the following institutions.

- Regional Development Promotion Corporation (public corporation)
- Japan Development Bank
- Hokkaido and Tohoku Development Public Finance Corporation
- Small and Medium Scale Industries Public Finance Corporation
- Citizens Public Finance Corporation
- Okinawa Development Public Finance Corporation
- Agricultural and Forestry Central Public Finance Corporation
- Commercial and Industrial Cooperatives Central Public Finance Corporation

(6) Other incentive programs provided by provincial governments.

5.1.3. small and medium enterprises

In pursuing relocation of industries, treatment of small and medium enterprises is an important factor to be considered. The small and medium enterprises have less freedom in choosing their location than larger firms. Their market is relatively limited. They depend on urban facilities of road, water, waste treatment, and even restaurants which they do not have on their own. They moved to outer areas of the cities where land was less expensive, but as the economy grew rapidly, these areas became urbanized and formerly agricultural areas turned into new urban residential areas. These enterprises were surrounded by residential houses.

The promotion of small and medium enterprises has been an important government policy. The measures to achieve this policy are called 'rationalization' and consist of several components. Those related to relocation of the enterprises are formation of cooperatives, industrial apartments, and industrial estates for specific sub-sectors. The government provides financial assistance such as loans in encouraging these activities for acquisition of land, setting up buildings, and purchasing production and environmental facilities.

5.2. Other countries

Exhibit 5 shows a number of measures among OECD countries in trying to induce development of industries in selected regions for more equal inter-regional distribution of industrial activities. The prevalence of various measures is impressive. The tendency of concentration of industries seems to be universal if the industrial sector is left alone for their locational decisions. Each country has made great efforts and spent considerable public financial resources in coping with this issue. In this report, we would briefly explain the French case.

After World War II, Paris, which occupies only 2% of France's land area, had 20% of the population, and a heavy concentration of political, industrial, commercial, and cultural activity. In rural areas, especially in the West, population decreased rapidly and inter-regional imbalance of income posed a serious problem. In order to cope with this situation, the government adopted a policy in 1954; 1) to discourage further expansion of population and industrial activities in Paris and create employment opportunities in regional areas, 2) to develop non-agricultural activity in the Western Region and raise agricultural productivity; 3) to develop Eastern and Northern

Regions so as to stem an outflow of workers from declining industries such as mining, steel, and textiles.

The government introduced offices and factories under special taxation and required permission for industries wishing to locate in the Paris District. For those industries locating in regional areas, they provided subsidies up to 25% of investment. When factories were relocating their factories from Paris to regional areas, they could receive 50% subsidies for their relocation-related expenses, 100% for the workers' relocation expenses, and the local tax for the factories were reduced. Special rate loans, accelerated depreciation for the buildings, and exemption of registration tax were also provided. As the result, from 1955 to 1975, 5% of the industrial population decreased in Paris and increased in the Western Region.

Exhibit 5; Forms of Aid Available for Regions Selected for Development

	Austra- lia	Austria	Bel- gium	Canada	Den- mark	Fin- land	France	Ger- many	Ire- land	Italy	Nor- way	Nether- lands	Spain	Sweden	Turkey	U.K.	U.S.
a) Investment Grants for:																	
- machinery and equipment		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
- industrial buildings		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
b) Factory buildings	✓	✓			✓	✓	✓	✓	✓	✓	✓			✓			✓
c) Industrial land and sites	✓	✓	✓				✓	✓	✓	✓	✓		✓		✓		✓
d) Loans:																	
- at market rate	✓					✓	✓		✓		✓				✓		✓
- at subsidised rate	✓	✓	✓		✓		✓	✓	✓	✓		✓	✓	✓	✓		✓
- guaranteed	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
e) Fiscal concessions:																	
- on investment			✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓		
- on profits			✓			✓		✓	✓	✓	✓						
- on investment aid received from State		✓	✓				✓	✓		✓	✓					✓	
- on State charges, local taxes, licence fees, etc.	✓	✓	✓			✓	✓		✓	✓	✓		✓		✓	✓	
f) Grants towards labor costs		✓		✓		✓								✓			✓
g) Grants towards employment costs, i.e., social security costs		✓				✓				✓							
h) Assistance towards operating costs										✓							✓
i) Assistance towards moving and settling-in costs of the firm	✓		✓		✓		✓			✓	✓	✓		✓		✓	
j) Aids for manpower mobility and re-location	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓		✓		✓	
k) State shareholding			✓			✓		✓	✓		✓	✓	✓		✓	✓	
l) Transport and other public service concessions	✓					✓		✓			✓			✓	✓		
m) Preferential treatment in the award of Government contracts	✓	✓						✓		✓	✓			✓	✓	✓	
n) Manpower training aids	✓	✓	✓		✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	
o) Other						✓			✓		✓	✓	✓	✓	✓	✓	✓

Source; OECD, 'Report on the Role of Industrial Incentives in Regional Development', 1979.

6. Recommended Relocation Program for Bangkok

6.1. Changing negative to positive approach

Instead of relocating 'polluters', present urban industries should be modernized and expanded at more appropriate locations. The negative approach of punishing the polluters is more of an old type of approach when the public sector watches over the activities of the private sector with suspicious eyes. Under this kind of approach, the private sector will not trust the government. Thailand should take more of a cooperative approach between the public and the private sectors in developing her industrial sector and economy.

Therefore, instead of a relocation program of polluters, it should be called 'Urban Industry Modernization Program'. The program should be for modernization of urban industries because the industries in Bangkok and vicinity will have chances of expanding their factories and upgrading technologies when they move to new locations.

6.2. Setting up clear objectives and targets

(1) objectives

The objectives of the program should be the following:

- 1) Upgrading urban industry.
- 2) Finding places for expansion.
- 3) Reducing congestion.
- 4) Reducing industrial pollution in urban areas.
- 5) Creating jobs in outside areas of BMA.
- 6) Rationalizing land use and function of BMA.

(2) setting up medium and long term targets

It is essential to officially determine targets if the program is to be implemented effectively. A TDRI study proposed the following plan (Exhibit 6) for the reduction of urban manufacturing employment. This proposal can be one alternative of the target. We would like to elaborate on one example in calculating the size of the total land space needed for the program.

Exhibit 6: TDRI Proposal for Urban Manufacturing Employment

Year	1990	1995	2000
Number of workers in BMA (1,000)	980	917	808
Share of BMA (%)	26	20	15

Source: TDRI, 'National Urban Development Policy Framework, Vol. 1, Study Area 2', 1991.

According to this proposal, 172,000 manufacturing workers must be reduced in net from BMA between 1990 to 2000. In order to achieve this goal, about 400-500 hectares of industrial estate land will be needed.

- Number of manufacturing workers per rai; 13 workers (based on the estimate in the Upper Central Regional Development Plan)
- This figure should be multiplied by the factor of 5 as the target industries are smaller, being more labor intensive, and more urban type of industries; $13 \times 5 = 65$ workers/rai
- Areas in rai needed for 172,000 workers;
 $172,000 / 65 = 2,646$ rai
- Conversion to hectares; $2,646 \times 0.16 = 423$ ha

(3) target areas

All the firms currently located in the urbanized areas of BMA should be candidates for relocation. Not all the areas of BMA are urbanized even at this moment. So, it makes sense to differentiate urbanized BMA and unurbanized BMA. The former should be the area where the firms are encouraged to move out and the latter be one of the places for destination of these firms.

Relocation zones (destination):

- Unurbanized BMA; In some cases, relocation to unurbanized BMA should be allowed in which the objective should be rationalization of functions.
- Inner Ring; Most cases.
- Outer Ring; Some cases.
- Other regions; A few cases.

(4) targeted industries

All industries in the targeted zone, i.e. urbanized BMA, willing to move should be included in this program for relocation to zones a to d. The following are some examples of targeted industries

1. Market-oriented/urban industry

- printing/publishing, apparel, food production/services, jewelry

2. Industries which are dependent upon sea port and airport.

- sea port ; metal, machinery
- airport; precision and high-tech electronics industry.

3. Footloose and skilled labor-oriented

- electronics, transportation, precision machinery.

4. Footloose/unskilled labor-oriented

- apparel, jewelry, plastic, rubber, etc.

5. Supporting industries for 3 and 4

- Mainly for production of electronics and machinery parts & components. Most of the supporting industries must be located near parent companies/customers.

Expected relationship between industry and possible location are the following:

Industries Zone	1	2	3	4	5
Zone a(rationalization)	√				√
Zone b	√	√	√	√	√
Zone c		√	√	√	√
Zone d		√	√	√	

In the above chart, 'rationalization' is applicable only for those small and medium enterprises which are limited in locational choices in continuing their business. They are 'rationalized' by locating in industrial estates specially designed for specific industries with common facilities such as pollution control.

7. Necessary Measures

In order to achieve the above objectives, the following actions are necessary:

(According to our survey, firms are interested in measures such as below-market land prices (72.2%), low interest loans (37.4%), and tax incentives (35.4%).)

(1) physical development

Physical industrial estate development in zones a and b should be done by IEAT. The government should provide the necessary budget for this purpose. In zones c and d, either existing industrial estates should be expanded or new industrial estates should be developed for relocation.

(2) financial/tax incentives

Financial and tax incentives should be provided for relocation and promotion of small and medium size firms. The following incentives can be provided:

- BOI incentives; To be provided progressively as they go to outer zones. The present incentive structure should be reviewed for this purpose.
- IFCT/SIFCT special loan; In order to make sure that small and medium size firms are targeted, SIFCT as well as IFCT should provide funding. It is also good to have some kind of competition, avoiding monopoly in this function.

(3) technical assistance

- For the purpose of upgrading technology, consulting services and training services should be provided.
- Information dissemination of new technologies and investment opportunities should be provided.

(4) implementation of pollution control

In addition to providing the above incentives for promotion of the industries, implementation of pollution control is essential to make sure the urban environment is well maintained. The government should impose more strict penalties for violation of environmental regulations.

8. Institutional Arrangement

We would like to recommend the following institutional arrangement for the program:

1. Steering committee; NESDB, DIP, DIW, IEAT, BOI, IFCT, SIFCT, BMA.
2. Secretariat & coordination; IEAT.
3. Enactment of a new law; Urban Industry Modernization Act.

The enactment of this new law is necessary because it is essential for the success of the program to obtain support of a variety of institutions in both the public and private sectors. As mentioned before, this program covers a variety of issues with overlapping responsibilities of various government ministries and agencies.

9. Recommended Physical Development Strategy

Besides the incentive package and regulation, physical development of industrial estates is crucial for successful implementation of the program. The following points should be considered:

- (1) The estates should be built in convenient locations for operation of relocating industries.
- (2) Necessary infrastructure must be made available including water treatment facilities.
- (3) Cost of the land should be kept at a reasonable level, i.e. below the market price, in order to encourage relocation of small and medium firms.

In order to satisfy these points, actual development could be as follows:

- Option 1: Developing on government land provided by Treasury Department, Ministry of Finance, as the Relocation Committee is considering.
- Option 2: Allowing existing industrial estates to expand in the BMA and the Inner Ring strictly for this relocation program.

It is important to have several locations, since relocating industries are likely to have various requirements. (Our survey confirms the variety of location needs among firms. The reasons for their present locations, aside from the answer that the land was owned from the beginning, were proximity to customers (31.3%) and suppliers (20.3%).)

New industrial estates for this purpose and expansion of existing industrial estates together, should number at least 4-5 and if possible, 7-8 sites totaling 2,500-3,000 rai for the years from 1992 to 2000.

Appendix

I Analysis of survey

1. About the survey

As explained in previous sections, including the views of firms which may be involved is essential to the success of the relocation program.

This survey was an attempt to understand firms located in Bangkok and vicinity. We intended to find out about locational intentions of the firms. Thanks to the cooperation of the Department of Industrial Promotion, we have conducted a brief survey of how some managers are thinking on the location of their factories. We would like to express our deep appreciation to DIP.

2. Sample firms

The survey forms were sent to firms in the following sub-sectors:

- (1) slaughter house
- (2) canned food industry
- (3) animal feed industry
- (4) textile industry
- (5) metal industry
- (6) members of Federation of Thai Industries
- (7) others

We sent 451 questionnaires and received 99 answers. The response rate was better than our expectation, which may show interest in these companies' interest on this subject.

3. Survey result

The following are the results of the survey:

- (1) 40.4% of the firms who sent back the questionnaires said that they are planning to move their factories in the future. 35.4% said that it depends on the conditions but 46.5% said they are not planning any move. When we add the percentages of the firms that answered 'Yes.' and 'It depends.', it becomes 75.8%. It means that three fourths of the firms showed some kind of interest in moving their factories.
- (2) Of the 40 firms that said they are planning to move, 12 said 'Within 3 years.' (30.0%), 11 said 'In 3 to 5 years.' (27.5%), and 15 said 'In more than 5 years.' (37.5%). Within 5 years, 26 firms, which amounts to 57.5%, are planning to move.
- (3) Concerning major reasons for their moves, the biggest reason is the difficulty in finding land at existing location due to expanding business but high price of land. 52.5% mentioned this reason. So, more than half of the firms said that even when they try to expand business, they cannot because the land price is too high at their present locations.
- (4) The second reason for their moves was traffic congestion. 23.2% mentioned this reason.
- (5) As for the important reasons for their present locations, the largest number said that the land was owned from the beginning (36 firms, 36.4%). The second was that they are close to customers (31

firms, 31.3%). The third was that they are close to suppliers (20 firms, 20.2%).

(6) About the possible distance where they can move, 'Within 20 km' had the largest number at 25 firms (25.3%). The second was 'Within 30 to 50 km.' with 16 firms (16.2%) and the third 'Within 20 to 30 km.' with 14 firms (14.1%). 'Outside the present province within 50 to 70 km' had 13 firms, which is 13.1%.

(7) The incentives that they are interested in are;

i)	Lower-than-market land price. -----	72 (72.7%)
ii)	Low interest loans. -----	37 (37.4%)
iii)	Tax incentives. -----	35 (35.4%)
iv)	Technical assistance. -----	14 (14.1%)
v)	Training facilities. -----	11 (11.1%)

(8) About the size of land they wish to obtain, the average size varied much depending on sub-sectors. The largest average was 52 rai for FTI members and the smallest was 7 rai for canned food industry. The overall average was 21.8 rai.

Answers to Questionnaires

1992.6.10.

	A	B	C	D	E	G	H	Total
4 <u>Are there any plan in the future to move your factories to another place?</u>								
() Yes. If yes, when?		2	2	15	12	2	7	40
() Within 3 years		2	1	3	4	1	1	12
() In 3 to 5 years.				5	3	1	2	11
() In more than 5 years.			1	6	6		2	15
() No.			4	22	10	5	5	46
() It depends on the conditions.	1		1	19	5	2	7	35
	1	2	7	43	23	8	15	99

5 <u>If so, what are the major reasons for your move?</u>								
() Difficult to find land at existing location (due to expanding business but high price of land).	1		2	18	15	4	12	52
() Opinions of people around.			2	2	4		3	11
() Difficult to find good workers here.	1			9	1		3	14
() Difficult to meet environmental standard.				6	7		1	14
() Traffic congestion.			2	10	5	1	5	23
() others (Please specify.)		2	2	9	5	2	4	24
	1	2	7	43	23	7	15	99

6 <u>What are the important reasons for choosing for your present location?</u>								
() Land was owned from the beginning .	1	1	3	16	7	2	6	36
() Close to the houses of the owners.		1		8	4	1	2	16
() Close to the houses of the workers.		1		5	7	1	3	17
() Close to the suppliers.			1	5	5	2	7	20
() Close to the customers.		1	2	10	8	3	7	31
() Others. (Please specify.)	1	1	2	15	10	5	8	42
	1	2	7	43	23	8	15	99

7 <u>To where is it possible for you to move?</u>								
() Within 20 km.		1		14	6	1	3	25
() Within 20 to 30 km.				7	3		4	14
() Within 30 to 50 km.		1	2	5	4		4	16
() Outside the present province within 50 to 70 km.			2	3	5	2	1	13
() Elsewhere. (Please specify.)	1		1	6	5	3	4	20
	1	2	5	35	23	6	15	99

8 <u>If the government is willing to build industrial estates fully equipped with utilities and waste treatment facilities in the suburbs of Bangkok , say, within 30 to 40 km from the center, for your factories to move in, what kind of incentives will you be interested in?</u>								
() Land provided at lower than market price.	1	1	6	29	19	4	12	72
() Low interest loan for moving, installing new equipments, etc.			3	14	12	1	7	37
() Training facilities for workers.				5	3		3	11
() Technical assistance to upgrade your technology.				7	3		4	14
() Tax incentives.	1	1	2	12	11	2	6	35
() others (Please specify.			1	7	6	2	4	20
	1	2	7	43	23	8	15	99

9 <u>In a case of relocating your business, how large land do you wish to obtain? (rais)</u>								
(Average)	40.0	7.0	25.8	11.1	26.2	52.0	32.0	21.8

Received	1	2	7	43	23	8	15	99
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(Sent)	28	14	13	260	61	25	50	451
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	A	B	C	D	E	G	H	Total
4 Are there any plan in the future to move your factories to another place?								
() Yes. If yes, when?	0.0%	100.0%	28.6%	34.9%	52.2%	25.0%	46.7%	40.4%
() Within 3 years.	0.0%	100.0%	14.3%	7.0%	17.4%	12.5%	6.7%	12.1%
() In 3 to 5 years.	0.0%	0.0%	0.0%	11.6%	13.0%	12.5%	13.3%	11.1%
() In more than 5 years.	0.0%	0.0%	14.3%	14.0%	26.1%	0.0%	13.3%	15.2%
() No.	0.0%	0.0%	57.1%	51.2%	43.5%	62.5%	33.3%	46.5%
() It depends on the conditions.	100.0%	0.0%	14.3%	44.2%	21.7%	25.0%	46.7%	35.4%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
5 If so, what are the major reasons for your move?								
() Difficult to find land at existing location (due to expanding business but high price of land).	100.0%	0.0%	28.6%	41.9%	65.2%	57.1%	80.0%	52.5%
() Opinions of people around.	0.0%	0.0%	28.6%	4.7%	17.4%	0.0%	20.0%	11.1%
() Difficult to find good workers here.	100.0%	0.0%	0.0%	20.9%	4.3%	0.0%	20.0%	14.1%
() Difficult to meet environmental standard.	0.0%	0.0%	0.0%	14.0%	30.4%	0.0%	6.7%	14.1%
() Traffic congestion.	0.0%	0.0%	28.6%	23.3%	21.7%	14.3%	33.3%	23.2%
() others (Please specify.)	0.0%	100.0%	28.6%	20.9%	21.7%	28.6%	26.7%	24.2%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
6 What are the important reasons for choosing for your present location?								
() Land was owned from the beginning.	100.0%	50.0%	42.9%	37.2%	30.4%	25.0%	40.0%	36.4%
() Close to the houses of the owners.	0.0%	50.0%	0.0%	18.6%	17.4%	12.5%	13.3%	16.2%
() Close to the houses of the workers.	0.0%	50.0%	0.0%	11.6%	30.4%	12.5%	20.0%	17.2%
() Close to the suppliers	0.0%	0.0%	14.3%	11.6%	21.7%	25.0%	46.7%	20.2%
() Close to the customers.	0.0%	50.0%	28.6%	23.3%	34.8%	37.5%	46.7%	31.3%
() Others. (Please specify.)	100.0%	50.0%	28.6%	34.9%	43.5%	62.5%	53.3%	42.4%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
7 To where is it possible for you to move?								
() Within 20 km.	0.0%	50.0%	0.0%	40.0%	26.1%	16.7%	20.0%	25.3%
() Within 20 to 30 km.	0.0%	0.0%	0.0%	20.0%	13.0%	0.0%	26.7%	14.1%
() Within 30 to 50 km.	0.0%	50.0%	40.0%	14.3%	17.4%	0.0%	26.7%	16.2%
() Outside the present province within 50 to 70 km.	0.0%	0.0%	40.0%	8.6%	21.7%	33.3%	6.7%	13.1%
() Elsewhere. (Please specify.)	100.0%	0.0%	20.0%	17.1%	21.7%	50.0%	26.7%	20.2%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
8 If the government is willing to build industrial estates fully equipped with utilities and waste treatment facilities in the suburbs of Bangkok, say, within 30 to 40 km from the center, for your factories to move in, what kind of incentives will you be interested in?								
() Land provided at lower than market price.	100.0%	50.0%	85.7%	67.4%	82.6%	50.0%	80.0%	72.7%
() Low interest loan for moving, installing new equipments, etc.	0.0%	0.0%	42.9%	32.6%	52.2%	12.5%	46.7%	37.4%
() Training facilities for workers.	0.0%	0.0%	0.0%	11.6%	13.0%	0.0%	20.0%	11.1%
() Technical assistance to upgrade your technology.	0.0%	0.0%	0.0%	16.3%	13.0%	0.0%	26.7%	14.1%
() Tax incentives.	100.0%	50.0%	28.6%	27.9%	47.8%	25.0%	40.0%	35.4%
() others (Please specify.)	0.0%	0.0%	14.3%	16.3%	26.1%	25.0%	26.7%	20.2%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
9 In a case of relocating your business, how large land do you wish to obtain? (raies)								
(Average)	40.0	7.0	25.8	11.1	2.2	52.0	32.0	21.786
Received	1	2	7	43	23	8	15	99
(Sent)	28	14	13	260	61	25	50	451

A	B	C	D	E	G	H	Total
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4 Are there any plan in the future to move your factories to another place?

() Yes. If yes, when?

() Within 3 years.

() In 3 to 5 years.

() In more than 5 years.

() No.

() It depends on the conditions.

0.0%	5.0%	5.0%	37.5%	30.0%	5.0%	17.5%	100.0%
0.0%	16.7%	8.3%	25.0%	33.3%	8.3%	8.3%	100.0%
0.0%	0.0%	0.0%	45.5%	27.3%	9.1%	18.2%	100.0%
0.0%	0.0%	6.7%	40.0%	40.0%	0.0%	13.3%	100.0%
0.0%	0.0%	8.7%	47.8%	21.7%	10.9%	10.9%	100.0%
2.9%	0.0%	2.9%	54.3%	14.3%	5.7%	20.0%	100.0%
1.0%	2.0%	7.1%	43.4%	23.2%	8.1%	15.2%	100.0%

5 If so, what are the major reasons for your move?

() Difficult to find land at existing location

(due to expanding business but high price of land).

() Opinions of people around.

() Difficult to find good workers here.

() Difficult to meet environmental standard.

() Traffic congestion.

() others (Please specify.)

1.9%	0.0%	3.8%	34.6%	28.8%	7.7%	23.1%	100.0%
0.0%	0.0%	18.2%	18.2%	36.4%	0.0%	27.3%	100.0%
7.1%	0.0%	0.0%	64.3%	7.1%	0.0%	21.4%	100.0%
0.0%	0.0%	0.0%	42.9%	50.0%	0.0%	7.1%	100.0%
0.0%	0.0%	8.7%	43.5%	21.7%	4.3%	21.7%	100.0%
0.0%	8.3%	8.3%	37.5%	20.8%	8.3%	16.7%	100.0%
1.0%	2.0%	7.1%	43.4%	23.2%	7.1%	15.2%	100.0%

6 What are the important reasons for choosing for your present location?

() Land was owned from the beginning.

() Close to the houses of the owners.

() Close to the houses of the workers.

() Close to the suppliers.

() Close to the customers.

() Others. (Please specify.)

2.8%	2.8%	8.3%	44.4%	19.4%	5.6%	16.7%	100.0%
0.0%	6.3%	0.0%	50.0%	25.0%	6.3%	12.5%	100.0%
0.0%	5.9%	0.0%	29.4%	41.2%	5.9%	17.6%	100.0%
0.0%	0.0%	5.0%	25.0%	25.0%	10.0%	35.0%	100.0%
0.0%	3.2%	6.5%	32.3%	25.8%	9.7%	22.6%	100.0%
2.4%	2.4%	4.8%	35.7%	23.8%	11.9%	19.0%	100.0%
1.0%	2.0%	7.1%	43.4%	23.2%	8.1%	15.2%	100.0%

7 To where is it possible for you to move?

() Within 20 km.

() Within 20 to 30 km.

() Within 30 to 50 km.

() Outside the present province within 50 to 70 km.

() Elsewhere. (Please specify.)

0.0%	4.0%	0.0%	56.0%	24.0%	4.0%	12.0%	100.0%
0.0%	0.0%	0.0%	50.0%	21.4%	0.0%	28.6%	100.0%
0.0%	6.3%	12.5%	31.3%	25.0%	0.0%	25.0%	100.0%
0.0%	0.0%	15.4%	23.1%	38.5%	15.4%	7.7%	100.0%
5.0%	0.0%	5.0%	30.0%	25.0%	15.0%	20.0%	100.0%
1.0%	2.0%	5.1%	35.4%	23.2%	6.1%	15.2%	100.0%

8 If the government is willing to build industrial estates fully equipped with utilities and waste treatment facilities in the suburbs of Bangkok, say, within 30 to 40 km from the center, for your factories to move in, what kind of incentives will you be interested in?

() Land provided at lower than market price.

() Low interest loan for moving, installing new equipments, etc.

() Training facilities for workers.

() Technical assistance to upgrade your technology.

() Tax incentives.

() others (Please specify.)

1.4%	1.4%	8.3%	40.3%	26.4%	5.6%	16.7%	100.0%
0.0%	0.0%	8.1%	37.8%	32.4%	2.7%	18.9%	100.0%
0.0%	0.0%	0.0%	45.5%	27.3%	0.0%	27.3%	100.0%
0.0%	0.0%	0.0%	50.0%	21.4%	0.0%	28.6%	100.0%
2.9%	2.9%	5.7%	34.3%	31.4%	5.7%	17.1%	100.0%
0.0%	0.0%	5.0%	35.0%	30.0%	10.0%	20.0%	100.0%
1.0%	2.0%	7.1%	43.4%	23.2%	8.1%	15.2%	100.0%

9 In a case of relocating your business, how large land do you wish to obtain? (raisi)

(Average)	40.0	7.0	25.8	11.1	26.2	52.0	32.0	21.786
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Received	1	2	7	43	23	8	15	99
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(Sent)	28	14	13	260	61	25	50	451
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Questionnaire

The purpose of our survey is to find out how to best serve your needs in conducting your present business and for your continued prosperity in the future.

1. The type of business you are in. ()
2. Number of workers. ()
3. Existing land size. ()

* In the following questions, you may choose two or more items if applicable.

4. Are there any plan in the future to move your factories to another place?

- Yes. If yes, when?
 Within 3 years.
 In 3 to 5 years.
 In more than 5 years.

- No.
 It depends on the conditions.

5. If so, what are the major reasons for your move?

- Difficult to find land at existing location (due to expanding business but high price of land).
 Opinions of people around.
 Difficult to find good workers here.
 Difficult to meet environmental standard.
 Traffic congestion.
 others (Please specify.)

6. What are the important reasons for choosing for your present location?

- Land was owned from the beginning.
 Close to the houses of the owners.
 Close to the houses of the workers.
 Close to the suppliers.
 Close to the customers.
 Others. (Please specify.)

7. To where is it possible for you to move?

- Within 20 km.
 Within 20 to 30 km.
 Within 30 to 50 km.
 Outside of the present province within 50 to 70 km.
 Elsewhere. (Please specify.)

8. If the government is willing to build industrial estates fully equipped with utilities and waste treatment facilities in the suburbs of Bangkok, say, within 30 to 40 km from the center, for your factories to move in, what kind of incentives will you be interested in? For this question only, please choose two answers at maximum.

- Land provided at lower than market price.
 Low interest loan for moving, installing new equipments, etc.
 Training facilities for workers.
 Technical assistance to upgrade your technology.
 Tax incentives.
 others (Please specify.)

9. In a case of relocating your business, how large land do you wish to obtain? (rai)

Thank you very much for your kind cooperation.

Descriptive Answers to Questionnaires

4. Are there any plan in the future to move your factories to another place?

- No. Because there is no pollution coming from our plant. (H)
- If the cost of land is really lower than the existing one and equipped with facilities. (H)

5. If so, what are the major reasons for your move?

- To expand the business. (B)
- The size of present plant is not large enough for the production capacity. (B)
- The contract is due. (B)
- Need the appropriate area for running the livestock. (C)
- Convenient to transport. (D)
- Flood. (D)
- If the government force the factory having to move. (D)
- In order that the new plant will have a better system than the old plant. (D)
- Expand the business. (D)
- Close to the customer. (D)
- Rent the land and want to own a new land. (D)
- The rent fee is increased every year. (D)
- Presently the plant is rent. (D)
- Expanding the business and setting the working system to be more efficient. (D)
- Expand the business. (D)
- Considering the tax for buildings and land, etc. (D)
- Infrastructure provided. (E)
- Land cost of present plant is too high to be the location of plant. (E)
- Cost of land must be not too high. The foundry plant need large areas. (E)
- Expand the business. (E)
- Rent the land before moving. (E)
- Already moved. (E)
- Close to the customers in order to save the transportation cost. (G)
- Move to export zone because of tax incentives. (G)
- Close to raw materials. (H)
- Because of working in closed building. (H)
- If the cost of land is really lower than the existing one and equipped with facilities. (H)
- Lack of infrastructure. (H)
- Close to raw materials. (H)

6. What are the important reasons for choosing for your present location?

- Located in the suburb area. (A)
- Convenient to transport. (B)
- Low rent fee. (B)
- The product can be transported to the whole country. (C)
- In the past, our location was suburb area. (C)
- Low land cost and easy to get the workers. (D)
- Takeover from the beginning owner. (D)
- In the past, cost of land is low but the land is far from the business center. Presently, its location is appropriate to do business. (D)
- The location is appropriate in several aspects. (D)
- It is possible to get the workers. (D)
- Cost of land is quite low. (D)
- Located in the textile industry area. Easy to get the workers. (D)
- Lent from the beginning owner. (D)
- Took over the business from the beginning owner. (D)
- Moved from Bangkok to provincial area. (D)
- Close to the customer, convenient to transport, and easy to find the workers. (D)
- Depend on cost of the land and transportation. (D)
- It is the area of textile industries. So it is easy to get the workers. (D)
- Located in the industrial estate area. (D)
- Located in the Bangplee Industrial Estate. (D)
- Located in the industrial estate area. (E)
- Located in the Bangplee Industrial Estate. (F)
- Providing infrastructure including waste water treatment services. (E)
- Infrastructure fully provided. (E)
- Located in the area of foundry plant. (E)
- Most of the customers are in Bangkok. (E)
- Just moved the plant. (E)
- Located near the other plant of company and there is all facilities. (E)
- Land price has to be low because the value-added of our products is low, we need a large space, and our sales is not stable. (E)
- Not more than 100 km from Bangkok and depend on cost of land. (E)
- Turn key plant. (E)
- Suitable location and sufficient infrastructure. (G)
- Low land cost. (G)
- Located near the old factory. (G)
- Located in Navanakorn Industrial Estate. (G)
- Located in the area of same industries. (G)
- Lent the land. (H)
- Low land cost in the past (15 - 20 years ago). (H)
- Can get the land at low price. (H)
- Close to raw material. (H)
- The factory was founded in 1969 while it was a suitable location.
- Infrastructure provided such as water, electricity, telephone. (H)
- It is the small industry center and there is no problem with environment. (H)

- Close to raw materials or in the property owned by the group companies. (H)

7. To where is it possible for you to move?

- Expanding the branch factory to provincial area which quite fully equipped with facilities. (A)
- Within 100-200 km from Bangkok. (C)
- Move to suburb areas. (D)
- If there is no problem concerning transportation and infrastructure, it is possible to move within 100 - 200 km. (D)
- Expand to the land which is near the existing plant. (D)
- Depend on the land we can get whether it is near or far.
- No idea regarding to moving the plant. (E)
- Nakom Pathom Province. (E)
- It is not certain. (E)
- 50 - 150 km from Bangkok. (G)
- Do not want to move the factory. (G)
- Move to export zone. (G)
- Ratchaburi Province. (H)
- No plan to move the factory but for increasing production capacity, the company has to set up a new factory which is close to raw materials. (H)
- Within 100 - 150 km from Bangkok. (H)
- Close to raw materials or where fully equipped with infrastructure. (H)

8. If the government is willing to build industrial estates fully equipped with utilities and waste treatment facilities in the suburbs of Bangkok, say, within 30 to 40 km from the center, for your factories to move in, what kind of incentives will you be interested in? For this question only, please choose two answers at maximum.

- Need the appropriate surroundings for operating livestock. (C)
- If the government force the factory to move. (D)
- Providing infrastructure. (D)
- The industrial estate is located in the suburb and provide with waste treatment facilities. (D)
- If there is enough capital to invest. (D)
- Fully equipped with infrastructure. (D)
- Require the workers. (D)
- It is impossible that all bleaching plant will move to our place. (D)
- The owner is willing to move if the industrial estates are built within 20 - 30 km from the center. (D)
- Depend on investment capital and marketing capabilities of the company.
- Low land cost and convenient location. (D)
- Financial source. (D)
- Low land cost and convenient location. (E)
- Financial source. (E)
- In order that people around will not complain concerning the pollution from the foundry. (E)
- Infrastructure provided including waste treatment facilities. (E)

- Close to the customer and distributor. (E)
- Who will take care of the construction expenses of the old factory?
(E)
- Providing waste treatment facilities. (E)
- Fully equipped with infrastructure. (G)
- The government should arrange the industrial estates that provide the land for leasing for 15 - 20 years by the entrepreneurs who will pay 15 - 30 % of the total cost for down payment and pay the rest by installments. Furthermore, the government should give them incentives, i.e. low interest loan (about -7%), tax incentives (10% less than regular tax rate). (H)
- The industrial estate must be located near the raw materials. (H)
- Now BOI supports paper pulp producing only in the promotional zone 2 and 3, total 57 provinces. Paper pulp industry has to use a lot of water and releases many waste water. This industry should be located near the raw materials than customers. (H)
- Must have enough telephone lines and no problem with traffic congestion. (H)
- Close to the customers. (H)

II Kanazawa Industrial Complex Project

The Kanazawa Industrial Complex Project is one of the most successful cases of industrial relocation schemes in Japan. The Complex is located about 12 kilometers to the south from the center of Yokohama City. The project was planned and implemented by Yokohama City Municipal Government.

It is a large urban development project with three main objectives:

(1) Redevelopment of Urban District

Industrial plants facing locational problems in urban districts were invited to the Kanazawa Industrial Complex so that redevelopment of the evacuated land could be promoted and an effective use of city center land could be realized.

(2) Promotion of Small and Medium Scale Industries

Relocation to the Kanazawa Industrial Complex gave enterprises an opportunity to improve their plants and equipments and rationalize their management through grouping or cooperative operation.

(3) New Urban Development

It was aimed at creating an 'ideal' environment for industrial sector where rational location of industries would be realized and various urban functions would be properly integrated.

The size of the area for the project and the land use are as follows:

Exhibit 1: Land Use of Kanazawa Industrial Complex

	Land Use	Area (ha)
1	Industrial Use	258
2	Housing Use	82
3	Public Use (*)	318
	Total	658

* "Public Use" includes the following areas.

- 1) Public Facilities
- 2) Parks and green zones
- 3) Trunk roads
- 4) Zone streets, Sewage beds, etc.
- 5) Roads for bicycles and pedestrians
- 6) School

As shown in this exhibit, the Complex is a large-scale project. It has many functions, not only industrial use but also parks, schools, and other public facilities such as joint treatment plants, cooperatives buildings, etc. These other facilities make the complex very attractive especially for small

and medium firms since they cannot build them on their own. It is important to note that it is people who work at the factories, many functions other than production facilities are nice to have in the vicinity. It also enhances the image of the project among citizens living in the surrounding areas. They also share the benefits by being able to use facilities such as parks and schools.

The Complex currently has about two hundred firms which have relocated themselves from other districts of Yokohama City. The composition of the firms by the sub-sectors are as the followings:

Exhibit 2: Breakdown of Enterprises by Type of Business

	Type of Business	Percentage
1	Machinery	27.2%
2	Metals	19.5%
3	Construction	15.4%
4	Raw materials	5.9%
5	Foodstuff	6.2%
6	Recycle resources	5.4%
7	Service	5.1%
8	Printing	3.6%
9	Wooden furniture	2.8%
10	Textile	3.1%
11	Ceramics	1.3%
12	Others	4.5%
	Total	100.0%

As can be seen, it has a variety of businesses, which makes the complex all the more attractive for locating companies. It is not just polluting industries which moved to this complex. Many other businesses such as resource recycling, construction, and distribution are also located in the complex. This factor is important in two ways. For one, it is advantageous for firms to be able to create linkage among different industries. For another, it makes the complex more attractive since it is not just for 'polluting firms'.

The following is the brief history of the development of the Kanazawa Industrial Complex:

Exhibit 3: Brief History of Kanazawa Industrial Complex Project

- | | |
|------------|---|
| May 1966 | Kanazawa land reclamation project drafted as a part of overall plan to upgrade international city of Yokohama. |
| July 1968 | Land reclamation project approved by Yokohama city Assembly. (area = 6.6 million square meters) |
| July 1969 | Survey made of enterprises to check those wishing for relocation. Out of all the 5,899 industrial plants in the city, 830 wished to relocate. |
| Dec. 1971 | Questionnaire survey made of industrial plants wishing to relocate. (560 wished to relocate.) |
| Sept. 1973 | Decision made on measures to dispose of industrial waste water in Kanazawa reclaimed land. |
| Mar. 1974 | Survey made of industrial plants wishing for relocation. (515 wished to relocate.) |
| July 1975 | Survey made of enterprises wishing to have apartments for their employees. (Out of 157 surveyed with 20 or fewer employees, 76 wished plant apartments.) |
| Dec. 1975 | Survey made of industrial plants wishing to relocate. (944 wished to relocate.) |
| Feb. 1976 | Reception of application from enterprises for relocation to No.1 tract (Kanazawa Timber Center). |
| Apr. 1976 | Decision made on basic policy concerning purchase and application of land evacuated by enterprises moving to Kanazawa reclaimed land. |
| July 1976 | Survey. |
| Mar. 1977 | Reception of application from enterprises for relocation to No.2 tract (Kanazawa Distribution Complex). |
| Apr. 1977 | Registration of enterprises wishing to relocate. (497 registered.) |
| Sept 1977 | Overall explanation session held for registered enterprises wishing to relocate. |
| Oct. 1977 | Council met for selection of enterprises to move to industrial complex in Kanazawa reclaimed land. (Council met four times by May 1983 And decided on enterprises to move to No.2 tract.) |
| Nov. 1977 | Explanation session by business type held for registered enterprises wishing to relocate. |
| Dec. 1977 | Agreement concluded on coordinated implementation by prefectural and municipal governments of small-and-medium enterprises advancement fund aid system. |
| May 1978 | Interview survey made of financial conditions of registered enterprises wishing to relocate. |
| Apr. 1979 | Hearing for introduction of funds from Pollution Prevention Public Corporation. |
| Sept 1979 | Reception of application from enterprises for relocation. (No.3 tract) |

Oct. 1979	Cooperative association by business type established of enterprises wishing to relocate.
Nov. 1979	Outline prepared of facilities for joint use by industrial plants introducing promotion funds. (Three industrial associations for joint use of facilities.)
Sept 1980	Construction started of plant waste water pre-treatment station.
Feb. 1981	Explanatory meeting held for enterprises selected for relocation.
May 1981	Explanatory meeting held for enterprises moving to Kanazawa Industrial Complex.
Aug. 1981	Cooperative association inaugural ceremonies held.
Nov. 1981	Ceremony held for the start of construction of Yokohama City Kanazawa Promotional Center.
Dec. 1981	Kanazawa Industrial Complex construction agreement approved.
Mar. 1982	Industrial waste water pre-treatment station completed.
May 1982	Bylaws abolished for council to select enterprises to move to the complex.

Please note that surveys of enterprises were held many times in order to understand the actual demand and needs for relocation. The survey also functioned as a means of promotion activities at the same time. As the project size was very large and it included land reclamation, it took more than ten years to complete. But even if they were to have the project without the land reclamation part, it would have taken a long time for the city to see the demand and needs of enterprises and persuade them to relocate. As a result, these enterprises went through a series of relocation procedures which must have been difficult without the cooperation of both central and local governments.

The features of the Kanazawa Project that are relevant to the current relocation plan in Thailand are:

- (1) It emphasizes on the promotion of small and medium scale industries.
- (2) It has many functions. Residential and recreation facilities development are included as well as industrial development.
- (3) It covers a variety of firms in industrial sector as well as commercial and service sectors.
- (4) Intensive surveys of target firms concerning their opinions on relocation have been conducted several times. The plan has been adjusted based on these surveys.
- (5) It was prestigious for the firms to move into this Complex. The prestige was going to bring tangible benefits for the firms such as bank loans and employment.

As urbanization progressed in Yokohama City, the urban areas gradually spread to the outer regions. The factories which had been located in the middle of the agricultural areas became surrounded by houses. At the same time the local residents began to be more aware of the industrial pollution, which previously had been given little attention, or even considered as a sign of progress or development. Local governments received more and more complaints and the firms operating in the middle of densely populated areas felt pressure from the people living around them. Some firms which were succeeding in business were not able to expand their operations because of the spatial constraints. It was becoming more and more difficult for these small and medium scale industries which were limited in financial and technical capabilities to continue their operations. The project provided a good opportunity for them to solve their problems.

This project was well planned but adjusted to these real needs of the society and the firms as the project made progress. The needs were carefully assessed by a number of surveys.

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